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General Plan Update

Appendix L:

Eastern Municipal Water District Reference Materials

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General Plan Update

Appendix L1:

2005 Urban Water Management Plan

Table of Contents

Table of Contents i

Section 1 - Introduction 1

Urban Water Management Planning Act 1

Public Participation 1

Eastern Municipal Water District 1
Figure 1.1 Areas Within EMWD Boundaries 2
Figure 1.2 - EMWD Sub Agencies 4

Population 5
Table 1.1 - Population Within EMWD's Boundary 5
Figure 1.3 - Population Growth Within EMWD Boundary Population Projections 5

Growth Projections 5
Table 1.2 - Current and Projected Population 6

Climate 6
Table 1.3 - EMWD Climate 7

Other Demographic Factors 7

Section 2 – Water Sources 9

Table 2.1 - Potable Water Supply by Source (AFY) 10
Table 2.2 - Non-Potable Water Supply by Source (AFY) 10
Table 2.3 - Total Water Supply (AFY) 10
Figure 2.1 - Location of Supply Sources 11

Imported Water 12

Groundwater 12

Recycled Water 13

Section 3 - Groundwater 14

Basin Description 14

San Jacinto Watershed - Groundwater Management Zones in EMWD's Service Area 14

Groundwater Management 17

Hemet/San Jacinto Water Management Area 17

History of the Hemet/San Jacinto Basin Water Management Plan 17
Figure 3.1 - Hemet/San Jacinto Water Management Area 18

Water Quality 20
Table 3.1 - TDS and NO_3–N by Management Zone for 2004 20

Water Levels 20
Table 3.2 - Average Changes in Groundwater in Storage, 2003 to 2004 20
Figure 3.2 – Hemet/San Jacinto Water Management Area Water Level Contour Map 21

Water Extraction 22
Figure 3.3 - Monthly Production by Management Zone 22

Operational Yield *22*

Recharge *22*
Figure 3.4 - West San Jacinto Groundwater Basin Management Plan 24

History of the West San Jacinto Groundwater Basin Management Plan *24*

Water Quality *25*

Water Levels *25*
Figure 3.5 – West San Jacinto Basin Water Contour Map 26
Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management Area 27

Desalters *27*

Groundwater Pumping Rights *28*

Past Production *28*
Table 3.4 - Amount of Groundwater Pumped – AFY 28

Projected Production *29*
Table 3.5 - Amount of Groundwater Projected to be Pumped - AFY 29

Section 4 – Reliability of Supply 30

Table 4.1 - Supply Reliability Average Year - AFY 30
Table 4.2 - Supply Reliability Single Dry Year (AFY) 31
Table 4.3 - Multiple Dry Years Supply Reliability (AFY) 32

Imported Water *32*
Table 4.4 – Basis of Water Year Data 33
Table 4.5 – Average Supply Capability & Projected Demands (AFY) 34
Table 4.6 - Dry Year Supply Capability & Projected Demands (AFY) 34
Table 4.7 - Multiple Dry Year Supply Capability & Projected Demands (AFY) 35

Groundwater *36*

Hemet/San Jacinto Area *36*
Figure 4.1: - Annual San Jacinto River Flow 37
Table 4.8 - Normal, Single-Dry, and Multiple-Dry Years 37
Table 4.9 - Results of Hydrologic Reliability Analysis 38

West San Jacinto Groundwater Management Plan Area *38*

Santa Margarita Watershed *39*

Recycled Water *39*

Section 5 - Transfers and Exchanges 40

Section 6 - Water Use by Customer Type 41

Figure 6.1 – Population Growth vs. Water Demand 41

Retail Market Segments *42*
Table 6.1 - Water Use by Customer Type-AFY 42

Retail Sales of Potable Water *42*

Residential *42*

Commercial Sector *43*

Industrial Sector *43*

Institutional/Governmental Sector *43*

Agricultural Sales – Potable Water *43*

Reduction of Retail Demand through Conservation *44*
Table 6.2 – Conservation Savings – AFY 44

Wholesale to Other Agencies *44*
Table 6.3 - Sales to Other Agencies – AFY 45

Other Water Uses *45*
Table 6.4 - Other Water Uses - AFY 45

Recharge Water *45*

Recycled Water *45*

Water Losses *46*

All Use *46*
Table 6.5 - Total Water Use - AFY 46

Section 7 – Conservation 47

Metropolitan Water District of Southern California *47*

Projected Water Savings *47*

California Urban Water Conservation Council *48*

Best Management Practices *48*

Water Survey Programs for Single – Family Residential and Multi-Family Customers *48*

Plumbing Retrofits *48*

Distribution System Water Audits, Leak Detection and Repair *48*

Metering with Commodity Rates *49*

Large Landscape Water Audits and Incentives *49*

High-Efficiency Wash Machine Rebates *49*

Public Information *49*

School Education *49*

Commercial, Industrial, and Institutional Water Conservation *50*

Wholesale Agency Programs *50*

Conservation Pricing *50*

Conservation Coordinator *50*

Water Waste Prohibition *50*

Ultra-Low Flush Toilet Replacements *51*

Demand Management Measures (DMM) *51*

Evaluation of DMMs Not Implemented *51*

Section 8 – Planned Water Supply, Projects and Programs 52

Proposed Supply Projects and Programs 52
Table 8.1 - Future Water Supply Projects -AFY 52
Table 8.2 - Water Supply Projects Timeline 53

Desalters 53

Hemet Microfiltration Plant 53

Perris Microfiltration Plant Expansion 53

Integrated Recharge and Recovery Project 54

Recycled Water 54

San Jacinto Valley Regional Water Reclamation Facility 54

Moreno Valley RWRF 54

Temecula Valley RWRF 54

Perris Valley RWRF Expansion 55

Section 9 – Desalinated Water 56

Table 9.1 - Opportunities for Desalinated Water 56

Section 10 – Wholesale Water 57

Bringing Imported Water to EMWD 57

Member Agencies 57
Figure 10.1 - MWD Member Agencies 58

Board of Directors 59

Planning for the Future 59

Integrated Resources Plan 59
Table 10.1 – IRP Targets 60

Water Surplus and Drought Management Plan 61

Surplus Stages 61

Shortage Stages 62

Severe Shortage Stages 62

EMWD Demand 62
Table 10.2 EMWD Imported Water Demand -AFY 63

Section 11 – Water Shortage Contingency Plan 64

Stages of Action 64
Table 11.1 -Water Shortage Contingency Plan Stages of Action 64

Estimate of Minimum Supply 64
Table 11.2 - Three- Year Estimated Dry Year Supply AFY 65

Catastrophic Supply Interruption 65

Prohibition, Penalties and Consumption Reduction Methods 66

Table 11.3 - Prohibitions 66
Table 11.4 - Consumption Reduction Methods 67
Table 11.5 - Penalties and Charges 68

Analysis of Revenue *68*
Table 11.6 - Actions and Conditions that Impact Revenue 68
Table 11.7 - Actions and Conditions that Impact Expenditures 68
Table 11.8 - Proposed Measures to Overcome Revenue Impacts and Increased Expenditures 68

Section 12 - Water Recycling 69

Planning Coordination *69*
Table 12.1 – Participating Agencies 69

Wastewater Quantity, Quality and Current Uses *70*
Table 12.2 - EMWD Treatment Facilities – AFY 70
Table 12.3 - Wastewater Collected and Treated – AFY 71
Table 12.4 - Disposal of Wastewater (Non-Recycled) – AFY 71
Table 12.5 - Recycled Water Uses – Projected AFY 71

Potential and Projected Use, Optimization Plan with Incentives *71*
Table 12.6 - Recycled Water Use Potential - AFY 71
Table 12.7 - Recycled Water Use – 2000 Projection Compared to 2005 Actual-AFY 72

Methods to Encourage Recycled Water Use *72*

Section 13 - Water Quality Reliability 74

Public Heath Goals *74*

Other Concerns *74*

MWD Water Quality *74*

Table 13.1 – EMWD Present PHG Violations *75*
Table 13.2 – EMWD Potential PHG & MCL Violations 77
Table 13.3 – EMWD Potential PHG & MCL Violations, UCMR 78
Table 13.4 – EMWD Potential PHG & MCL Violations, Contaminant Candidate List (CCL) Chemicals 79

Colorado River *79*

State Water Project *79*

Regional Water Quality *80*

Salinity *80*

Perchlorate *80*

Total Organic Carbon and Bromide *81*

Methyl Tertiary Butyl Ether and Tertiary Butanol *81*

Arsenic *82*

Radon *82*

Uranium *82*

N-nitrosodimethylamine *83*

Hexavalent Chromium *83*

Pharmaceuticals and Personal Care Products *83*

MWD's RUWMP *83*

Section 14 - Water Service Reliability - Normal Water Year 84

Tables 14.1 through 14.3 ..... *84*
Table 14.1 – Projected Normal Water Year Supply – AFY 84
Table 14.2 – Projected Normal Water Year Demand – AFY 84
Table 14.3 – Projected Normal Water Year Supply and Demand Comparison - AFY 84

Section 15 - Water Service Reliability - Single Dry Water Year 85

Tables 15.1 through 15.3 ..... *85*
Table 15.1 – Projected Single Dry Water Year Supply – AFY 85
Table 15.2 – Projected Single Dry Water Year Demand – AFY 85
Table 15.3 – Projected Single Dry Water Year Supply and Demand Comparison – AFY ... 85

Section 16 - Water Service Reliability - Multiple Dry Water Years 86

Tables 16.1 through 16.3 ..... *86*
Table 16.1 – Projected Supply During a Multiple Dry Year Period Year Ending in 2010 - AFY 86
Table 16.2 – Projected Demand During a Multiple Dry Year Period Year Ending in 2010 – AFY 86
Table 16.3 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2010 – AFY 86

Tables 16.4 through 16.6 ..... *86*
Table 16.4 – Projected Supply During a Multiple Dry Year Period Year Ending in 2015 - AFY 86
Table 16.5 – Projected Demand During a Multiple Dry Year Period Year Ending in 2015 – AFY 86
Table 16.6 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2015 – AFY 87

Tables 16.7 through 16.9 ..... *87*
Table 16.7 – Projected Supply During a Multiple Dry Year Period Year Ending in 2020 - AFY 87
Table 16.8 – Projected Demand During a Multiple Dry Year Period Year Ending in 2020 – AFY 87
Table 16.9 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2020 – AFY 87

Tables 16.10 through 16.12 ..... *87*
Table 16.10 – Projected Supply During a Multiple Dry Year Period Year Ending in 2025 - AFY 87
Table 16.11 – Projected Demand During a Multiple Dry Year Period Year Ending in 2025 – AFY 87
Table 16.12 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2025 – AFY 88

Tables 16.13 through 16.15 ..... *88*
Table 16.13 – Projected Supply During a Multiple Dry Year Period Year Ending in 2030 - AFY 88
Table 16.14 – Projected Demand During a Multiple Dry Year Period Year Ending in 2030 – AFY 88
Table 16.15 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2030 – AFY 88

Appendices
Appendix A - Public Outreach and Participation
Appendix B - Groundwater Management Plan - West San Jacinto Groundwater Basin
Appendix C - California Urban Water Conservation Council - Best Management Practices Reports for 2002/2003 and 2003/2004
Appendix D - Water Shortage Contingency Plan
Appendix E - List of References
Appendix F - Department of Water Resources Checklist
Appendix G - Cooperative Agreements - Hemet/San Jacinto Water Management Area

Section 1 - Introduction

Urban Water Management Planning Act

Water Code Section 10620 (a) of the Urban Water Management Act, states "Every urban water supplier shall prepare and adopt an urban water management plan in the manner set fourth in Article 3 (commencing with section 10640). These plans are to be updated every five years and submitted to the Department of Water Resources (DWR). Urban water management plans for 2005 are due to DWR on December 31, 2005.

Requirement for the urban water management plans include:

- Assessment of current and projected water supplies
- Evaluation of Demand and Customer Types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan for in the event of water shortage
- Comparison of demand and supply projections.

This report has been prepared to comply with the Urban Water Planning Act. In addition to meeting the requirements of the Act, this report will be used to support water supply assessment and verification required by Senate Bills 610 and 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size prior to project approval. Both bills allow an Urban Water Management Plan to be used as a source document that may be used to fulfill these legislative requirements.

Public Participation

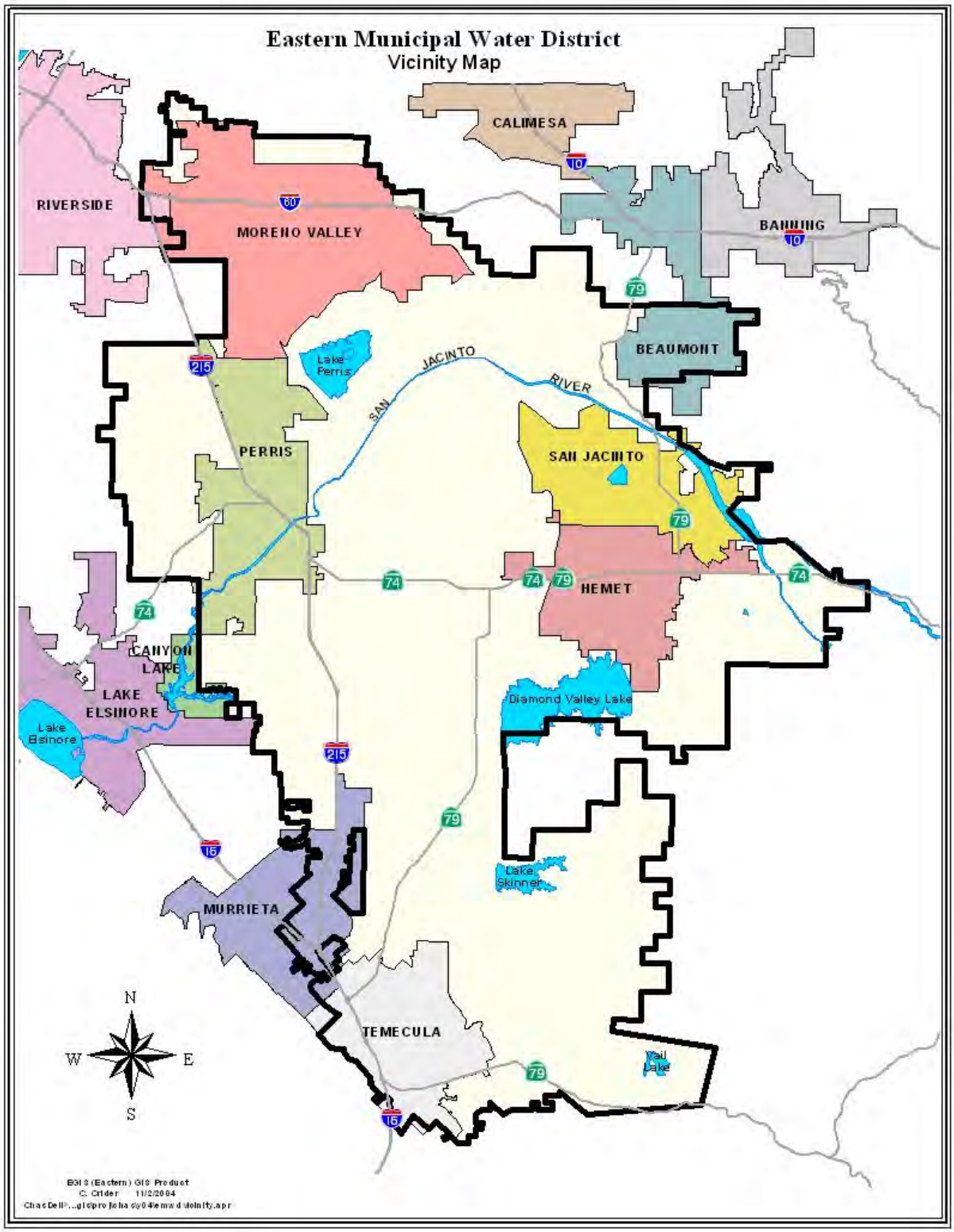
Article 3, Section 10642 of the Urban Water Management Plan Act requires that each urban water supplier shall encourage the active involvement of diverse social, cultural and economic elements of the population within the service area. EMWD has encouraged the participation of sub agencies, cities and the County of Riverside and other public groups. Public participation and coordination efforts are detailed in Appendix A.

Eastern Municipal Water District

Eastern Municipal Water District (EMWD, District) is a public water agency formed in 1950 by popular vote. In 1951, it was annexed into the Metropolitan Water District of Southern California (MWD) and gained a supply of imported water from the Colorado River Aqueduct (CRA). Today, EMWD remains one of MWD's twenty-six member agencies and receives water from Northern California through the State Water Project (SWP) in addition to its deliveries through the CRA.

EMWD's initial mission was to deliver imported water to supplement local groundwater for a small, mostly agricultural, community. Over time, EMWD has evolved to include groundwater production, desalination, water filtration, wastewater collection and treatment, and regional water recycling to the list of products and services it offers to its over 100,000 customers. Located in one of the most rapidly growing regions in the

Figure 1.1 Areas Within EMWD Boundaries



Nation, EMWD has a mission "to provide safe and reliable water and wastewater management services to our community in an economical, efficient, and responsible manner, now and in the future."

A five-member Board of Directors governs EMWD. Each director serves an area of equivalent population size within EMWD's boundaries and is elected to office every four years. As a member agency of MWD, EMWD also has a board member appointed to the MWD Board of Directors.

EMWD is located in western Riverside County, approximately 75 miles east of Los Angeles. The 555 square mile service area includes six incorporated cities in addition to the unincorporated areas of the County of Riverside.

The areas within EMWD's boundary are:

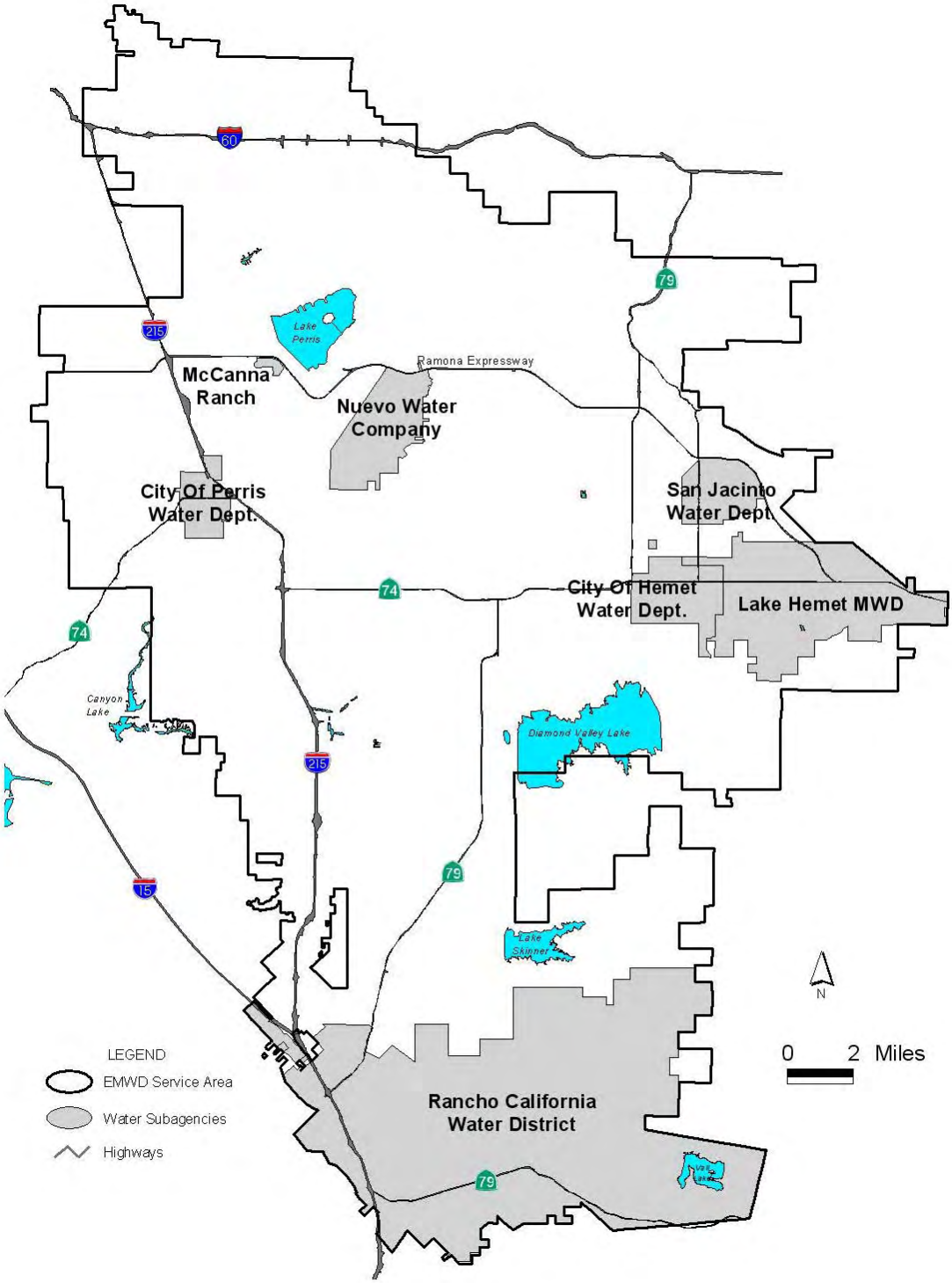
City of Hemet
City of Moreno Valley
City of Murrieta
City of Perris
City of San Jacinto
City of Temecula
Homeland
Lakeview
Murrieta Hot Springs
Nuevo
Quail Valley
Romoland
Sun City
Valle Vista
Winchester

In most of the listed areas, EMWD provides both water and sewer service. However in some places, EMWD provides only sewer or water service, or provides wholesale water to a sub agency.

EMWD is a wholesale provider to the following sub agencies:

City of Hemet Water Department
City of Perris Water Department
City of San Jacinto Water Department
Lake Hemet Municipal Water District (LHMWD)
McCanna Ranch Water Company
Nuevo Water Company
Rancho California Water District (RCWD)

Figure 1.2 - EMWD Sub Agencies



Several of these agencies have or will prepare their own Urban Water Management Plan (UWMP). With the exception of RCWD and McCanna Ranch Water Company, EMWD has discussed and reviewed the supplemental water demand required by each agency

with representatives of that agency. The demand requirements and water supply are discussed in this plan. RCWD, while an EMWD sub agency, receives water directly from a connection to MWD. RCWD is preparing its own UWMP that will address their water supply issues. RCWD's population, demand and supply is not analyzed nor discussed in this plan. McCanna Ranch Water Agency depends on EMWD for emergency purposes and does not have any annual projected demand. The Murrieta Water Company was a subagency at the beginning of 2005, but merged with Western Municipal Water District in November and is not anticipated to demand water form EMWD after 2005.

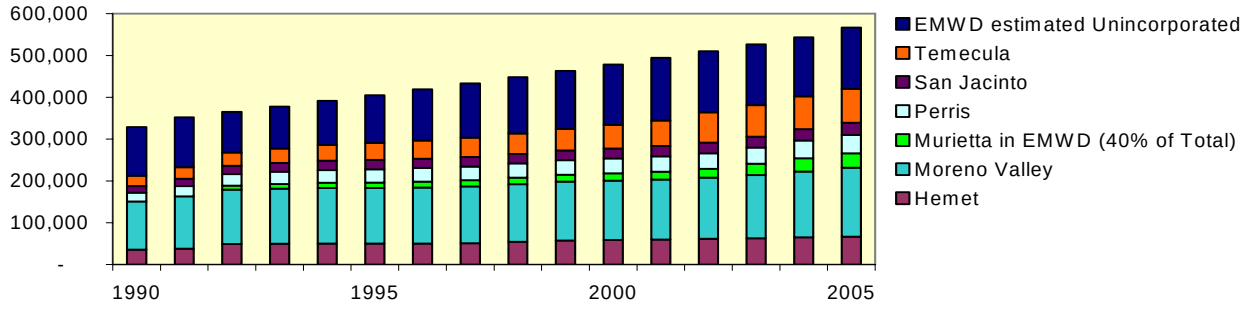
Population

EMWD is located in one of the most rapidly growing regions in the United States. Since 1990, over 230,000 people have been added to the service area of EMWD, nearly doubling the population. Table 1.1 and Figure 1.3 show the estimated population of various EMWD areas from 1990 to 2005. These estimates are taken from the California Department of Finance Report 90-E4, Population Estimated for California State and Counties.

Table 1.1 - Population Within EMWD's Boundary

	1-1-90	1-Apr-90	1-Jan-95	1-Jan-00	1-Jan-05
Population		CENSUS		CENSUS	
Hemet	35,350	36,094	50,100	58,500	66,455
Moreno Valley	115,500	118,779	132,700	142,000	165,328
Murrieta in EMWD (40% of Total)	-	-	13,040	17,540	34,041
Perris	21,050	21,500	32,050	35,900	44,594
San Jacinto	15,500	16,210	22,250	23,400	28,437
Temecula	25,300	27,099	40,850	56,600	81,397
Total EMWD Cities	212,700	219,682	290,990	333,940	420,252
EMWD Estimated Unincorporated	UNK	120,075	114,033	144,716	146,483
Estimated EMWD Total Population	UNK	339,757	405,023	478,656	566,735

Figure 1.3 - Population Growth Within EMWD Boundary Population Projections



Growth Projections

EMWD uses several tools to assist in planning for new development and the new demand for water that comes with them. A database of proposed projects, regional projections, socioeconomic studies and the Riverside County Integrated Plan are all used to develop growth projections.

To track new construction in the District, EMWD developed a Geographic Information Systems (GIS) database of new developments. This database contains information about size, location and status of new projects within EMWD's boundaries. New projects are tracked from the initial planning stage until construction is complete and new meters are installed. This database allows the District to anticipate where new demand for water will be concentrated and estimate when new projects will require water and sewer service. Projects that have engineered design plans in plan check or where construction is initiated are anticipated to impact the District within one to five years. For projects still in the planning stages, anticipating a construction date can be difficult. Planned projects can be delayed or expedited based on the economy, environmental constraints, infrastructure requirements or any number of additional factors.

To insure that planning efforts for future growth are comprehensive, EMWD incorporates regional projections to calculate future growth. Projections from the Southern California Association of Governments (SCAG) 2004 Transportation Plan are used as a guideline to approximate what the long-term growth rates will be for EMWD.

In addition to the new project information collected by EMWD and projections by SCAG, EMWD uses an economic consultant to develop housing projections. In May of 2003, Empire Economics completed a socioeconomic study that resulted in a most probable demand projection for new homes for each of the 1990 Census Tracts in the District. Since EMWD did not have a comprehensive database of new projects in 2003, that study was based largely on SCAG projections published in 2000. In 2004 and 2005, the same consultant returned performing a detailed analysis of growth in several small portions of the District. By doing field studies and economic analysis of the study area, the consultant was able to develop most probable demand projections for new homes within each of 30 sub areas covering much of EMWD's service area.

Using these housing projections, SCAG projections and persons per household data, EMWD has developed its population projection as seen in Table 1.2. The projection provided does not include the population of any portion of the District served water through Rancho California Water District including Temecula.

Table 1.2 - Current and Projected Population

	2005	2010	2015	2020	2025	2030
Service Area Population	493,960	583,050	674,550	759,155	830,020	889,230

Climate

EMWD has a semi-arid climate characterized by hot, dry summers and cooler winters. The average rainfall is between 11 and 12 inches occurring mostly in December through March. The region experiences wide variation in rainfall and periodic local drought. Table 1.3 has a summary of temperature and precipitation for EMWD's service area taken from local climate stations.

Table 1.3 - EMWD Climate

	Jan	Feb	Mar	Apr	May	June
Standard Monthly Average Et^o	2.47	2.65	3.79	5.05	5.78	11.50
Average Rainfall (inches)	2.54	3.16	2	0.68	0.32	0.05
Average Max. Temperature (Fahrenheit)	66.1	38.4	69.6	76.7	82.1	91.9
Average Min. Temperature (Fahrenheit)	36.3	38.7	41.1	44.4	49.6	54

Table 1.3 - EMWD Climate (Continued)

	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average Et^o	6.89	6.68	5.29	4.01	3.01	2.46	54.56
Average Rainfall (inches)	0.03	0.24	0.15	0.25	0.66	1.02	11.09
Average Max. Temperature (Fahrenheit)	97.4	98	92.6	84.2	73.8	67.6	80.7
Average Min. Temperature (Fahrenheit)	58.9	59.4	57.5	39.8	34.5	34.5	46.9

In dry years, potable water demand increases slightly during the months when rainfall usually occurs, but peak demand during hot summer months remains fairly constant. Even in wet years, the demand may decrease during winter months, but still remains high during peak summer months.

The recycled water system, which serves agricultural and landscape demand, is slightly more sensitive to climate fluctuation. In dry years, there may be a small increase in demand during typically wet months to make up for the lack of rainfall, but summer's demand remains consistent. Wet years actually cause greater concern than dry years for the operation of the recycled water system. Excessive rainfall reduces the demand of customers during the rainy season and increases the supply of recycled water. This forces EMWD to find other means of disposing excess recycled water.

Other Demographic Factors

As the population within EMWD continues to grow, the characteristics of the service area are continually changing. District-wide, tract homes, commercial centers and new industrial warehouses are replacing acres of agriculture and open space. The average household size is becoming smaller and the medium income is increasing. Over the next 25 years, EMWD's population is projected to grow by over 400,000 people, nearly doubling its current population.

The area has a history of rapid growth followed by major declines in the housing market. From the mid-1980's to 1990, population growth in EMWD routinely exceeded 10% per year. In the early 1990's, growth slowed during an economic recession. During the late 1990's, growth began to steadily increase, and the first five years of the 2000's brought accelerated growth in the housing market. This growth has challenged EMWD to develop new sources of supply and construct new facilities and infrastructure to bring water to hundreds of new customers each month.

Some indicators suggest that growth within EMWD's service area may have reached its peak rate in 2004, but others suggest that 2005 may see just as much growth as the past year. However, what is certain is that EMWD is still a growing water agency. Ultimate demand estimates indicate that before EMWD reaches build out, the population

will nearly triple its current size. Land will continue to be developed in western Riverside County as more and more people are added. Just as it has in the past, EMWD will continue to meet the challenges of new development with innovation, efficiency and responsibility.

Section 2 – Water Sources

EMWD has three sources of water supply: imported water from MWD, local groundwater production, and recycled water. Water sources can be divided into two types - potable and non-potable. Sources of potable water supply, suitable for all uses including human consumption, include:

- Groundwater within the San Jacinto Watershed
- Desalination plants that treat groundwater with a high salt content through reverse osmosis until it is acceptable for drinking
- Microfiltraion plants owned and operated by EMWD, filtered water from the Colorado River or State Water Project (SWP) through membranes to remove particulate contaminants to potable water standards
- The Henry J. Mills Filtration Plant (Mills), owned and operated by MWD, which treats water from northern California and provides it for sub agency purchase
- The Robert F. Skinner Filtration Plant (Skinner), owned and operated by MWD. This plant treats a blend of Colorado River Water (CRW) and water from northern California for potable use.

See Table 2.1 for the amount of potable water projected to be supplied by each source for 2005 to 2030.

In addition to potable water supplies, EMWD has several sources that supply water that may not be suitable for drinking but can be used for agriculture, landscape irrigation and industrial processes. These sources include:

- Recharge water from MWD. This untreated water from MWD is percolated into the ground through the soil, adding water to the aquifer below. EMWD and others can extract this water at a later date for beneficial uses.
- Untreated water from MWD for agricultural purposes. Water imported from MWD does not often need additional filtration to be used to irrigate crops.
- Recycled water. This highly treated wastewater can be used for many purposes including agriculture, landscape irrigation, and industrial use.

The projected amount of non-potable water supplied by each source from 2005 to 2030 is summarized in Table 2.2.

The location of each potable water source can be seen in Figure 2.1. Groundwater is the major supply of water in the Hemet/San Jacinto area portion of EMWD. This area includes the Cities of both Hemet and San Jacinto as well as surrounding unincorporated areas. The desalination plant serves the middle portion of the District including Menifee, Sun City, north Canyon Lake and Quail Valley. The micro filtration plant in Perris currently serves Perris, Romoland, Lakeview and Nuevo. The Hemet Micro filtration Plant will supplement supply to the Hemet/San Jacinto area. Mills serves Moreno Valley, Menifee, Perris, Sun City, Good Hope, Mead Valley, Lakeview, Nuevo, Romoland, north Canyon Lake, and Quail Valley, while Skinner in the southeast, serves Murrieta, Murrieta Hot Springs, and, occasionally, Menifee, and southern Sun City. In times of peak demand, Skinner is also available to serve demand in the Hemet/San Jacinto area. The limits of services for each source of supply often vary due to demand level and operation procedures and constraints.

Table 2.1 - Potable Water Supply by Source (AFY)

	2005	2010	2015	2020	2025	2030
EMWD Groundwater Production in the San Jacinto Basin						
West San Jacinto Area	6,000	6,000	6,000	6,000	6,000	6,000
Hemet/San Jacinto Basin Area – Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Hemet/San Jacinto Recovery of Recharged Groundwater		5,600	6,600	6,400	6,200	6,200
EMWD Groundwater Desalination Program in the San Jacinto Basin						
Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Perris	2,000	4,500	4,500	4,500	4,500	4,500
Perris II		-	4,500	4,500	4,500	4,500
EMWD Micro-filtration Plants (MWD Full Service Untreated EM –4 & 14)						
Perris FP	8,000	10,900	16,000	16,000	16,000	16,000
Hemet FP		5,400	8,000	8,000	8,000	8,000
MWD Full Service Treated Water Deliveries (EM 12 & 17)						
Mills	55,900	58,600	62,200	76,700	86,800	94,800
Skinner	18,000	14,000	16,000	18,000	20,000	22,000
Total	103,500	115,200	134,000	150,300	162,200	172,000

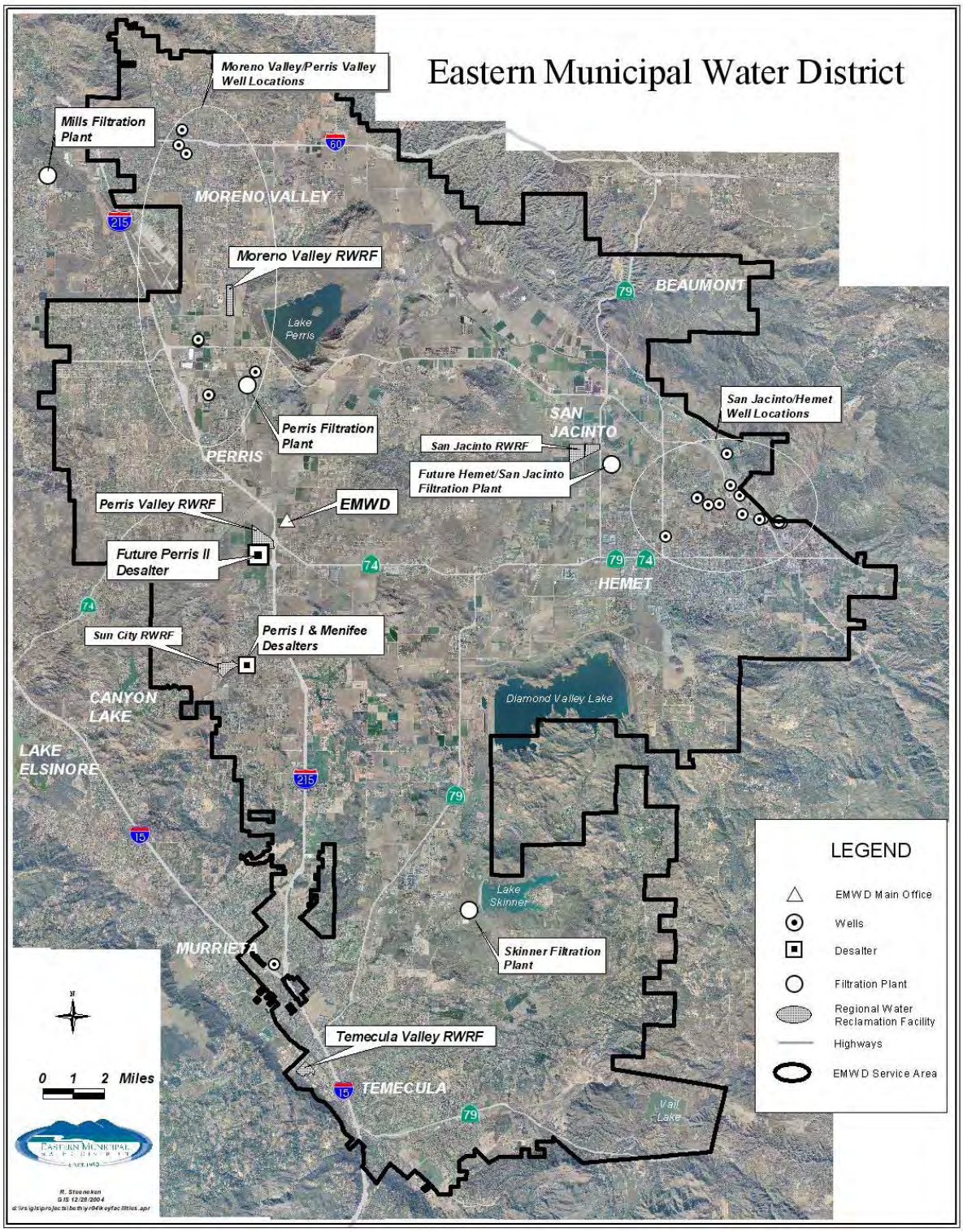
Table 2.2 - Non-Potable Water Supply by Source (AFY)

	2005	2010	2015	2020	2025	2030
Groundwater Recharge (MWD Untreated EM-14)						
Recharge Water into the San Jacinto Basin	8,000	20,000	22,200	22,600	22,600	22,500
MWD Untreated Agricultural Water Deliveries (EM 14)						
MWD Untreated AG	2,500	1,200	2,100	2,600	3,100	3,500
Recycled Water						
Recycled M&I Use	3,500	7,700	10,950	13,300	15,750	17,500
Industrial Enterprise & Aesthetic Improvement	0	7,000	8,250	9,500	10,750	12,000
Recycled Water – Agricultural Use/Wildlife Habitat	21,500	17,700	17,500	17,500	17,500	17,500
RW Total	25,000	32,400	36,700	40,300	44,000	47,000
Total	35,500	53,600	61,000	65,500	69,700	73,000

Table 2.3 - Total Water Supply (AFY)

	2005	2010	2015	2020	2025	2030
Total	139,000	168,800	195,000	215,800	231,900	245,200

Figure 2.1 - Location of Supply Sources



Imported Water

EMWD relies on MWD for 80% of its potable water supply. Treated water ready for potable use is supplied from two sources through separate MWD water treatment facilities. The two sources of water are the SWP and the Colorado River. The two water treatment facilities are Mills and Skinner.

The SWP is California's state-built water and power development and conveyance system. It includes pumping and power plants; reservoirs, lakes, and storage tanks; and canals, tunnels, and pipelines—that capture, store, and convey water from northern California to southern California. Water from the Colorado River is delivered into MWD's service area via the Colorado River Aqueduct (CRA). The water treated at Mills is SWP water and the water treated at Lake Skinner is a blend of Colorado River water and SWP water.

In addition to treated water, EMWD utilizes untreated or non-potable water imported from MWD. This water needs purification and further treatment before it is available for potable use. This water is imported by MWD through the SWP pipeline running through EMWD's service area. Currently, EMWD treats raw water at a single microfiltration plant in Perris. That plant currently has an expansion under construction. In Hemet, construction has begun on another microfiltration plant to add a supply source in that portion of EMWD. These small micro filtration plants allow EMWD to meet the needs of local customers when MWD's treated water resource may be stretched to their limit, especially during peak summer months. Raw water from MWD is also used for agricultural customers and for recharging the groundwater basins EMWD and others rely on.

Groundwater

In an effort to reduce dependency on imported water supplied by MWD, EMWD has developed several programs designed to take advantage of local resources. High-quality groundwater has long been a source of water supply for local customers in the Hemet/San Jacinto area. In Perris, groundwater is blended with imported water for use in the western portion of EMWD. Protecting and developing local groundwater resources to reduce dependency on imported water, is an important objective in EMWD's Strategic Plan.

EMWD's service area encompasses all or part of two different watersheds. The southern portion of the District is tributary to the Santa Margarita River Watershed. The use of all surface and sub-surface waters within the watershed of the Santa Margarita River is under the jurisdiction of the United States District Court for the Southern District of California. The court appointed a Watermaster and Steering Committee to provide recommendations to the court regarding the watershed. EMWD is represented on the Steering Committee. Currently, EMWD does not produce any groundwater in the Santa Margarita Watershed and there are no plans to do so in the future.

The northern part of EMWD's service area covers the San Jacinto Watershed. To the west, the West San Jacinto Groundwater Management Plan was adopted in 1995 under the auspices of Assembly Bill 3030 now codified in the California Water Code. Annual reports on the status of groundwater and water resources efforts in the area have been published since 1996. To the east, the Hemet/San Jacinto Water Management plan is in process. EMWD is working with other agencies, the cities, and private groundwater

producers in the area to develop and implement a management plan that should be complete and adopted in the coming year. The first annual report for the Hemet/San Jacinto Water Management Plan area was published in June 2005. The groundwater EMWD produces and is considered in this Urban Water Management Plan, is pumped from the San Jacinto Watershed.

Part of the plan being developed for the Hemet/San Jacinto Groundwater Management area will expand the current use of raw or untreated water from MWD to recharge portions of the San Jacinto basin. In 2004 and 2005, EMWD, LHMWD and the Cities of Hemet and San Jacinto addressed deteriorating groundwater levels in the area and reduced the historical impact of overdraft caused by past groundwater production by implementing a cooperative groundwater recharge program. In 2004, 6,000 AF of SWP water was recharged at two existing recharge pond sites in the San Jacinto riverbed and, for 2005, the recharge goal is 8,000 AF. EMWD is now developing the Hemet/San Jacinto Recharge and Recovery Program – a groundwater replenishment and recovery program that will be implemented in two phases. The first phase will entail construction of six recharge basins in the San Jacinto riverbed. Phase II involves nine additional recharge basins and a 7.7 mile pipeline. Both phases include construction of recovery or extraction wells as well as monitoring wells. This regional effort, funded partially by a $5 million grant from the California Department of Water Resources, is expected to cost $13.7 million and will protect and optimize the use of local resources.

EMWD constructed the Menifee Desalter to recover and treat high total dissolved solids (TDS) groundwater and manages the salinity in the West San Jacinto Groundwater Basin Management Plan area. This facility treats high TDS groundwater from the Menifee and south Perris areas and produced 1,441 AF of potable water in 2004. Construction of a second desalter, the Perris I Desalter next to the Menifee Desalter is complete and the new plant will expand the capacity of desalinated water production from 3 to 7 MGD. Test wells are being drilled for a third desalter, and an iron and manganese removal facility, initiated in 2004, will be constructed at the Sun City Regional Water Reclamation Facility next to the existing and planned desalters.

Recycled Water

In addition to groundwater and imported water, EMWD is dedicated to expanding and maximizing the use of recycled water produced at four regional water reclamation facilities. Demographic changes in EMWD's service area are increasing the amount of recycled water available while reducing the traditional demand by agricultural customers. This has challenged EMWD to improve reliability and provide recycled water to a growing market of commercial, industrial and institutional customers.

Section 3 - Groundwater

EMWD's only locally produced potable water is the groundwater extracted from the basins below the San Jacinto Watershed. This water accounts for approximately 20% of EMWD's supply and with the use of new technology and in partnership with others in the region; EMWD is working to ensure the quality and reliability of the basins for now and into the future.

Basin Description

San Jacinto Watershed - Groundwater Management Zones in EMWD's Service Area

The San Jacinto Watershed covers an area of approximately 728 square miles, measured above a point just downstream from Railroad Canyon Dam. All of the streams and rivers in the watershed are ephemeral; they flow only when precipitation occurs and much of this flow infiltrates to groundwater. When storms are unusually intense and prolonged, the ground saturates quickly and most of the precipitation runs off to streams. The San Jacinto River rises in and drains the western slopes of the San Jacinto Mountains. Waterways tributary to the river include the North and South Forks, Strawberry, Indian, Poppet, and Bautista Creeks. The river recharges the groundwater basin in the area southeast of the City of San Jacinto. It then flows northwest past the Lakeview Mountains before turning southwest to flow across the Perris Valley floor. The San Jacinto River ultimately flows into Lake Elsinore via Railroad Canyon and Canyon Lake. Lake Elsinore, when full, overflows into Temescal Wash, which joins the Santa Ana River near Prado Dam.

The San Jacinto groundwater basin lies within alluvium-filled valleys carved into the elevated bedrock plateau of the Perris Block. Collectively, the basins are nearly surrounded by impermeable bedrock mountains and hills. Internally, island-like masses of granite and metamorphic bedrock rise above the valley floor.

The San Jacinto and Casa Loma fault zones are the major geologic features that bound and/or crosscut many of the groundwater basins, and typically are effective barriers to groundwater flow. The area between the San Jacinto and Casa Loma faults is a deep, alluvium-filled graben of tectonic origin, commonly referred to as the San Jacinto Graben. The effective base of freshwater in the graben is known to be quite deep but has not been precisely determined. The San Jacinto Graben consists of a fore bay area in the southeast where surface water recharge primarily occurs and a pressure area in the northwest where deep aquifers exist under confined conditions. To the east, the San Jacinto mountain range is the dominant geographic feature of the region, rising to a height of 10,805 feet.

Groundwater management zones were delineated based on major impermeable boundaries, constrictions in impermeable bedrock, groundwater divides, and internal flow systems. The eight-groundwater management zones in the San Jacinto Watershed within EMWD's service area are:

1. Canyon
2. San Jacinto Upper Pressure
3. San Jacinto Lower Pressure
4. Lakeview/Hemet North
5. Hemet South

6. Perris South
7. Perris North
8. Menifee

Canyon Management Zone - The Canyon, San Jacinto Upper Pressure, and San Jacinto Lower Pressure Management Zones lie along a northwest to southeast axis in the northern part of the San Jacinto Valley. The boundaries of the Canyon Management Zone include the San Jacinto Mountains to the east and the San Jacinto fault to the west. The San Jacinto Mountains are composed of consolidated crystalline bedrock and semi-consolidated sedimentary rocks. These rocks are virtually impermeable and bound the water-bearing, alluvium-filled canyons within this management zone.

San Jacinto Upper Pressure Management Zone - The San Jacinto Upper Pressure Management Zone is bounded by the San Jacinto fault to the northeast, the Casa Loma and Bautista Creek fault zones to the southwest, and the flow system boundary with the San Jacinto Lower Pressure Management Zone to the northwest. The San Jacinto fault is a known barrier to groundwater flow, and separates the San Jacinto Graben from the San Timoteo Badlands and the San Jacinto Mountains. East of the City of San Jacinto, a branch of the San Jacinto fault zone cuts the alluvial fill by extending southeast across the San Jacinto River and along the channel of Bautista Creek until it intersects the Park Hill fault. This branch of the San Jacinto fault zone separates the San Jacinto Upper Pressure Management Zone from the Canyon Management Zone.

A branch of the San Jacinto fault zone extends southeast along the channel of Bautista Creek until it intersects the Park Hill fault. In the early 1900s, the barrier effect of the fault resulted in rising groundwater within the San Jacinto River upstream of the fault. This area is known as the Cienega and is an area of significant municipal groundwater production. The Casa Loma and Bautista Creek fault zones are known barriers to groundwater flow. However, groundwater leaks across the fault zones as underflow to the Hemet South and Lakeview/Hemet North Management Zones.

San Jacinto Lower Pressure Management Zone - Boundaries of the San Jacinto Lower Pressure Management Zone include the San Jacinto fault to the northeast; the Casa Loma fault and its northwestward extension; various crystalline bedrock outcrops to the north and west; and the flow system boundary with the San Jacinto Upper Pressure Management Zone to the southeast.

Lakeview/Hemet North Management Zone - Boundaries of the Lakeview/Hemet North Management Zone include the Casa Loma fault zone to the east; the groundwater divide near Esplanade Avenue to the south; the Lakeview Mountains to the west and south; the Bernasconi Hills to the north; and a bedrock constriction/saddle to the west. The Casa Loma fault zone is a known barrier to groundwater flow. However, groundwater leaks across the fault zone as underflow from the Upper San Jacinto Management Zone. Impermeable, crystalline bedrock outcrops that compose the Bernasconi Hills and the Lakeview Mountains to the north and south, respectively, are hard rock barriers to groundwater flow. To the west, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview/Hemet North Management Zones.

Hemet South Management Zone - The boundaries include the Casa Loma and Bautista Creek fault zones to the east; the groundwater divide near Esplanade Avenue

to the north; the groundwater divide in the Winchester area to the west; and various crystalline bedrock outcrops to the south. The Casa Loma and Bautista Creek fault zones are known barriers to groundwater. However, groundwater leaks across the fault zones as underflow from the San Jacinto Upper Pressure Management Zone.

Perris South Management Zone - Boundaries of the Perris South Management Zone include a groundwater divide in the Winchester area; bedrock constrictions/saddles bordering the Menifee Management Zone; a bedrock constriction/saddle bordering the Lakeview/Hemet North Management Zone; a bedrock constriction bordering the Perris North Management Zone; and the surrounding bedrock mountains and hills. A groundwater high exists in the Winchester area near Highway 79. The divide is likely an artifact of natural and artificial recharge and groundwater production patterns. As such, the position (or the very existence) of this groundwater divide may vary with changing artificial recharge and/or production patterns.

Southwest of EMWD's Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Management Zone; this is especially true during times of high groundwater levels. Southeast of Sun City, a similar narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium also is a boundary between the Perris South and Menifee Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Management Zone.

To the northeast, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview Management Zones. Under original flow conditions, groundwater flowed westward from Lakeview into Perris South. However, groundwater now flows from Perris South eastward into Lakeview toward a “pumping depression” in the groundwater table.

Perris North Management Zone - North of the San Jacinto River in the Perris area, the gap between the Bernasconi Hills and the bedrock hills to the west narrows. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and the Perris North Management Zones.

Impermeable, crystalline bedrock outcrops that compose the surrounding mountains and hills are hard rock barriers to groundwater flow.

Menifee Management Zone - Boundaries of the Menifee Management Zone include the bedrock constrictions/saddles bordering the Perris South Management Zone, a bedrock constriction to the east, and the surrounding bedrock mountains and hills. Southwest of the Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Management Zone, especially during times of high groundwater levels.

Southeast of Sun City, a similar narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium also is a boundary between the Perris South and Menifee Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Management Zone.

Groundwater Management

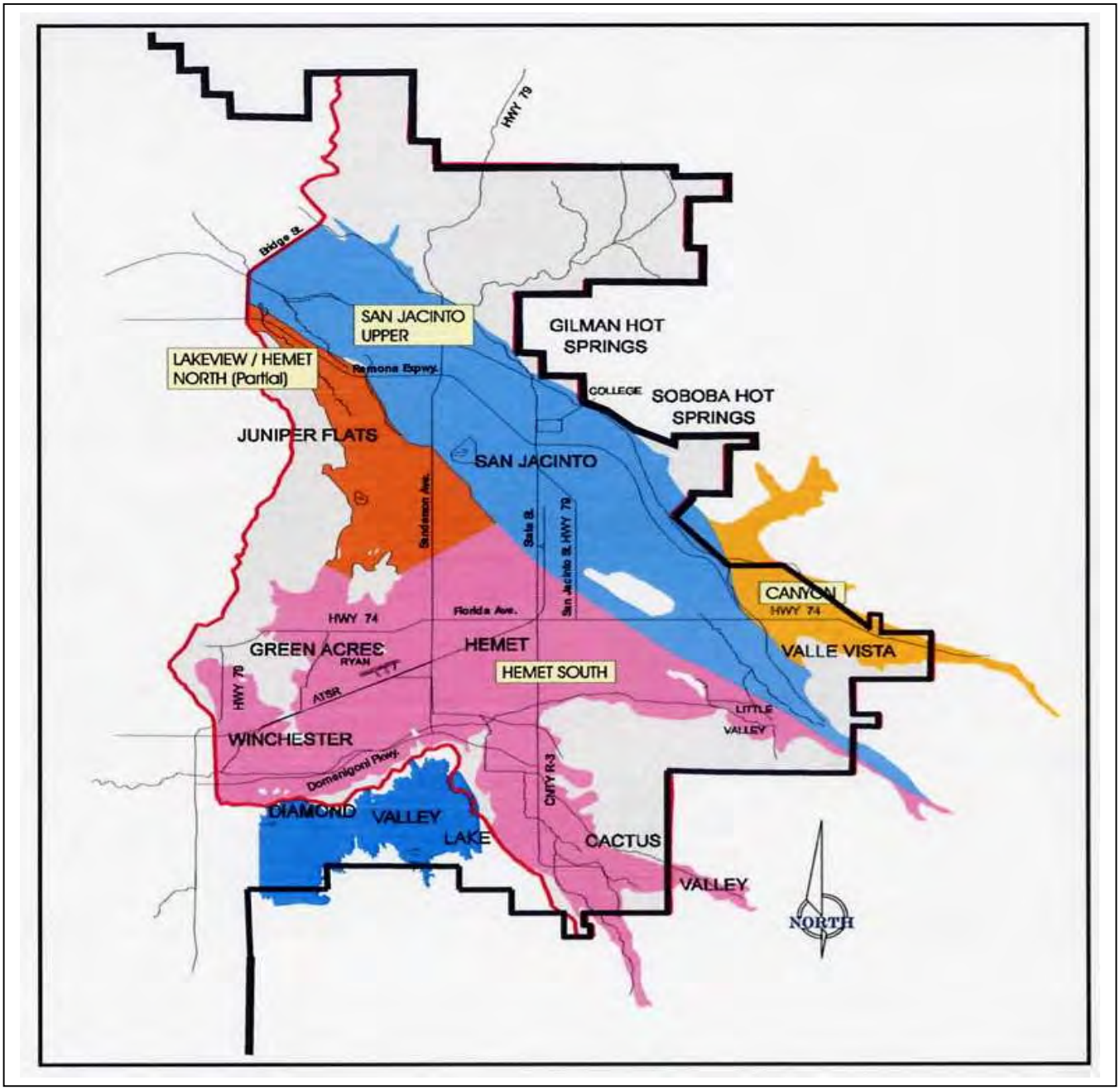
EMWD extracts groundwater from multiple management zones in the San Jacinto Watershed. These zones are covered by one of two groundwater management plans. The Hemet South, Canyon, San Jacinto Upper Pressure, and the Hemet North part of the Lakeview/Hemet North Management Zones are covered by the Hemet/San Jacinto Water Management Plan. This plan is currently being developed and should be finalized in 2005 or early 2006. The Perris North, Perris South, San Jacinto Lower Pressure, and Menifee Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone are covered by the West San Jacinto Groundwater Basin Management Plan. That Plan has been in place since 1995 and a copy is attached as Appendix B.

Hemet/San Jacinto Water Management Area

History of the Hemet/San Jacinto Basin Water Management Plan

Developing and implementing comprehensive water resources management programs to protect, optimize, and enhance the use of all available resources is a strategic goal at EMWD. Groundwater levels in the Hemet and San Jacinto sub-basins steadily declined during a 40-year span from the early 1940's to the end of the 1970's. The 1987-1992 drought quickly followed with similar impact. Recent years with below average rainfall and increased groundwater production have caused water levels to continue to decline. Therefore, groundwater resources need to be responsibly managed and protected. EMWD and local municipal and private groundwater producers are working together to develop and implement a groundwater management plan for the eastern portion of the Hemet/San Jacinto area.

Figure 3.1 - Hemet/San Jacinto Water Management Area



In 1995, the Soboba Band of Luiseno Indians (Tribe) entered into negotiations with EMWD and the Lake Hemet Municipal Water District (LHMWD) to settle groundwater claims. In 2000, the Tribe filed a lawsuit against MWD alleging MWD interfered with Tribal water rights when it constructed the San Jacinto Tunnel along the Colorado River Aqueduct. Since then, negotiations and numerous discussions have lead to the development of the Principles of Settlement. One of the main provisions of the Principles of Settlement is the development of a groundwater management plan.

In June of 2001, the Department of Water Resources (DWR) and local agencies executed a Memorandum of Understanding (MOU) to formulate a groundwater management plan for the Hemet/San Jacinto area. A groundwater policy committee was formed with elected officials from the Cities of Hemet and San Jacinto, LHMWD, EMWD and representatives of private groundwater producers. DWR acts as an impartial mediator to the policy committee. Since it was formed, the policy committee has discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment, export of groundwater from the basins, and how to maximize the use of reclaimed water. It has formed a technical committee to provide guidance and has participated in public outreach meant to share information and encourage cooperation.

In September of 2003, an agreement was made between EMWD, LHMWD and the cities of Hemet and San Jacinto to develop a groundwater monitoring program. Under this agreement monitoring began in 2004, and the first report was published in June of 2005. EMWD, LHMWD and the Cities of Hemet and San Jacinto are all participating in the funding and implementation of the monitoring program. Once the groundwater management plan is in place, future annual reports will be submitted to the Watermaster.

EMWD, LHMWD and the Cities of Hemet and San Jacinto also agreed on the Interim Principles of Groundwater Management in 2003 and then the Principles of Groundwater Management in February 2004. These principles establish the framework for a Water Management Plan for the Hemet/San Jacinto area.

There were two additional MOU's in 2004. The first addressed the deteriorating situation in the sub-basins by providing interim stabilization through recharge and was executed in April. The second, executed in June, describes the funding mechanism for developing the groundwater management plan.

Successful implementation of the Hemet/San Jacinto Water Management Plan will help insure that:

- The Hemet/ San Jacinto area will have a reliable and adequate source of future water supply.
- The settlement claims by the Soboba Band of Luiseno Indians are facilitated and accommodated.
- Existing water production and water services system will be expanded to meet future urban growth.
- Water quality in the management plan area will be protected and/or enhanced.
- Cost-effective water supplies and treatment by the public agencies is supported.
- Groundwater overdraft is eliminated and basin yield enhanced.
- A monitoring program is implemented to promote and provide for best management and engineering principles to protect water resources.

The final Water Management Plan will be a part of a Stipulated Judgment that should be approved by the courts in 2005 or early 2006. The plan should be finalized and implemented in 2006. It will limit the amount of water being extracted from the basin to a sustainable yield and implement continued recharge of the basin using imported water. The Cooperative Agreements for the Water Management Plan are available in Appendix G of this plan.

Water Quality

In 2007, 137 wells were sampled for water quality. One hundred and eleven of the wells were sampled by EMWD while others sampled 26 wells and reported the results to EMWD. In general, the best quality of water occurs in the Canyon Management Zone in the Cienega area and along the river. There is significant municipal production there. Table 3.1 shows the high and low TDS and NO_3 –N concentrations for each management zone. Water quality can be effected by mineral content of sediments, recharge and drainage patterns, historic land use factors, screening intervals and depth of wells sampled and other factors. Water quality monitoring will continue as part of the water management plan and results will be submitted to the Watermaster.

Table 3.1 - TDS and NO_3 –N by Management Zone for 2004

Management Zone	No. of Wells	TDS (mg/L)		NO_3 –N (mg/L)	
		High	Low	High	Low
Canyon	19	1,410	210	10.0	<0.1
S.J.U.P.	66	1,500	200	25.0	<0.1
Hemet North	25	1,010	360	5.4	<0.1
Hemet South	27	1,490	220	30.0	0.6
Total	137				

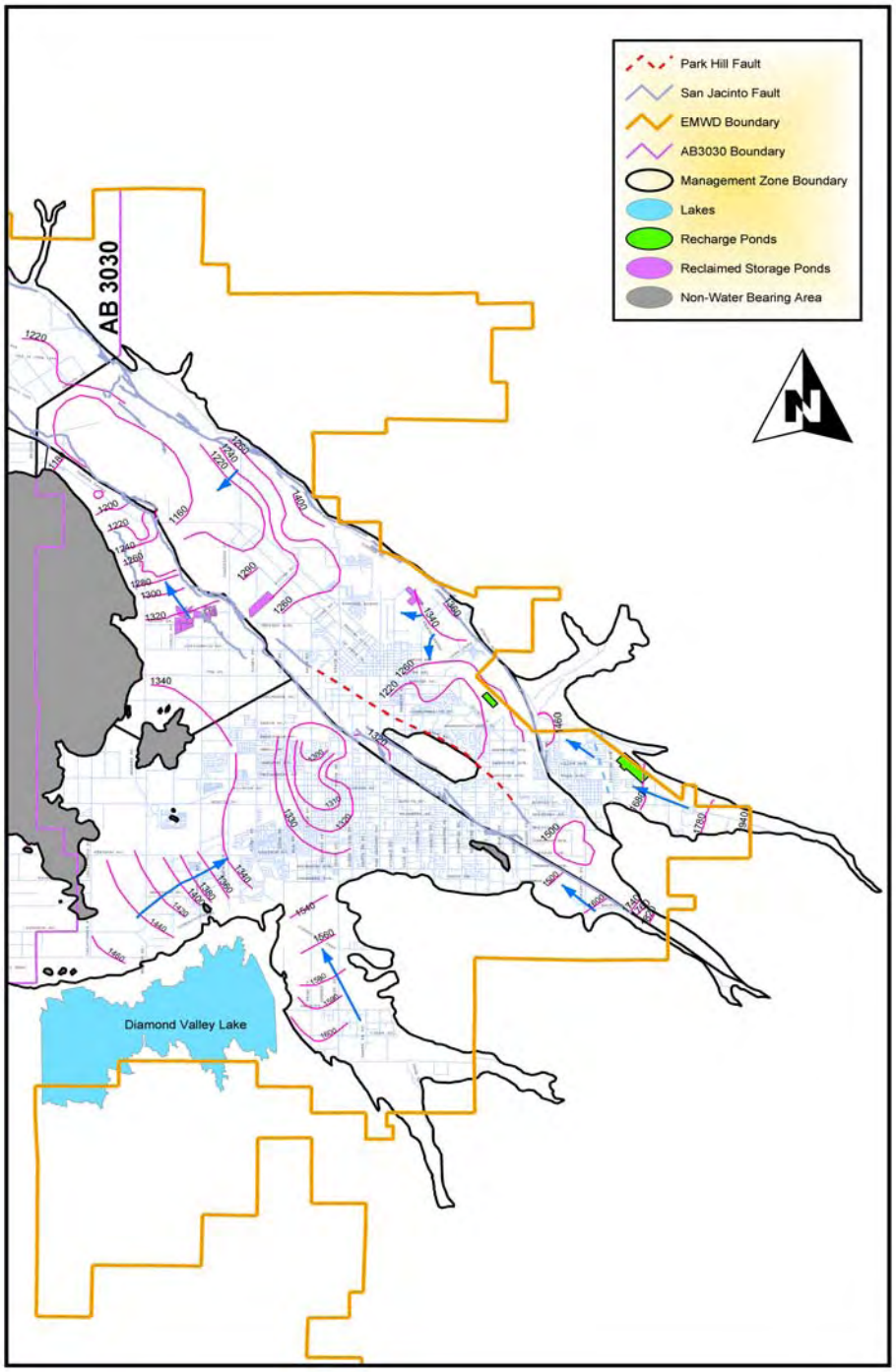
Water Levels

EMWD and others measured over 170 wells in both the spring and fall of 2004. These measures were used to help determine the direction of flow. Water levels taken in the fall of 2004 were also compared to levels measured in fall of 2003 to determine the change in storage. In three out of the four management zones, there was a decrease in groundwater storage, only in Hemet North portion of the Lakeview/Hemet Management Zone showed an increase in groundwater storage. Table 3.2 gives the average change in groundwater storage for 2003 to 2004. Figure 3.2 shows the water level contours for the Hemet/San Jacinto Water Management Area.

Table 3.2 - Average Changes in Groundwater in Storage, 2003 to 2004

Management Zone	Change	Acre Feet
Canyon	Decrease	-1,700
San Jacinto Upper Pressure	Decrease	-3,000
Hemet North (partial)	Increase	600
Hemet South	Decrease	-5,900
Total		-10,000

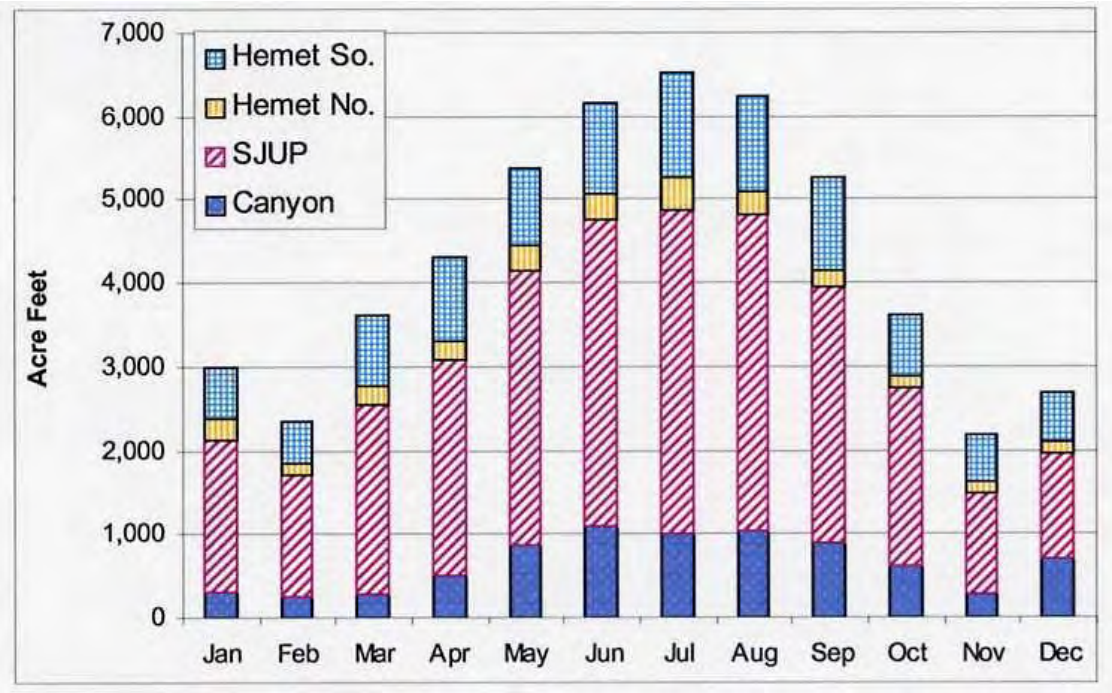
Figure 3.2 – Hemet/San Jacinto Water Management Area Water Level Contour Map



Water Extraction

One hundred and eighty-two wells have been identified in the Hemet/San Jacinto Water Management area. One hundred and forty-nine of these wells are metered, the remaining are estimated based on land use, size, or the number of cows in the case of dairies. In 2004, 51,387 AF of water was produced by all of the users in the basin area. Of the total, nearly 60% of the water was produced between May and September. The water production by month is summarized in the chart below.

Figure 3.3 - Monthly Production by Management Zone



Operational Yield

According to *the Operational Yield Study, Hemet/San Jacinto Groundwater Management Area* (WRIME, Inc., 2003), the operational yield of the groundwater system ranges from approximately 30,000 AFY to 64,000 AFY, with an average of about 41,000 AFY. The operational yield is the long-term withdrawal from the groundwater system not exceeding natural and artificial recharge to the system. From 1958 - 2001 there was an average production of about 50,000 AFY. However, production from 1994 to 2001 was about 68,000 AFY. This is about 27,000 AFY above the average long-term yield estimate. As part of the groundwater management plan, imported water will be added to the basin and the production will be limited to the operational yield.

Recharge

In April of 2004, EMWD, LHMWD and the Cities of Hemet and San Jacinto executed a MOU for an Interim Water Supply Plan. The purpose of the plan was to address the deteriorating situation in the Hemet/ San Jacinto area by providing about 6,000 AF of recharge during the 2004 calendar year. Then, between January 20 and October 24 of 2004, 5,998 AF of imported water from the State Water Project (SWP) was recharged

into the basin at two sites – the Conjunctive Use Ponds in the Intake portion of the San Jacinto Upper Pressure Management Zone and the Grant Avenue Ponds in the Canyon Management Zone.

In November of 2004, a second recharge effort was initiated with the goal of recharging 8,000 AF in 2005. For the 2004 recharge effort, EMWD, LHMWD, and the City of Hemet contributed funding to the purchase and recharge of the SWP, and the City of San Jacinto agreed to reduce groundwater production from the basin to help offset recharge costs. For the 2005 recharge effort, all parties are contributing funds to the program. Under the Water Management Plan, any future conjunctive use projects will be done with the approval of the Watermaster.

Currently, preparation is underway to implement the Hemet/San Jacinto Recharge and Recovery Program. This project will involve 100 acres of ponds, eight recovery wells, and a 60-inch diameter pipeline from EMWD's EM-14 connection to the ponds. The objectives of the project:

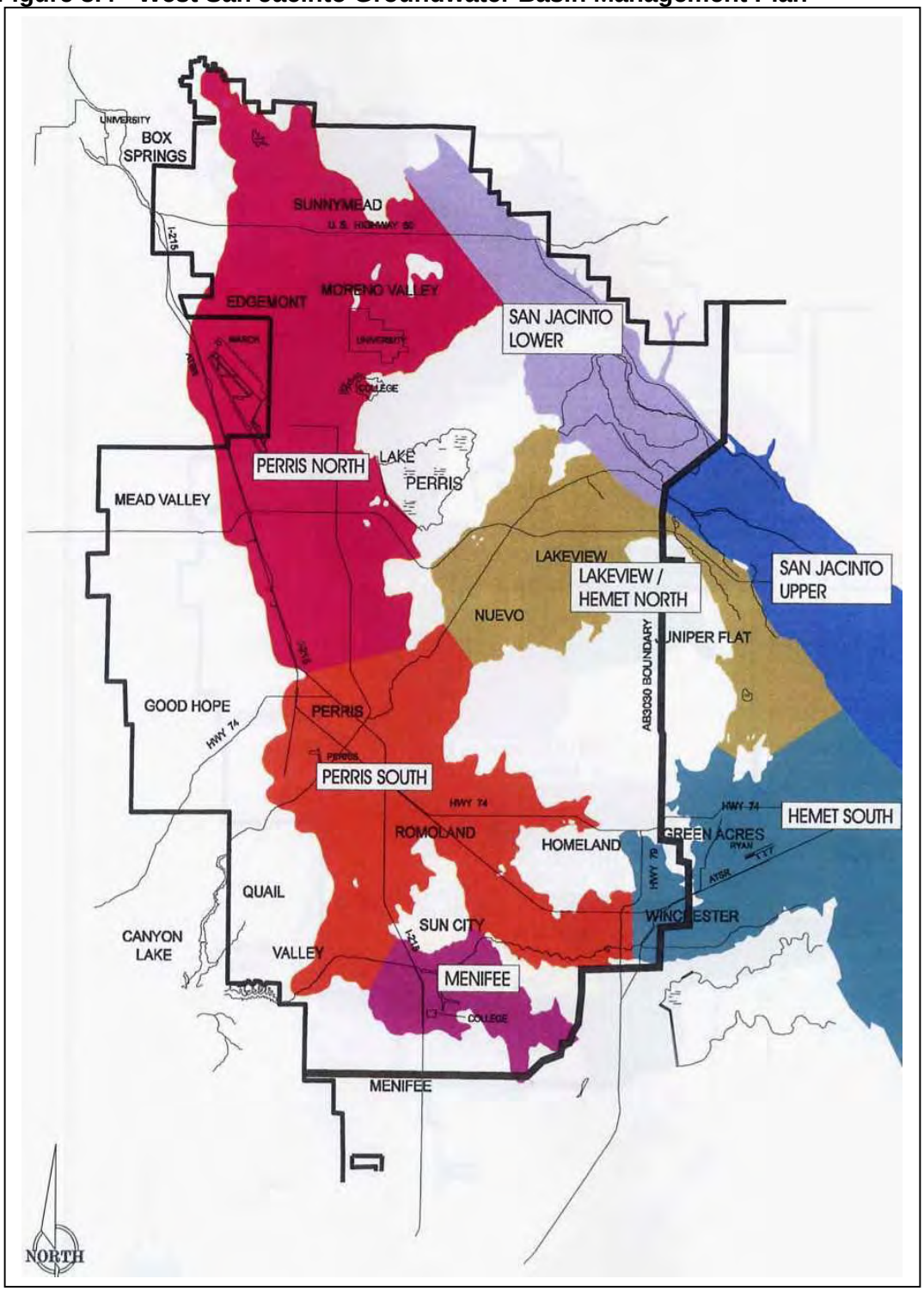
- Provide Tribal Settlement Water - 7,500 AFY
- Elimination of Groundwater Overdraft – 10,000 AFY
- Additional Long-term Supply – 15,000 AFY
- Water Storage for Drought Years – 45,000 AFY

EMWD is currently working with the US Army Corp of Engineers to complete a federal Environment Impact Statement (EIS) in order to obtain a Section 404 Permit and a Section 7 Permit under the Endangered Species Act. The EIS and permitting are both scheduled to be complete in November of 2005. EMWD will also be required to obtain a Streambed Alteration Permit from the California Department of Fish and Game and a 401 Certificate from the Regional Water Quality Control Board.

In addition to the recharge of SWP, there is some incidental recharge of recycled water from a storage pond EMWD has in the area and the MWD San Jacinto Reservoir.

EMWD also has the right to divert surface water from the San Jacinto River to recharge the Canyon sub-basin. Because the San Jacinto River is an ephemeral river, the river does not flow every year. During 2004, flows were insufficient for EMWD to divert water.

Figure 3.4 - West San Jacinto Groundwater Basin Management Plan



History of the West San Jacinto Groundwater Basin Management Plan

In the west San Jacinto area, a cooperative groundwater management plan is already in place to insure the reliability and quality of the water supply. In June 1995, EMWD adopted the West San Jacinto Groundwater Basin Management Plan in accordance with the statutes in the State Water Code resulting from the passage of Assembly Bill 3030

(AB 3030). The plan was adopted after extensive public outreach and meetings with interested individuals and agencies. Implementation of the plan began directly after its adoption. Initial efforts to implement the plan included establishing an advisory committee; prioritizing the sub-basins; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. There have been nine annual reports resulting from the West San Jacinto Groundwater Management Plan, each documenting the implementation of the plan and activities in the sub-basins.

The most recent report was published in April of 2005. It has a thorough accounting of the status of the sub-basins or management zones. Topics covered by the report include the results from EMWD's groundwater quality, water level, and extraction monitoring programs, progress in capping and sealing inactive wells, development of a Regional Water Resources Database, existing and proposed desalters, and other activities in the sub-basins.

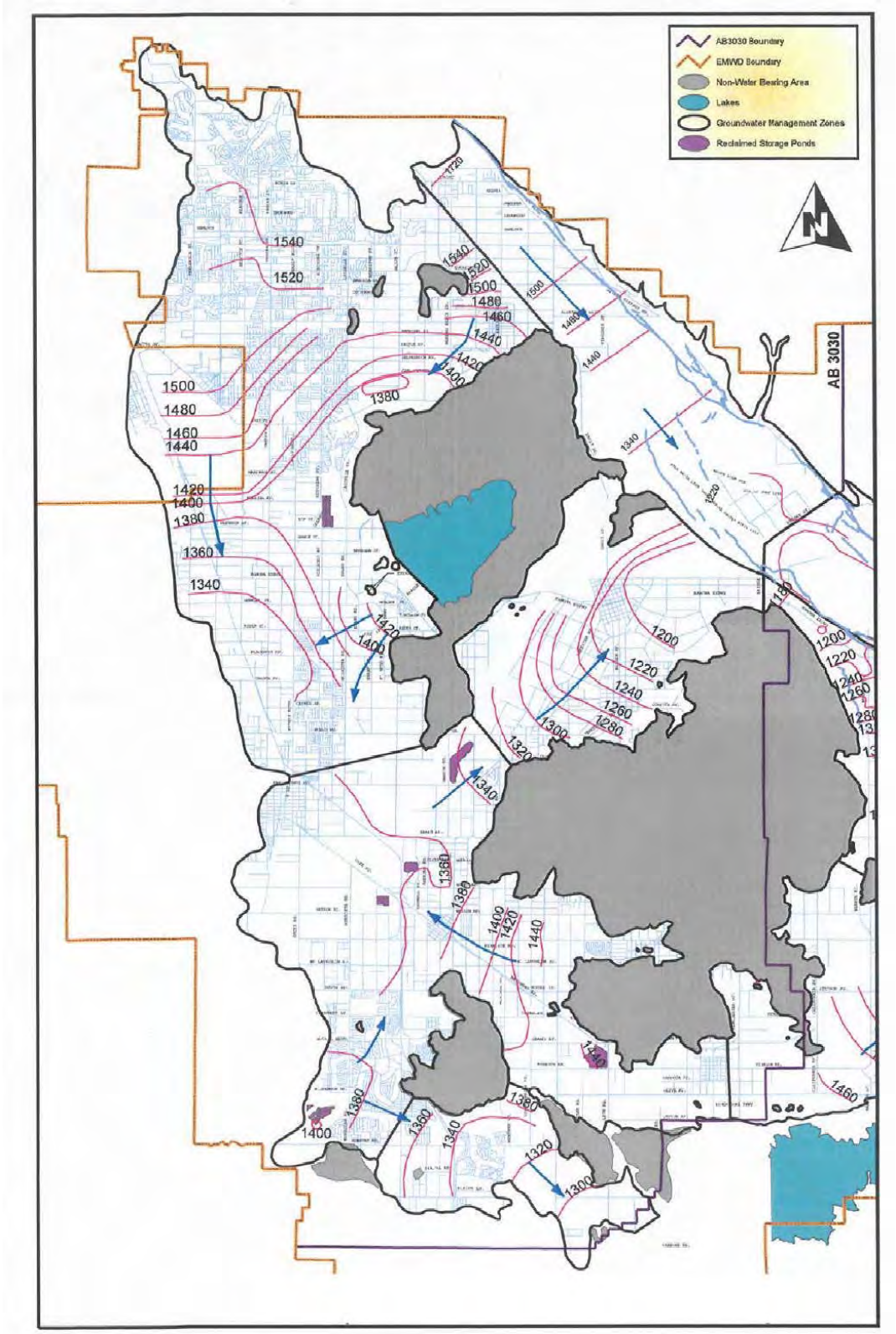
Water Quality

During 2004, as part of the groundwater monitoring efforts, 115 water quality samples were taken from wells in the West San Jacinto Groundwater Management Plan area. The water with the highest TDS level was found in the southwest portion of the Perris South Management Zone. The highest level was 10,300 mg/L. The lowest TDS level of 270 mg/L was found in the northwest portion of Perris North Management Zone. Measurements from 135 wells were sampled and in 2003 and 2004 were used to calculate the statistical volume weighted averages for TDS and NO_3 –N in mg/L for each management zone in 2003 and 2004. The Lakeview portion of the Lakeview/Hemet North Management Zone and in the Perris North and Menifee Management zones show an increase in volume weighted average TDS concentrations. The Perris South Management Zone showed a significant decrease in the volume-weighted average NO_3 –N. Water quality and the character of groundwater are determined by a number of factors including: type and mineral content of sediments; recharge and drainage patterns; historic land use patterns; and screening interval and depth of wells sampled. Fluctuation in high and low values for water quality can also occur because the same wells are not sampled each year. See Chapter 3 of the West San Jacinto Groundwater Basin Management Plan 2004 Annual Report for more information about the water quality of the basin.

Water Levels

In spring 2004, water levels were measured in 150 wells. In addition to giving information on the water levels from year to year, these measurements provide information on the direction of flow. The direction of flow has remained fairly consistent from year to year in the West San Jacinto Basin. There were 135 wells with groundwater level measurement in both 2003 and 2004. These measurements are used to estimate the changes in storage from year to year. In 2004, the Lakeview Portion of the Lakeview/Hemet North Management Zone showed a significant increase in groundwater storage. The Perris North Management Zone showed a minor increase, while the Perris South and Menifee Management Zone showed a slight increase in groundwater shortage. The San Jacinto Lower Pressure Management Zone displayed a slight decrease in groundwater storage. See Figure 3.5 for a water level contour map.

Figure 3.5 – West San Jacinto Basin Water Contour Map



In addition to monitoring water quality and water levels, the basin management plan monitors groundwater production in the basin. Groundwater production in the basin totaled 18,742 AF in 2004 only 13 feet more than in 2003. This production is measured in 54 wells and estimated in 21 wells as part of the Groundwater Extraction Monitoring Program. Table 3.3 shows the extraction from the basin from 2000 to 2004. This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD.

Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management Area

Management Zone	No. of Wells Metered	No. of Wells Estimated	Total No. of Wells	GW (AF) Production Metered	GW (AF) Production Estimated	Total GW Production (AF)
Lakeview/Hemet North (partial)	22	1	23	3,923	20	3,943
Perris North	14	8	22	5,609	1,900	7,509
Perris South	10	1	11	2,286	30	2,316
S.J. Lower Pressure	3	3	6	275	70	345
Menifee	4	7	11	719	3,820	4,539
Hemet South (partial)*	1	1	2	80	10	90
Total	54	21	75	12,892	5,850	18,742

*Only a small portion of the Hemet South Management Zone is within the West San Jacinto Groundwater management Area. The remaining portion is within the Hemet/San Jacinto Management Zone and included in figure 3.2.

Desalters

As part of the West San Jacinto Groundwater Management Plan, EMWD has implemented a Groundwater Salinity Management Program. This program consists of three desalination facilities, two that are constructed and one that is in planning and design. These facilities recover high TDS water in the Menifee and Perris South Groundwater Management Zones for potable use. In addition to being a source of water, the main role of the desalter is to play a part in managing the groundwater sub-basins by addressing the migration of brackish groundwater into areas of good quality groundwater.

The Menifee Desalter was the first of three desalters to be built. This facility began producing potable water in 2003. In 2004, the Menifee Desalter produced 1,441 AF of potable water using water from two production wells. A third well began production and will increase the output of the desalter in 2005.

The second desalter, the Perris Desalter, is located next to the Menifee Desalter at the Sun City Regional Water Reclamation Facility. This plant was completed in spring of 2005 and will increase production of desalinated water from 3 to 7 MGD.

The final desalter, currently under design, is the Perris II Desalter. As part of design, four test wells have been drilled. Initial tests of the wells indicate production rates between 750 and 1,000 GPM with TDS concentrations between 2,000 and 3,000 mg/L. It is anticipated that the test wells and transmission lines for the Perris II Desalter will be completed in spring of 2006.

Groundwater Pumping Rights

In the eastern portion of the Hemet/San Jacinto area, EMWD's groundwater production is currently constrained by the 1954 Fruitvale Judgment and Decree. Under that Judgment and Decree, EMWD, as successor-in-interest to the Fruitvale Mutual Water Company, may extract the subsurface waters of the Canyon Basin for use over or outside the Entire Basin without restriction as long as the static water level in a specific well is not over 25 feet below a specific elevation. If the water level in the well is more than 25 feet below the specified elevation, EMWD's extraction is limited to 4,500 AFY. The District may extract from the entire basin a total of not more than 12,000 AFY for use outside the basin for use over the entire basin, subject to the 4,500 AFY Canyon Basin extraction limit. The perimeters of the areas of the Canyon and entire basins are defined in the Judgment and Decree. The Hemet/San Jacinto area contains good quality water and is a major source of municipal as well as private production, although water levels are in serious decline. Once the Hemet/San Jacinto Stipulated Judgment is in effect, it will supercede the Fruitvale Judgment and Decree.

West of the Hemet/San Jacinto area, the West San Jacinto Groundwater Basin Management Plan was adopted in 1995. This 250 square mile area is experiencing increasing water levels due to high TDS groundwater and decreased production. The high TDS groundwater is migrating into the Lakeview portion of the Lakeview/Hemet North management zone, an area of good quality groundwater. Lowering groundwater levels and removal of saline groundwater is an integral element in the West San Jacinto Groundwater Basin Management Plan. Continued operation of the Menifee Desalter and construction of the Perris I and Perris II Desalters was recommended in the West San Jacinto Groundwater Basin Management Plan 2003 Annual Report on the Status of the Sub Basins. Increasing production of usable groundwater, and production of brackish groundwater for desalination, and blending continue to be elements of the management plan.

EMWD is committed to maintaining the stability of the basins through cooperative groundwater management programs that provide a forum and mechanism whereby local groundwater producers may jointly work to ensure basin quality and quantity.

Past Production
Water Code 10910 (f)(3)

Table 3.4 depicts the total potable groundwater pumped by EMWD from 2000 to 2004. The majority of EMWD's groundwater is pumped from the Hemet and San Jacinto area. The remaining groundwater is pumped from the area covered by the West San Jacinto Groundwater Basin Management Plan. Production from the desalter did not begin until 2003. The location of wells used to pump groundwater and the desalters can be seen on Figure 2.1

Table 3.4 - Amount of Groundwater Pumped – AFY

Basin Names	2000	2001	2002	2003	2004
Hemet/San Jacinto Basin EMWD	17,458	17,717	15,126	15,370	12,516
Hemet/San Jacinto Basin Watermaster	0	0	0	0	0
West San Jacinto Basin	3,381	3,262	3,487	3,880	4,049
West San Jacinto Basin Desalters	0	0	0	282	1,441
Total	20,839	20,979	18,613	19,532	18,006

Projected Production
Water Code 10910 (f) (4)

Table 3.5 lists the amount of potable groundwater that EMWD is projecting will be supplied. Groundwater production in the San Jacinto Valley, some of which is currently covered by the Fruitvale Judgment and Decree, will decrease when the water management plan is put into place. The Perris/Moreno Valley wells are projected to continue to produce 6,000 AF. The desalters will decrease salinity in the basin with the added benefit of providing a source of potable water. The well locations shown in Figure 2.1 should remain consistent in the future.

Table 3.5 - Amount of Groundwater Projected to be Pumped - AFY

Basin Names	2005	2010	2015	2020	2025	2030
Hemet/San Jacinto Basin EMWD	12,000	7,200	7,200	7,200	7,200	7,200
Hemet/San Jacinto Basin Recovered Water	0	5,600	6,600	6,400	6,200	6,200
West San Jacinto Basin	6,000	6,000	6,000	6,000	6,000	6,000
West San Jacinto Basin Desalters	3,600	7,500	12,000	12,000	12,000	12,000
	23,605	28,310	33,815	33,620	33,425	33,430
Total	**17%**	**17%**	**17%**	**15%**	**14%**	**13%**

Section 4 – Reliability of Supply

EMWD delivers water to its customers from three sources; imported water from MWD, groundwater from the San Jacinto Basin and recycled water. The Regional Urban Water Management Plan developed by MWD assures the reliability of imported water supply to its member agencies through a multiple-year drought or single dry year through 2030. The management plans and recharge efforts help insure that the San Jacinto basin remains reliable, and the supply of recycled water will only grow as the population increases. The tables below display the anticipated available water supply in normal, dry and multiple dry years.

Table 4.1 - Supply Reliability Average Year - AFY

	2005	2010	2015	2020	2025	2030
Current Supplies						
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,700	10,950	13,300	15,750	17,500
Recycled Water - Agricultural Use	21,500	17,700	17,500	17,500	17,500	17,500
Imported Water Sources						
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	73,900	72,600	78,200	94,700	88,800	116,800
MWD Untreated AG	2,500	1,200	2,100	2,600	3,100	3,500
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,000	8,250	9,500	10,750	12,000
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources						
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	8,000	20,000	22,200	22,600	22,600	22,500
Total	139,000	168,800	195,000	215,800	213,900	245,200
% of Normal	100%	100%	100%	100%	100%	100%

Table 4.2 - Supply Reliability Single Dry Year (AFY)

	2005	2010	2015	2020	2025	2030
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,800	11,100	13,400	15,900	17,700
Recycled Water - Agricultural Use	23,700	19,500	19,300	19,300	19,300	19,300
Imported Water Sources	0	0	0	0	0	0
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	74,700	73,700	79,500	96,100	108,300	118,400
MWD Untreated AG	2,800	1,300	2,300	2,900	3,400	3,900
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,100	8,300	9,600	10,900	12,100
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources	0	0	0	0	0	0
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	6,900	20,000	22,200	22,600	22,600	22,500
Total	141,100	171,900	198,400	219,400	235,800	249,200
% of Normal	101%	102%	102%	102%	102%	102%

Table 4.3 - Multiple Dry Years Supply Reliability (AFY)

Ending in	2005	2010	2015	2020	2025	2030
Current Supplies						
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,800	11,100	13,400	15,900	17,700
Recycled Water - Agricultural Use	23,700	19,500	19,300	19,300	19,300	19,300
Imported Water Sources						
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	74,700	73,700	79,500	96,100	108,300	118,400
MWD Untreated AG	2,800	1,300	2,300	2,900	3,400	3,900
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,100	8,300	9,600	10,900	12,100
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources	0	0	0	0	0	0
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	5,600	20,000	22,200	22,600	22,600	22,500
Total	139,800	171,900	198,400	219,400	235,800	249,200
% of Normal	101%	102%	102%	102%	102%	102%

Imported Water

As EMWD prepares its 2005 UWMP, MWD is preparing a Regional UWMP (RUWMP). This document provides information about MWD supply reliability and demand calculations. The information supplied in the RUWMP provides assurance that MWD will have a reliable water supply available to deliver to EMWD through 2025, even during dry periods mimicking historical patterns. The RUWMP is available through contacting MWD or on MWD's website.

MWD's Board of Directors has developed the following mission statement **"***To provide its service area with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way."* To fulfill their mission, MWD has taken a coordinated approach to regional planning through the Integrated Resources Plan (IRP). The IRP 2003 Update is available through contacting MWD or on MWD's website.

The IRP was first implemented in 1996. MWD and member agencies worked together to first gather and analyze data to determine demand and supply alternatives, then to use the information gathered to develop a diverse mix of resources. The plan ensured MWD and member agencies would meet all full-service demands without interruption through 2020. It set targets for conservation, local supplies, SWP supplies, CRA supplies, groundwater banking, and water transfers. Using a diverse mix of resources, MWD and its agencies reduced dependency on any single water supply resource.

In 2001, MWD began the process of updating its IRP. The goal was to review and measure achievements since 1996, to identify changed conditions and make adjustments and to extend the planning period to 2025. After extensive cooperation with member agencies and other organizations, the plan was adopted in July of 2004. The update found several changed conditions and extended the reliability to 2025.

Significantly changed conditions listed in the 2003 Update were higher conservation savings, Board-revised goals for the SWP and the CRA, more stringent water quality laws and risk in resource implementation. Two areas of concern are the increasingly stringent water quality regulations and the risk associated with implementing planned projects. To manage those and other areas of concern, the IRP Update institutes a planning buffer of up to 10% of regional demands. This buffer calls for MWD to develop 500,00 AF of supply in addition to resource targets by 2025. This supply buffer is developed through increased targets for local supply and an increase of supply from Central Valley transfers. The supply buffer is part of MWD's practice of developing supply at least ten years in advance of need. More information on the IRP is included in Section II.1 of the RUWMP.

To evaluate the reliability of the supply, MWD has developed a computer model named IRPSIM. This model uses historic hydrologic data from 1922 to 1991 to develop estimates of water surplus and shortage over a 20-year planning horizon. The model assists staff in developing a strategy that balances risk and cost and allows them to manage water supplied from multiple sources. There are two basic types of supply. Core supplies include recycled water projects, safe-yield groundwater extraction, and CRA base supplies. These sources supply water to MWD every year. Flexible supplies only provide water when needed. Examples of flexible supplies are voluntary water transfers and storage. Tables 4.4 to 4.6 summarize the results from the IRPSIM model studies performed to test the supply reliability of the resources mix adopted in the IRP. The results are given for a multiple dry year's scenario using hydraulic data from 1990-92, a single worst case dry year using 1977 historic hydraulic data, and for an average year. The IRPSIM analyze shows that MWD is 100% reliable under dry conditions for the period from 2010 to 2030.

More information on the IRPSIM Modeling is Section 2 of the IRP Update. Water supply reliability is also discussed in Section II.3 and appendix A-3 of the RUWMP.

Table 4.4 – Basis of Water Year Data

Water Year Type	Base Year	Historical Sequence
Normal Water Year		1992-2004
Singe-Dry Water Year	1977	
Multiple –Dry Water Year	1990-1992	

Table 4.5 – Average Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	711,000	678,000	677,000	677,000	677,000
California Aqueduct	1,772,000	1,772,000	1,772,000	1,772,000	1,772,000
In-Basin Storage	0	0	0	0	0
Supplies Under Development					
Colorado River Aqueduct	0	0	0	0	0
California Aqueduct	185,000	185,000	240,000	240,000	240,000
In-Basin Storage	0	0	0	0	0
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Firm Demands on Metropolitan	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
Potential Reserve & Replenishment Supplies	628,000	547,000	665,000	539,000	405,000

Table 4.6 - Dry Year Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	722,000	699,000	699,000	699,000	699,000
California Aqueduct	777,000	777,000	777,000	777,000	777,000
In-Basin Storage	840,000	838,000	808,000	784,000	784,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	259,000	350,000	350,000	350,000
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,842,000	3,101,000	3,102,000	3,078,000	3,078,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,842,000	3,033,000	3,002,000	2,970,000	2,970,000
Firm Demands on Metropolitan	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
Potential Reserve & Replenishment Supplies	549,000	732,000	768,000	607,000	481,000

Table 4.7 - Multiple Dry Year Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	722,000	699,000	699,000	699,000	699,000
California Aqueduct	912,000	912,000	912,000	912,000	912,000
In-Basin Storage	482,000	480,000	463,000	449,000	449,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	215,000	299,000	299,000	299,000
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,619,000	2,741,000	2,741,000	2,719,000	2,719,000
Firm Demands on Metropolitan	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
Potential Reserve & Replenishment Supplies	243,000	377,000	424,000	265,000	132,000

In April of 1999, MWD adopted the Water Surplus and Drought Management Plan (WSDM Plan). This plan provides guidelines for managing water resources to achieve the reliability goals of the IRP. The guiding principle of the WSDM Plan is to manage MWD's water resources and programs to maximize management of supplies in wet years and minimize adverse impacts of water shortages to retail customers. MWD does this, in part, through encouraging efficient water use and economical local resource programs, coordinating with sub agencies to make surplus water available in dry years, pursuing transfer and banking options, and increasing public awareness about water supply issues. MWD fully expects to be 100% reliable for delivery of non-discounted, non-interrupted demands through 2025. If any allocations should become necessary, those allocations will be based on need, as opposed to any historical purchases. Further discussion of the WSDM Plan is included in Section 11.4 of the RUWMP.

EMWD participates and supports MWD's efforts to ensure reliability. One of the resource programs EMWD is constructing, Reach 16, is co-funded by MWD. Reach 16 is a recycled water pipeline that will remove 720 AF of potable water demand from the system and replace it with recycled water. EMWD is also using surplus SWP water to recharge the San Jacinto Basin so that there will be groundwater available to meet demands during dry years.

Based on the information detailed in MWD's RUWMP, EMWD is confident that MWD will provide EMWD with enough non-discounted, non-interrupted water supplies to meet demands through 2030. EMWD's only interruptible supply is discounted agricultural water, which accounts for approximately 4% of the District total supply, and the recharge water used for the San Jacinto Basin. It is anticipated that recharge water may not be available in one out every five years. If there is a shortage of imported water that cannot be supplemented by local supplies, EMWD will make up the deficiency by implementing the water shortage contingency plan.

Groundwater

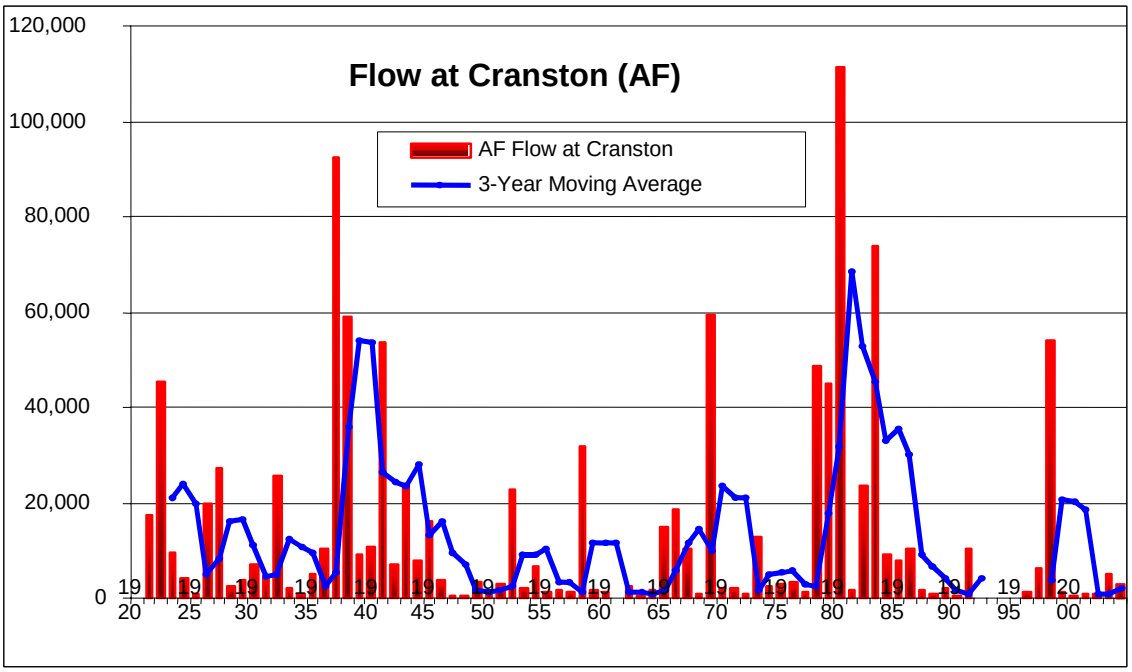
EMWD's 550-square mile service area spans two watersheds, the San Jacinto in the north and the Santa Margarita River in the south. In the San Jacinto Watershed, the Hemet/San Jacinto area to the east occupies about 23% of the District, and the West San Jacinto Groundwater Management Plan area to the west occupies approximately 49% of the District. The Santa Margarita River watershed portion of the District to the south covers approximately 28%.

Hemet/San Jacinto Area

Groundwater is, and historically has been, the primary source of supply in the Hemet/San Jacinto area. In 2004, 83% of EMWD's demand in the area was supplied by groundwater, while 17% was supplied by imported water. Twelve of sixteen active wells in the Hemet/San Jacinto area produced more than 12,500 AF of water during 2004.

Groundwater supplies are dependent upon precipitation locally, as well as in the mountains, to provide flow in the San Jacinto River to recharge the basins. The U.S. Geological Survey has maintained a gauging station at Cranston Ranger Station on the San Jacinto River for all but four years since 1920. The following figure shows annual San Jacinto River flow along with a three-year moving average.

Figure 4.1: - Annual San Jacinto River Flow



Based on data from the USGS gauging station, the following have been identified and defined:

Table 4.8 - Normal, Single-Dry, and Multiple-Dry Years

Term	Definition	Year(s)	Flow (AF)
Normal Year	Median Runoff Level (1920 through 2004)	1946	3,775.53
Single-dry Year	Lowest Annual Runoff for Watershed	1920	73.19
Multiple-dry Year Period	Lowest Average Runoff for three Consecutive Years	2000/02	714.69

During both Single- and Multiple-dry years, EMWD met customer demands without interruption of service.

An analysis of hydrologic reliability was conducted based on the 2000-2002 Multiple-Dry Year Period using data from three EMWD production wells in the Canyon and three in the Intake portion of San Jacinto Upper Pressure Management Zone. The results are shown in the following table:

Table 4.9 - Results of Hydrologic Reliability Analysis (Decline in Water Levels is in Feet and Depths to Water or Screens are in Feet Below Ground Surface)

	Area:	Canyon			SJUP Intake		
	Well:	# 17	# 26	# 34	# 18	# 27	# 28
1	Decline in Water Levels (Depth to Water) following 2000/02 Dry Period	142	152	144	85	64	86
2	Depth to Water as of June 2005	194	196	198	419	359	430
3	Projected Depth to Water Following Another Dry Period Similar to 2000/02	336	348	342	504	423	516
4	Depths of Lower Limit of Well Screens	1,122	1,460	1,050	1,000	1,676	1,480

Given current conditions, even if another multiple-dry year period produces a decline in water levels similar to that produced in 2000-2002, the wells will still be operable and capable of producing. The basin may become over drafted, but production would continue.

Groundwater management is an important element in maintaining water reliability. In the Hemet/San Jacinto area, the water purveyors and local groundwater producers have been working to put a water management plan in place. In the Principles for Water Management, each agency - EMWD, Lake Hemet Municipal Water District, and the Cities of Hemet and San Jacinto - agreed to a methodology for determining their base production rights. It is the goal of the Management Plan to adjust base production rights over time to a level consistent with the calculation of the agencies' share of safe-yield for the management area. After plan implementation, the agencies will be subject to replenishment of water pumped in excess of their adjusted base production right.

In the meantime, prior to plan implementation, the agencies agreed to address the deteriorating situation in the sub-basins and to reduce the historical impact of overdraft caused by past groundwater production. The Interim Groundwater Recharge Program involved the application of approximately 6,000 AF of SWP recharge during 2004 at two existing recharge pond sites located in the San Jacinto Riverbed. The water was recharged and funded under the 2004 Interim Water Supply Plan. An additional 778 AF was recharged in 2004 in anticipation of the execution of a similar MOU for 2005. That MOU was executed and provides for up to 8,000 AF of recharge, which is currently underway.

West San Jacinto Groundwater Management Plan Area

Groundwater plays a lesser role in the West San Jacinto Groundwater Management Plan area. In addition, groundwater supplies in the West San Jacinto area are not dependent upon San Jacinto River flows. Imported water accounted for 53,000 AF or more than 90% of the area's demands. During 2004, five production wells produced 4,050 AF of water and three desalter wells produced 1,990 AF of brackish groundwater for the desalination plant. If, due to drought or some other cause, groundwater supplies were not available, EMWD would first try to meet its customer's demands through imported water. If imported water were not available, then the Water Shortage Contingency Plan would be implemented.

Santa Margarita Watershed

EMWD serves and wholesales imported water in the portion of the Santa Margarita River Watershed that falls within District boundaries. Groundwater does not play a role in EMWD's efforts in this area.

Recycled Water

EMWD operates and maintains four regional water reclamation facilities and all are currently undergoing or planning an expansion. These facilities treat water collected in EMWD's wastewater system for use as recycled water. As the service area population grows, the supply of recycled water continues and as land becomes less available for agriculture, there is a greater supply of recycled water available for municipal and industrial purposes. EMWD's recycled water supply is not dependent on weather patterns and may actually increase slightly in dry years. Wet years, at times, will pose a greater operational challenge as storage facilities fill and customer demand decreases.

Section 5 - Transfers and Exchanges

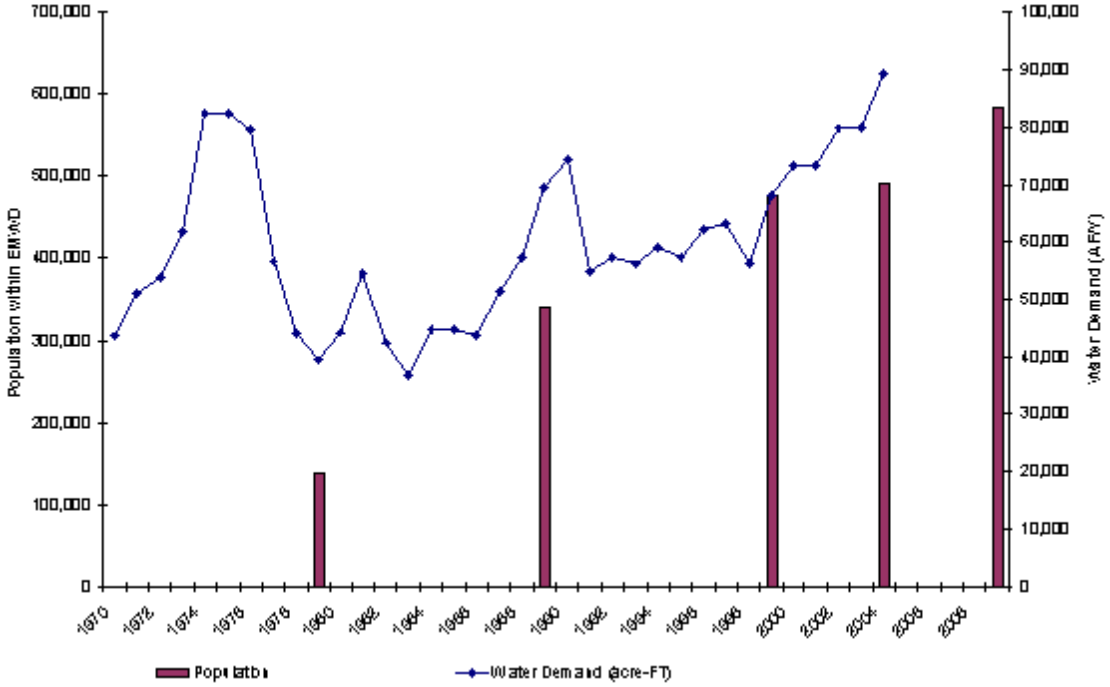
EMWD currently relies on Metropolitan Water District of Southern California (MWD) for any transfers or exchanges. As a member agency, EMWD benefits from MWD's efforts to improve supply reliability through transfers and exchanges detailed in the 2005 Regional Urban Water Management Plan.

In addition to relying on MWD, EMWD is investigating opportunities for independent transfers and exchanges. A consultant has been hired and is actively researching the possibility of cost-effective transfers and exchanges for EMWD. Since there is no guarantee that exchanges or transfers will be feasible for EMWD, and its impossible to quantify the amount of water that could be made available, transfers and exchanges are not listed as part of EMWD water supply.

Section 6 - Water Use by Customer Type

Since the last UWMP published in 2000, EMWD has experienced a period of accelerated growth. The number of customer meters has jumped to over 100,000, the majority of them in new single-family homes. In the past, water demand has remained relatively constant despite large jumps in population growth. Declining agricultural demand has offset the increasing domestic demand. Now, agricultural demand is relatively stable and the domestic market continues to grow. Even the recycled market is starting to shift from agricultural to other uses. For the last five years, population growth has driven up water use and it is expected to do so for the foreseeable future. The chart below tracts water sales compared to population from 1970 to 2004.

Figure 6.1 – Population Growth vs. Water Demand



More and more of the land in EMWD's service area is shifting away from open space and agriculture. EMWD maintains a Database of Proposed Projects (DOPP). This data base tracts major developments from planning through construction. The database is continually updated and revised as projects reach different stages of development. Currently, there are approximately 651 proposed projects on over 56 thousand acres within EMWD's service area. These projects would create nearly 150,000 new residential units and over 10,000 acres of commercial, industrial, institutional, parks, open space or other non-residential development. This database contains projects that may not be developed for years or even decades. EMWD uses population projections from the Southern California Association of Governments 2004 Transportation Analysis study to determine local absorption studies and information contained in the DOPP to determine its population growth from 2005 to 2025.

Retail Market Segments

EMWD has several different water markets. EMWD's primary customers are retail purchasers of potable water. These customers can be divided into residential, commercial, industrial, institutional and landscape sectors. Although the residential section is by far EMWD's largest customer segment, each market segment plays a role in the growth and development of EMWD's service area. See table below for the water use by various customer types.

Table 6.1 - Water Use by Customer Type-AFY

Year	Water Use Sectors	Single Family	Multi-Family	Com-mercial	Indus-Trial	Instit-Gov	Land-scape	Agri-Cultural	Total
2000	# of accounts	82,459	831	978	101	229	1041	413	86,051
	Deliveries	45,536	4,458	3,018	433	2,250	5,675	7,029	68,399
2005	# of accounts	108,956	1,098	1,292	133	302	1,375	185	113,341
	Deliveries	65,951	6,456	4,372	627	3,,258	8,220	3,152	92,036
2010	# of accounts	128,575	1,312	1,525	157	357	1,623	165	133,715
	Deliveries	74,764	7,414	4,957	710	3,695	9,321	2,776	103,637
2015	# of accounts	149,105	1,548	1,768	182	413	1,881	143	155,039
	Deliveries	87,419	8,814	5,792	830	4,317	10,891	2,403	120,466
2020	# of accounts	166,950	1,754	1,974	203	461	2,101	122	173,565
	Deliveries	98,535	10,058	6,512	933	4,853	12,244	2,048	135,183
2025	# of accounts	180,753	1,917	2,131	219	498	2,268	122	187,907
	Deliveries	106,503	10,970	7,017	1,006	5,230	13,194	2,048	145,968
2030	# of accounts	191,804	2,052	2,255	232	527	2,400	122	199,392
	Deliveries	112,958	11,737	7,423	1,064	5,533	13,957	2,048	154,720

In addition to potable sales to retail customers, EMWD also sells water to agricultural customers and wholesales water to other agencies. Although agricultural sales have greatly declined from historical numbers, agriculture remains an important part of EMWD's market. Water sales to other agencies are one of EMWD's most volatile demands. The need for EMWD's water can fluctuate every year due to a number of factors.

In addition to potable water sales, EMWD has an active and growing recycled water market. Using recycled water for landscaping and agricultural uses whenever possible allows EMWD to reduce its dependence on imported potable water.

Although their needs and size vary, EMWD is committed to providing water to support the people living and working within the District's 555 square mile service area.

Retail Sales of Potable Water

Residential

Residential use is, and will continue to be, the dominant demand for EMWD. According to the Riverside County Integrated Plan (RCIP), the ultimate land use will be primarily residential. Residential land use can be divided between low, medium and high residential development. Land use with between 0.05 and 3 structures per acre is considered low-density. Low-density residential accounts for over half of the residential land use. Low-density is focused in areas with steep terrain and geographical limitations to higher density land use. Although low-density accounts for over half of the residential land use, it only accounts for 20% of the total demand for water.

Medium-density residential is the second highest residential land use. Medium-density land use has between 4 and 8 dwelling units per acre and will account for more than half of the water demand at build out. Although there is less land dedicated for medium-density residential use in EMWD, the higher rate of water use per acre leads to higher water demand for medium-density residential customers. Much of the development currently occurring in EMWD's boundary is medium-density residential. Large tracts and specific plans are replacing rows of agricultural crops with rows of new housing throughout EMWD.

High-density residential accounts for the smallest area of residential land use. High-density residential has more that eight dwellings per acre and is usually multi-family. High-density residential includes apartments, town homes and condominiums. EMWD is starting to see an increase in the number of high-density projects being built in areas that are already densely populated. As land use within EMWD's services area continues to move from open space and agriculture, high-density residential development will continue to grow.

Commercial Sector

The commercial sector will also continue to grow as the population increases, according to the RCIP. Commercial development will be focused along the major transportation highways through EMWD's boundary - Interstate Highway 15, Interstate Highway 215, Highway 79, and Highway 74. Currently, commercial demands account for about 5% of EMWD's retail sales. According to the RCIP, ultimately, commercial demand will account for 8% of retail sales. This indicates that the commercial sector will continue to grow at nearly the same rate as the population.

Industrial Sector

EMWD has a very small industrial sector, less then 1% of retail demand. As the District grows, there may be a higher rate of industrial growth. The RCIP indicates that ultimate industrial demand may account for up to 4% of EMWD's retail market. Industrial growth will be focused mainly around Interstate Highway 215, when it occurs. As much as possible, EMWD will try to meet the needs of any industrial customers with a very high demand for water using recycled water.

Institutional/Governmental Sector

EMWD has a stable institutional sector that will grow with the population. Currently, the demand from institutional customers accounts for about 4% of retail demand for potable water. The RCIP predicts about 3% of the ultimate water demand will be for public facilities. Whenever possible, recycled water is used for landscape irrigation for schools and other government facilities.

Agricultural Sales – Potable Water

When EMWD was formed, it was primarily to serve the agricultural community with imported water from MWD. Since then, the District has gone through a major transformation from a farming community to a residential community. Currently, agricultural sales account for only about 4% of EMWD's potable water market. This is expected to remain relatively stable for the next twenty years with some fluctuations from year to year due to changes in weather or crop rotations.

Reduction of Retail Demand through Conservation

As EMWD's demographics change and the population grows it is important that every effort is made to reduce water demand through conservation. Already the amount of water needed for the thousands of new homes being built is reduced through plumbing codes implemented in the early 1990's. Low flow toilets and showerheads are mandatory in all new construction. As seen in table 6.2 below, this passive conservation through plumbing codes has already reduced EMWD's demand significantly and will continue to do so in the future. In addition to passive programs, EMWD has implemented all of the California Urban Water Conservation Council (CUWCC) Best Management Practices (BMP). The BMPs and other active conservation programs also reduce EMWD's current demand and will continue to decrease it in the future. These existing practices and laws allow EMWD to project demand lower then it would without these conservation measures.

The demand projected in Table 6.1 assumes that existing conservation laws and programs will remain in place or be replaced with similar efforts. However, EMWD is not content to rely on the existing conservation programs and law. One of EMWD's strategic objectives is to "Promote efficient use of water and implement a structured conservation plan." EMWD is currently developing a conservation plan to reduce water consumption per capita and participating in pilot protects and programs. The continued promotion of conservation through new rebates, programs and education will only continue to reduce demand.

Table 6.2 – Conservation Savings – AFY

	2000	2005	2010	2015	2020	2025	2030
Retail Demand	61,400	92,000	10,3600	120,500	135,200	146,000	154,700
Active Conservation	1,100	1,800	2,600	3,300	4,000	4,700	5,000
Passive Conservation	600	2,800	5,000	7,200	9,200	10,600	11,300
Demand without Conservation	63,100	96,700	111,200	131,000	148,300	161,300	171,000

Wholesale to Other Agencies

EMWD wholesales water to six different agencies. The demand for each agency differs based on its need each year. These demands can be unstable at times as other water districts use water from EMWD to supplement their system when local facilities are inadequate or fail. The majority of wholesale water is delivered to agencies in the Hemet/San Jacinto area. This demand should decrease while needs are met through the recharge and recovery plan. As the population continues to grow and native groundwater production is curtailed, imported water through EMWD will become the supplemental supply for all new growth.

A portion of the water EMWD wholesales to Lake Hemet Municipal Water District is raw water for agricultural uses. This water is needed especially when surface water is not available in dry years. Planning is underway to meet a portion of these agricultural needs with recycled water in the future. See the table below for water sales to other agencies.

Table 6.3 - Sales to Other Agencies – AFY

Sales to Other Agencies	2000	2005	2010	2015	2020	2025	2030
Lake Hemet MWD Ag Water	1,667	2,545	1,200	2,100	2,600	3,100	3,384
Lake Hemet MWD		300	0	0	0	0	0
City of Hemet Water Dept.	591	259	0	0	0	0	0
San Jacinto Water Dept.	0	222	0	0	0	0	0
City of Perris	1,977	2,500	2,641	2,722	2,757	2,769	2,773
Murrieta Water County Dist.	0	300	0	0	0	0	0
Nuevo Water Company	36	775	1,002	1,457	1,745	1,903	1,979
Total Untreated AG	1,667	2,545	1,200	2,100	2,600	3,100	3,384
Total Potable	2,604	4,578	3,643	4,179	4,502	4,672	4,752

Other Water Uses

EMWD has several additional water uses, water used for recharge, recycled water use and water losses. See Table 6.4, for the projected use of water by each type.

Table 6.4 - Other Water Uses - AFY

	2000	2005	2010	2015	2020	2025	2030
Recharge Water	0	8,000	20,000	22,200	22,600	22,600	22,500
Recycled - Industrial Enterprise and Aesthetic Improvement			7,000	8,250	9,500	10,750	12,000
Recycled – Municipal	3,500	3,500	7,700	10,950	13,200	15,750	17,500
Recycled – Agriculture/Wildlife Habitat		21,500	17,700	17,500	17,500	17,500	17,500
System Losses	3,959	6,930	7,900	9,400	10,600	11,600	12,700
Total	7,459	39,930	60,300	68,300	73,500	78,200	82,200

Recharge Water

Under the Hemet/San Jacinto Water Management Plan, EMWD will be responsible for transporting raw water from EM-14 to ponds in the San Jacinto riverbed to recharge the groundwater basin. The SPW imported through MWD will meet the requirements of the Soboba Settlement and improve the reliability of groundwater in the area. After the water is added to the basin, individual agencies including EMWD will extract their allotted amount of water from the basin using wells already in place and new wells yet to be constructed.

Recycled Water

There are three main types of recycled water; 1) municipal customers, 2) agricultural/wildlife habitat customers, and 3) customers using recycled for industrial purposes or aesthetic impoundments. Municipal customers use recycled water for irrigating landscaping. These customers have made a financial investment in the landscape or process that requires water. Without recycled water available, these customers would pay for imported potable water or pump groundwater to protect their investment. It is anticipated that the demand from these customers will increase with population growth and system expansion. Each customer will have a fairly consistent demand each year, with minor fluctuations due to weather. Recycled water use by these customers reduces the amount of potable water that needs to be extracted from groundwater or imported through MWD.

Some agricultural customers often use recycled water to grow short-term row crops. Using potable water would not be cost-effective for these customers. Their profitability is based on the availability of low-cost recycled water and low-cost land available for lease. The location of these customers frequently changes each year depending on where there is land available. As more residential development takes place and the population grows, land is becoming less accessible. As time goes by, EMWD expects to have fewer and fewer of these types of customers. Other agricultural customers use recycled water to irrigate crops that require a long-term investment such as citrus trees. These customers would use potable water if needed to protect their investment. Because potable water has a prohibitive cost, recycled water is also used to support the San Jacinto Wildlife Area.

One final type of recycled water customer is the customer using recycled water for industrial processes or aesthetic impoundment. These customers would not use potable water either because it is not economically feasible or because EMWD policy would not allow it.

The future of EMWD's recycled water market is with municipal customers, customers using recycled water for industrial processes or aesthetic impoundment and long-term agriculture customers. To meet the needs of these customers, EMWD is taking steps to improve the reliability and quality of the recycled water system.

EMWD also sells water to the California Department of Fish and Game for the San Jacinto Wildlife Area. This wildlife refuge was one of the first in the state to use recycled water for habitat creation and recycled water is used to help maintain, enhance and improve this environmental preserve. EMWD is working with the Department of Fish and Game and other interested parties to expand and enhance the use of recycled water for environmental benefits at the San Jacinto Wildlife Area.

Water Losses

EMWD's final water use type is water losses. Water losses account for less than 7% of total water use. Through leaky pipe tracking and replacement, EMWD is continually trying to decrease the water loss rate.

All Use

The sum use of EMWD's water use is seen in the table below.

Table 6.5 - Total Water Use - AFY

	2005	2010	2015	2020	2025	2030
Total Water Use	139,000	168,800	195,000	215,800	231,900	245,200

Section 7 – Conservation

Under EMWD's Strategic Plan, the District is seeking to "*Promote efficient use of water and implement a structured conservation program*." To do this, EMWD is actively working with other agencies and its customers to reduce the amount of water demand placed on groundwater and imported sources. The goal is to reduce our per capita water use rate by 25% over the next twenty years through promoting programs, offering rebates, educating customers and minimizing water loss from EMWD facilities. Two groups that EMWD works closely with to improve conservation efforts are Metropolitan Water District of Southern California (MWD) and the California Urban Water Conservation Council (CUWCC).

Metropolitan Water District of Southern California

EMWD's work with MWD on conservation savings is important for two reasons. First, MWD uses projected conservation savings as part of its calculations when determining supply reliability. Second, MWD is a funding source for many of the conservation programs EMWD implements. Additional information about MWD's conservation program is included in Section II.2 of the RUWMP.

Projected Water Savings

A core element of MWD's water supply plan is conservation. One of the changed conditions in the 2003 Integrated Resource Plan (IRP) update was an increase in conservation savings causing a drop in demand compared to the 1996 IRP. The 2003 update to the IRP had a target for conservation of 1,107,000 AF of savings in 2025. This target was developed using specially designed computer models created to tackle the complex measurement of conservation savings.

In MWD's model, four types of conservation savings are considered:

1) **Active conservation savings** are a result of agency funded or sponsored programs.
2) **Passive conservation savings** are the result of the 1992 California Plumbing code.
3) **Price-effect conservation savings** are due to increases in retail water rates since 1990.
4) **Pre-1990 conservation savings** are from the 1980 California Plumbing code and from price effects from 1980 to 1990.

For "active" conservation savings, MWD takes a regional approach for any conservation that may be implemented in the future. There is not a specific target for each agency but MWD works with all of the sub agencies within its service area to meet conservation goals. Much of EMWD's conservation program has received supplemental funding from MWD and EMWD is continually working with MWD to find new opportunities for water use efficiency.

Because EMWD experienced so much growth after 1992, the majority of the MWD projected conservation savings in EMWD's service area is due to pre-1990 savings, price effects and passive savings from the plumbing codes. Only about 7% of the total projected conservation savings are achieved through the active conservation programs already in place. Since MWD's savings projections are based on savings from plumbing

codes and programs already in place, any additional conservation activities EMWD undertakes will only decrease the reliance on the imported water supply from MWD.

California Urban Water Conservation Council

The CUWCC was created to increase efficient water use throughout the State of California through partnership with urban water agencies, public interest organizations and private entities. The goal of the council is to integrate urban water best management practices (BMPs) into the planning and management of California's water resources. In 1992, EMWD signed CUWCC's Memorandum of Understanding Regarding Water Conservation in California (MOU). By signing the MOU, EMWD committed to developing and implementing fourteen comprehensive BMP's for urban water management. EMWD submits a biennial report to CUWCC describing the status of each BMP. Included as Appendix C are the CUWCC BMP Reports for 2002/2003 and 2003/2004. The BMP's correspond to the fourteen Demand Management Measures listed in Water Code Section 10631 (f).

Best Management Practices

Water Survey Programs for Single – Family Residential and Multi-Family Customers

EMWD has offered free residential water use surveys of its customers since 1991. These surveys examine both indoor and outdoor water uses. They measure flow rates in showers and toilets, check for leaks, recommend water saving devices, check landscape areas and review or develop irrigation schedules. At the end of the survey, customers are provided survey results and water saving recommendations. From 1993 to 2004, over 2,000 water surveys were completed. Funding for the residential surveys comes from EMWD and through MWD's Conservation Credits Program. This program meets the requirements of BMP 1.

Plumbing Retrofits

Plumbing retrofits for residential customers are often recommended or installed as part of the residential surveys. In 2004, low flow showerheads, toilet displacement devices, toilet flappers and faucet aerators were distributed to EMWD customers to increase indoor water use efficiency. In addition to indoor water saving devices, several types of irrigation devices were distributed. MWD is a partner in funding retrofits. This program meets the requirements for BMP 2.

Distribution System Water Audits, Leak Detection and Repair

EMWD continually tracks the amount of water sold and the supply entering the system. Every customer has a service meter. This allows EMWD to determine the amount of water that goes unaccounted for each year. The rate of water loss is currently less than 7%; however, EMWD is continually making an effort to reduce those losses. As part of normal operation and maintenance procedures, all leaks reported are investigated and repaired if they are part of EMWD's system. Pipes with numerous leaks are tracked and replaced as part of the Capital Improvement Plan. Pipe inspection is also routinely conducted by maintenance personnel, in order to determine where leaks are occurring. Grant funding opportunities are pursued to assist in funding leaky pipe replacement when possible. This program meets the requirements for BMP 3.

Metering with Commodity Rates

EMWD is fully metered for all customer sectors and all customers pay the sector rate for each billing unit consumed. Irrigation meters are required for all Commercial, Industrial and Institutional (CII) customers with a landscaped area over 3,000 square feet. EMWD also has separate meters for recycled water meters. As new services are added, meters are installed and read. Older meters are calibrated and replaced as needed. Metered accounts may result in a 20% reduction of water demand compared to non-metered rates. This program meets the requirements for BMP 4.

Large Landscape Water Audits and Incentives

EMWD has over 1,300 dedicated landscape meters. Of these meters, nearly 400 are metered accounts with water budgets. The accounts with budgets have 3,000 square feet or more of dedicated landscaping areas. Each account receives a monthly report and graph indicating account status. If a landscaping customer's water use exceeds its budgeted limit, a fine is levied on the customer. It is estimated that approximately 500 AFY are saved through the large landscape program. This program meets the requirements for BMP 5.

High-Efficiency Wash Machine Rebates

EMWD offers its customers a rebate for purchasing high-efficiency washing machines. From 2001 through 2004, EMWD facilitated rebates for 1,079 high efficiency washing machines. In 2004, 553 rebates were issued for eligible washers purchased. Currently, a rebate of $110 is offered for applicable machines. Since July 2005, only washing machines with a water use factor of 6.0 or less are eligible for this rebate. MWD currently contributes $100 towards each washing machine rebate. This program meets the requirements for BMP 6.

Public Information

Public information is an important part of EMWD's conservation program. Information on water conservation is offered through workshops, bill inserts, EMWD's web site, brochures, community speakers, paid advertising and special events every year. EMWD is developing a survey program to track the effectiveness of its public information campaign. Although the benefits of a public information campaign may not be easily measured, EMWD believes it is in the public's best interest. A portion of the public information program is funded through MWD, especially landscape workshops. This program meets the requirements for BMP 7.

School Education

School education is an integral part of EMWD's conservation efforts. Programs are available for students in kindergarten through the twelfth grade. Full-time staff members are employed to reach out to students through educational tours of EMWD facilities, water conservation theater programs presented in an assembly, distributing free water education materials, administrating a "water-wise" poster contest, making classroom presentations and other educational programs. Over 100,000 students were reached in 2004. As the District continues to grow, so will the number of students reached. This program meets the requirements for BMP 8.

Commercial, Industrial, and Institutional Water Conservation

EMWD encourages conservation by commercial, industrial and institutional water customers in several ways. Rebates are a major part of EMWD's outreach to these water customers. Rebates are offered for ultra-low and dual-flush toilets, and urinals up to $140. There is a $100 rebate for water brooms. In addition to the water broom rebate program, EMWD donated a water broom to every school within its service area, 125 brooms in total. There is also a rebate of $500 for cooling tower conductivity controllers that will cut water use up to 40%. Replacing a kitchen sprayer with one that can save water is eligible for a $50 rebate. High-efficiency washing machines receive a rebate of $100 and an X-ray film processor recycling system that reduces water use up to 98% has a rebate of $2,000. Information about all of these rebate programs is readily available to customers on EMWD's web site.

EMWD also offers free guest towel and bed linen placards for hotels and motels, and offers water use surveys to commercial, industrial and institutional customers. For outdoor conservation, any commercial, industrial and institutional customer with landscaped areas larger than 3,000 square feet is part of the large landscape program and on a water budget. MWD provides much of the funding for the rebate offered to commercial, industrial and institutional customers and conducts periodic marketing campaigns for the program. This program meets the requirements for BMP 9.

Wholesale Agency Programs

BMP 10 concerns the actions of wholesale agencies. As a wholesale agency, EMWD encourages each of its sub agencies to participate in rebate programs, and in the past, has worked with individual agencies to promote water conservation in the region. Currently, LHMWD is receiving MWD funds through EMWD for ultra-low flush toilets and washing machines programs.

Conservation Pricing

EMWD has meters for each customer and charges a volumetric rate for water use. By charging each customer for the volume of water used, EMWD encourages customers to reduce water use and therefore the amount paid for water. This rate system meets the requirements of BMP 11.

Conservation Coordinator

BMP 12 concerns a conservation coordinator. EMWD does not have a dedicated conservation coordinator at this time. Instead, a team of three full-time and two part-time employees work together to coordinate conservation programs and BMP implementation, prepare and submit the Council BMP Implementation Report, and communicate and promote water conservation issues to senior staff.

Water Waste Prohibition

EMWD has an Ordinance that provides for special water conservation provisions. Ordinance 72.19 limits the use of potable water for golf courses and aesthetic impoundments. It also has several provisions for conservation ethics for all EMWD customers. Ordinance 72.19 meets the requirements of BMP 13.

Ultra-Low Flush Toilet Replacements

Ultra-low flush toilet replacement has occurred in EMWD since 1993. EMWD offers rebates with funding through MWD, and more than 15,742 toilets were replaced from 1993 to 2004 resulting in approximately 546.5 AF of water saved annually. Recent surveys have found that there is still a significant market for toilet replacement, and EMWD will continue to offer replacement toilets each year. This program meets the requirements of BMP 14.

Demand Management Measures (DMM)

The fourteen best management practices encouraged by CUWCC correspond to the fourteen demand management measures advocated by the State of California. EMWD's actions are detailed in the included CUWCC Reports and these reports meet the requirements set forth by law.

Evaluation of DMMs Not Implemented

EMWD has worked to implement each of the DMMS or BMPs. As detailed in the attached CUWCC reports, all of the DMMs are implemented, and in some cases EMWD has gone beyond the requirements of CUWCC and the Water Code.

Section 8 – Planned Water Supply, Projects and Programs

Proposed Supply Projects and Programs

As the population in EMWD's service area continues to increase, EMWD is planning for the future by aggressively pursuing the completion of new facilities and sources of supply. Not content to depend on MWD for potable water delivered to our boundary lines, EMWD's Capital Improvement Plan (CIP) includes projects for treating raw water and desalting groundwater. EMWD has also taken steps to increase the reliability and the output of the groundwater basins in a safe and responsible manor through integrated recharge and recovery. EMWD is also planning, or already in the process of, expanding each of its regional water reclamation facilities to treat the increased wastewater generated by the growing population thereby supplying additional recycled water. Table 8.1 shows the AFY each proposed project will supply, Table 8.2 gives the schedule for water supply expansion projects from EMWD's CIP.

Table 8.1 - Future Water Supply Projects -AFY

Project Name	Normal Year Supply (AF)	Single Dry Year Supply (AF)	Multiple Dry Years Supply		
			Year 1	Year 2	Year 3
Water					
Perris Desalter II	4,500	4,500	4,500	4,500	4,500
Hemet Microfiltration Plant	8,800	8,800	8,800	8,800	8,800
Perris Microfiltration Plant Expansion	8,800	8,800	8,800	8,800	8,800
IRRP Phase 1	7,500	7,500	7,500	7,500	7,500
IRRP Phase 2	15,000	15,000	15,000	15,000	15,000
Recycled Water					
San Jacinto Valley RWRF Expansion to 14 MGD	3,400	3,400	3,400	3,400	3,400
San Jacinto Valley RWRF Expansion to 18 MGD	4,500	4,500	4,500	4,500	4,500
Moreno Valley RWRF Expansion to 21 MGD	9,000	9,000	9,000	9,000	9,000
Temecula Valley RWRF Expansion to 18 MGD	6,700	6,700	6,700	6,700	6,700
Temecula Valley RWRF Expansion to 22 MGD	4,500	4,500	4,500	4,500	4,500
Perris Valley RWRF Expansion to 22 MGD	12,300	12,300	12,300	12,300	12,300
Perris Valley RWRF Expansion to 30 MGD	9,000	9,000	9,000	9,000	9,000

Table 8.2 - Water Supply Projects Timeline

Project Name	Projected Start Date	Projected Completion Date
Water		
Perris Desalter II	Aug. 2005	Sept. 2008
Hemet Microfiltration Plant	Jan. 2003	Aug. 2006
Perris Microfiltration Plant Expansion	Sept. 2003	Nov. 2006
IRRP PHASE 1	Jan. 2004	Sept. 2006
Recycled Water		
San Jacinto Valley RWRF Expansion to 14 MGD	Oct. 2004	Dec. 2011
San Jacinto Valley RWRF Expansion to 18 MGD	Nov. 2019	June 2024
Moreno Valley RWRF Expansion to 21 MGD	Nov. 2006	Nov. 2009
Temecula Valley RWRF Expansion to 18 MGD	Nov. 2002	June 2006
Temecula Valley RWRF Expansion to 22 MGD	Feb. 2010	March 2015
Perris Valley RWRF Expansion to 22 MGD	Jan. 2005	Feb 2013
Perris Valley RWRF Expansion to 30 MGD	Aug. 2014	Oct. 2018

Desalters

EMWD currently has one desalter producing potable water from high TDS groundwater threatening to contaminate the potions of the West San Jacinto area, and has finished construction and is preparing to begin production at a second desalter. The completion of a third desalter in 2006 will put EMWD at the sustainable capacity of groundwater desalination and supply an increased supply of 4,500 AFY. Currently, the Perris II Desalter is in design and completion is anticipated for April of 2006.

Because the groundwater levels in the basins that supply groundwater for the desalter are rising, a single or even multiple-dry year event would have insignificant effects on the desalter production. Production is projected to remain at the 4,500 AFY rate.

Hemet Microfiltration Plant

In the Hemet/San Jacinto area, the population has outgrown the ability of groundwater alone to meet demand. To offset that demand, EMWD is in the process of constructing a microfiltration plant that will treat unfiltered raw water from the State Water Project (SWP) for potable use in the area. This 8,800 AF plant will depend on MWD for a source of water to treat. MWD has assured its member agencies of its ability to meet demand even during multiple dry years through 2020 and therefore, the production rate of the microfiltration plant will be unaffected by dry weather patterns.

Perris Microfiltration Plant Expansion

Currently, the microfiltration plant in Perris is undergoing an expansion from a capacity of 8,800 AFY to 17,600 AFY. This expansion is expected to be completed in November of 2006. Like the Hemet plant, the Perris microfiltration plant is not dependent on weather patterns and will not be limited in dry years.

Integrated Recharge and Recovery Project

Currently, EMWD uses untreated water from MWD for groundwater recharge in the Hemet/San Jacinto area. To expand that effort and as part of the Hemet/San Jacinto Water Management Plan, EMWD is developing a program of replenishment and recovery that will be implemented in two phases. The first phase will result in the ability to recover 7,500 AFY of water from the basin by 2010. Work on the integrated replenishment and recovery program has been initiated. Since much of the recharge will take place within the San Jacinto River, EMWD is working with the Army Corps of Engineers to prepare an Environmental Impact Statement for the project.

Recycled Water

EMWD owns, operates and maintains four regional water reclamation facilities (RWRF) throughout the District. Each one of these plants will be expanded over the next twenty years to meet the demand of the increasing population. Although the treatment capacity of each plant will be increased, the supply of recycled water will only increase as the population grows. In addition, due to the fluctuation in demand for recycled water throughout the year and the year-round consistent supply of recycled water, there is more recycled water available in the winter than is needed. This leads to seasonal discharges. Therefore, in estimates of available water supply, only the treated recycled water available and used to meet demand is listed as a source of supply, and not the entire capacity of the treatment plants.

San Jacinto Valley Regional Water Reclamation Facility

The San Jacinto Valley RWRF is currently under design for an expansion from secondary to tertiary treatment. This expansion will allow the recycled water from this plant to be used for more purposes than secondary treated water. The expansion to tertiary treatment will be completed in spring of 2008. In addition to the current expansion, this plant will be expanded again to increase capacity to meet new demands. Outlined in EMWD's Year 2025 Regional Water Reclamation Facilities Capital Improvement Plan (RWRF-CIP) the first expansion will take the plan from 11 MGD of capacity to 14 MGD. This expansion should be completed in 2011. The next expansion will take the plant to 18 MGD capacity and will begin in 2020 and be completed by 2024.

Moreno Valley RWRF

In April of 2005, planning began for the expansion of the Moreno Valley RWRF. This plant will be expanded from 13 MGD capacity to 21 MGD by 2009 according to the RWRF-CIP.

Temecula Valley RWRF

Located in one of the most rapidly growing areas of EMWD, the Temecula Valley RWRF just completed an expansion in 2005 and has two more scheduled before 2020. The expansion from 12 to18 MGD is in construction and is scheduled to be complete in June of 2006, and the expansion to 22 MGD will begin in 2010 and be completed in 2018.

Perris Valley RWRF Expansion

The Perris Valley Expansion to 22 MGD is in final design and will be completed in 2007. This expansion will double the capacity of the current treatment facilities. Another expansion to 30 MGD is scheduled to begin in 2013 and be completed by 2019.

Section 9 – Desalinated Water

As discussed previously, EMWD's Groundwater Desalination Program will construct three desalters, providing up to 12,000 AFY of low salinity potable water. The first two desalters are on line, and the third desalter is in the preliminary design stage.

The single greatest impediment to expanding EMWD's desalination plan is the high cost of brine disposal. As an inland agency, EMWD must purchase brine disposal capacity in a regional disposal system operated by the Santa Ana Watershed Project Authority (SAWPA). The costs of brine disposal are increasing extremely rapidly, threatening the economic viability of EMWD's program. Additionally, recent increased interest in desalination by other agencies in the region has led to a shortfall in available capacity that will limit EMWD's ability to expand its program in the future.

Because of the increased costs and limited availability of brine disposal capacity in SAWPA's regional system, EMWD has initiated several research projects to evaluate the feasibility of reducing brine volumes, including a research proposal with the U.S. Bureau of Reclamation to examine "zero-liquid discharge."

If EMWD can develop a strategy to minimize brine volumes and reduce the cost of brine disposal, expanded desalination of recycled water will become feasible. EMWD has developed groundwater management plans which call for up to 20,000 AFY of groundwater recharge using imported State Water Project water purchased from MWD. This imported water could be replaced (up to 10,000 AFY) by desalted recycled water, improving overall supply reliability and reducing EMWD's dependence upon imported water.

EMWD's preliminary research and feasibility studies into brine volume reduction will be completed late in 2007.

Table 9.1 - Opportunities for Desalinated Water

Source	Yield AFY	Start Date	Type of Use
Recycled Water	10,000	Unknown	Groundwater Recharge

Section 10 – Wholesale Water

Bringing Imported Water to EMWD

The Metropolitan Water District of Southern California (MWD) is a public agency organized in 1928 by a vote of electorates of thirteen Southern California cities. The agency was created by the original Metropolitan Water District Act (Metropolitan Act) by the California Legislature "for the purpose of developing, storing, and distributing water" to the residents of Southern California.

The first function of MWD was to build the Colorado Aqueduct bringing Colorado River water to Southern California. As MWD was constructing the San Jacinto Tunnel Portion of the project, a great amount of seepage was encountered. As the seepage began to affect local water resources, residents began to organize to protect their water supply. About the same time, the region experienced years of dry weather and the underground basin began to experience overdraft. It became clear that a source of imported water was necessary. EMWD was formed in 1950 to bring imported water into the area. In 1951, it was annexed into MWD and the first major sale of Colorado River water within EMWD, began in July of 1952.

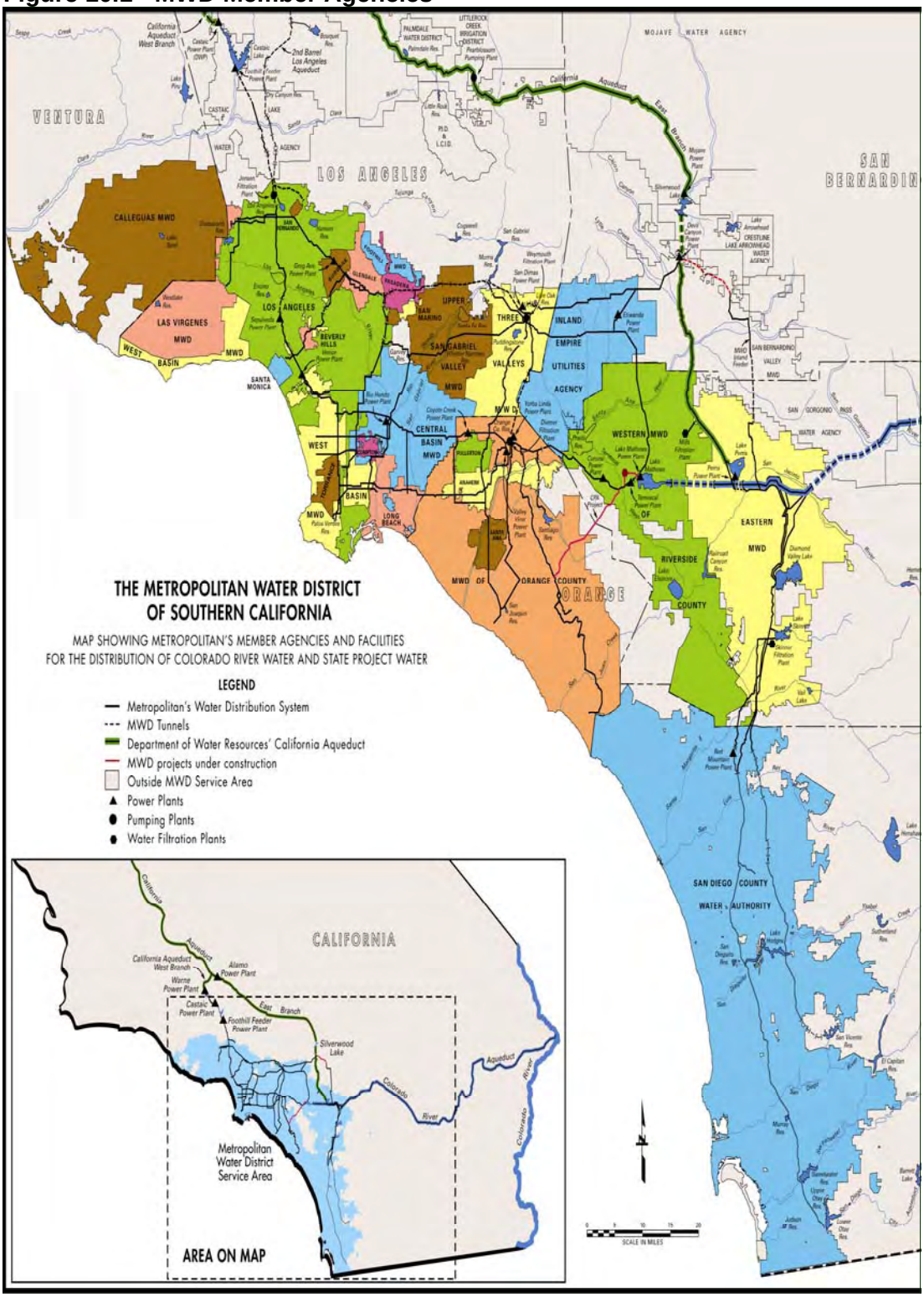
In 1960, MWD contracted for additional water supplies from the State Water Project (SWP) operated by the State of California Department of Water Resources (DWR). In 1972, the SWP began bringing water from the wet climate of northern California to the dry climate of southern California. Through the 1980's, EMWD built facilities to take advantage of the SWP water available, and today, 75% of EMWD's water supply is provided from Northern California.

Member Agencies

In addition to EMWD, MWD is composed of 25 other member agencies, including fourteen cities, ten other municipal water districts and one county water authority. MWD's service area includes the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the City of Oxnard in the north to the Mexican Border on the south, and it reaches more than 70 miles inland. The service area includes potions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Approximately 90% of the population within these counties is within MWD's boundaries. MWD member agencies serve more than 143 cities and 89 unincorporated areas. Figure 10.1 shows a map of MWD's service area.

Member agencies receive deliveries at different points in the system and pay for the service through a rate structure made up of multiple components. Each year member agencies advise MWD how much water they anticipate they will need during the next five years. MWD also works with member agencies to develop a forecast of future water demand.

Figure 10.1 - MWD Member Agencies



MWD is a wholesale provider only, and has no retail customers. It provides treated and untreated water directly to its member agencies. The 26 member agencies then deliver to their customers a blend of groundwater, surface water, desalinated water, recycled water and imported water from MWD. MWD has provided between 45% and 60% of the municipal and agricultural water used in its nearly 5,200-square mile service area. The remaining water is provided through local resources and imported water from other sources. More information about MWD is summarized in Section I.2 of the RUWMP.

Board of Directors

MWD's Board of Directors consists of thirty-seven directors. Each member agency is allotted at least one director with each agencies assessed value determining it's additional representation and voting rights. Currently, EMWD Board of Director's President, Randy Record, represents EMWD on MWD's Board.

Planning for the Future

MWD takes a comprehensive and proactive approach to planning for the future. Through coordination with member agencies, MWD has developed regional targets to accommodate growth and face the challenges to supply reliability. Through the past decade, MWD has undertaken several planning initiatives including the Integrated Resources Plan (IRP), the Water Surplus and Drought Management Plan (WSDMP), and the Strategic Plan and Rate Structure. Together these programs and plans provide a framework and guidelines for the future. Section II of the provides aditional information about MWD's planning efforts.

Integrated Resources Plan

In the 1990's, several years of drought and regulations requirements began to affect the reliability of MWD water supply. In response to this challenge, MWD and its member agencies began an Integrated Resource Plan (IRP) process level of supply reliability needed and to find a cost-effective way to meet the goals establish. The IRP was a collective effort drawing input from several groups including MWD's Board of Directors, an IRP workgroup (comprised of MWD staff, member agency and sub agency managers, as well as groundwater basin managers), and representatives from the environmental, agricultural, business and civic communities. It was important that the IRP process was collaborative because its viability was contingent on the success of local projects and local plans in achieving their individual target goals for resource management and development.

The outcome of the IRP process was a "Preferred Resource Mix" which would ensure MWD and its member agencies reliability through 2020. The MWD Board of Directors adopted the first IRP in January of 1996. In November of 2001, the MWD Board of Directors adopted a plan to update the IRP. The update focused on changed conditions, updated resource targets, and extending the planning horizon to 2025 and beyond. Again the process was a collaborative effort. The 2003 IRP Update was adopted in July of 2004

MWD's resource mix depends on a blend of improving the reliability and availability of imported water supplies into the region, increasing local storage and developing local resources. The 2003 IRP update demonstrated that MWD and its member agencies

have moved the region toward the goal of long-term water reliability. Major achievements have been made in:

- Conservation
- Water recycling and groundwater recovery
- Storage and groundwater management programs within the Southern California region
- Storage programs related to the SWP and the Colorado River
- Other water supply management programs outside of the region.

The 2003 IRP Update includes information about programs and resources developed or identified as part of the IRP process. Below is a table from the update summarizing each program and its status.

Table 10.1 – IRP Targets

Target	Programs and Status
• Conservation	Current – Conservation Credits – 1992 Plumbing Code – Southern California Heritage Landscape Program * In Development or Identified – Innovative Conservation Program – Innovative Supply Program
• Recycling • GW Recovery • Desalination	Current – LRP Program In Development or Identified – Additional LRP Requests or Proposal – Seawater Desalination Program
• SWP	Current – SWP Deliveries – San Luis Carryover Storage (Monterey Agreement) – Environmental Water Account In Development or Identified – Sacramento Valley Water Management Agreement – CALFED Delta Improvement Program
• CRA	Current – Base Apportionment – IID/MWD Conservation Program – Coachella and All American Canal Lining Program (to SDWCA & San Luis Rey) – Hayfield Storage Program** – PVID Land Management Program In Development or Identified – Lower Coachella Storage Program – Chuckwalla Storage Program – Central Arizona Banking Program – QSA Programs & Interim Surplus Guidelines
• In Region Dry-Year Storage	Current – Diamond Valley Lake, Lake Matthews, Lake Skinner – SWP Terminal Reservoirs (Monterey Agreement)
• In Region Groundwater Conjunctive Use	Current – North Las Posas – Cyclic Storage – Replenishment Deliveries

	– Proposition 13 Programs (short-listed) In Development or Identified – Raymond Basin GSP – Proposition 13 Programs (wait-listed) – Expanding existing programs – New groundwater storage programs
Target	Programs and Status
• CVP/SWP Storage and Transfers • Spot Transfers and Options	Current – Arvin Edison Program – Semi-tropic Program – San Bernardino Valley MWD Program – Kern Delta Program – Desert Water/Coachella Valley Advanced Storage – Spot Market transfers and options – Mojave Storage Demonstration Program (pilot) In Development or Identified – San Bernardino Valley MWD Conjunctive Use Program – Kern Water Banking Program – Other San Joaquin Valley Programs

* Program savings not currently quantified

** Program has been implemented with approximately 72,000 AF in storage and extraction facilities are under construction.

Through the development and expansion of these programs, MWD has been able to insure reliable water deliveries through 2025. The 2003 IRP Update is available through MWD or on its website.

Water Surplus and Drought Management Plan

In order to insure that water needs will be met during years of drought, surplus water must be managed during years of surplus. To accomplish this task, MWD developed the Water Surplus and Drought Management Plan (WSDM). Adopted in April of 1999, this plan provides policy guidance for management of regional water to achieve the reliability goal of the IRP. The guiding principle of the WSDM plan is to "Manage Metropolitan's water resources and management programs to maximize adverse impacts of water shortage to retail customers." Should mandatory import water allocations be necessary, those allocations would be calculated based on need, as opposed to any type of historical purchases.

MWD has several stages from surplus to shortage and a planned response for each stage. The following section discusses the management activities to be taken, depending on the level of available supplies, starting with a large amount of surplus to extreme shortage. Under MWD's current IRP, the measures listed for extreme shortage should not have to be implemented for the next 20 years.

Surplus Stages

Surplus Stage 5 - MWD makes deliveries to all available in-region and out of region storage resources.

Surplus Stage 4 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs.

Surplus Stage 3 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; and deliveries to Semi tropic and Arvin-Edison groundwater storage programs.

Surplus Stage 2 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; deliveries to Semi tropic and Arvin-Edison groundwater storage programs and deliveries of SWP carryover water to SWP reservoirs.

Surplus Stage 1 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; deliveries to Semi tropic and Arvin-Edison groundwater storage programs; deliveries of SWP carryover water to SWP reservoirs and contractual groundwater storage deliveries.

Shortage Stages

Shortage Stage 1 - MWD may make withdraws from Diamond Valley Lake.

Shortage Stage 2 - MWD will continue Shortage Stage 1 action and may draw from out-of-region groundwater storage.

Shortage Stage 3 - MWD will continue Shortage Stage 2 actions and may curtail or temporarily suspend deliveries to Long-term Seasonal and Replenishment programs in accordance with discount rates.

Shortage Stage 4 - MWD will continue Shortage Stage 3 actions and may draw from conjunctive use groundwater storage and the SWP terminal reservoirs.

Severe Shortage Stages

Shortage Stage 5 – MWD will continue Shortage Stage 4 actions. MWD's Board of Directors may call for extraordinary conservation, may curtail Interim Agricultural Water Program Deliveries.

Shortage Stage 6 - MWD will continue Shortage Stage 5 actions and may exercise any and all water supply option contracts and/or buy water on the open market for consumptive use or for delivery to regional storage facilities for use.

Section II.4 of the RUWMP has additional information about the WSDM Plan.

EMWD Demand

MWD does not provide supply projections for each member agency. Instead MWD uses a regional approach to developing projections. MWD calculates the demand for the entire region as discussed in Appendix A.1 of the RUWMP and then using information about existing and proposed local projects, determines the amount of imported water. Through out 2005, EMWD has provided to MWD information about local supply and projects, clarification on boundary information and population projects. Based on this information and information provided by other member agencies, MWD feels it is able to meet the demands of all member agencies through 2030. Table 10.2 shows the projected water information provided to MWD by EMWD in August of 2005. The demand

estimated for MWD is slightly higher than the final projections shown in Sections 2 and 6. The final projections were refined after this earlier estimation.

Table 10.2 EMWD Imported Water Demand -AFY

	2005	2010	2015	2020	2025	2030
Water for Direct Consumption (Raw and Potable)	86,630	91,300	106,500	123,900	137,000	147,500
Replenishment Water	8,000	20,000	22,200	22,600	22,600	22,500

Section 11 – Water Shortage Contingency Plan

The mission of EMWD is to provide safe and reliable water and wastewater management services to its community in an economical, efficient, and responsible manner now and in the future. Part of accomplishing that mission is to plan for the unplanned. EMWD has two tools that assist in that planning 1) the Water Shortage Contingency Plan (WSCP), included in Appendix D, and 2) the Water System Emergency Operation Procedures (WSEOP). The WSCP will guide EMWD in advising and enforcing conservation during times of water shortage, while the WSEOP is an operational guide created to avert water shortages in the EMWD service area during emergency conditions.

Stages of Action

The WSCP for EMWD was adopted in July of 2005. This plan limits water demand during times of shortage in four stages. These stages can be triggered when there is water deficiency caused by limitations on supply or limitations on EMWD's delivery system. The plan shall be implemented in case of a long or short-term water deficiency, or in case of an emergency water shortage. The stages are summarized in the table below:

Table 11.1 -Water Shortage Contingency Plan Stages of Action

Stage No.	Water Supply Conditions	% Shortage
1	Anticipated or existing water demand exceeds available supply due to any of the following: – Shortfall at MWD's water treatment plants (Skinner or Mills) – Reduction in availability of MWD's raw water supply – Shortfall at EMWD microfiltration plants or desalination plants – Reduction in availability of water from EMWD wells. – Limitations on delivery system	5-10
2		10–20
3		25-50
4		>50

When implementation of the plan is triggered by anticipated limitations in supply or delivery, the Board of Directors, at the request of the General Manager, has the ability to implement appropriate water shortage contingency measures to limit the impact on EMWD customers as much as possible. When a water shortage emergency occurs, the General Manager has the authority to implement the plan if necessary.

Estimate of Minimum Supply

Metropolitan Water District of Southern California (MWD) has multiple sources of water supply. Most of them are imported, some of them are local and some of them are both (imported water treated locally). As EMWD's mission is to provide safe and reliable water, EMWD strives to ensure that customer demand can be met in all circumstances. Even under the driest three-year cycle, EMWD supply is anticipated to meet demand. With the groundwater management plans in place, the West San Jacinto area has rising water levels and wells are not anticipated to decrease production, and the Hemet/San Jacinto area will be recharged in years of surplus to prepare or recover from dry years. Since local water supplies are stable and fixed, the small increase in demand during dry years will be met through imported water form MWD. Under the Integrated Resources Plan (IRP) and Water Surplus and Drought Management Plan (WSDM) water, imported

by MWD, will be available to meet 100% of member agencies' demands even during dry periods. Therefore, as seen in the table below, the available supply will be determined by the amount of water required to meet demands. In the event the next three years are not dry, surplus water supplies will be stored for future use under the guidelines the WSDM plan provides.

Table 11.2 - Three- Year Estimated Dry Year Supply AFY
(1990-1992 Hydrology)

	2006	2007	2008
Current Supplies			
Local Water Sources			
Groundwater-Hemet/San Jacinto Basin Native Groundwater	11,040	10,080	9,120
Groundwater – West San Jacinto	6,000	6,000	6,000
Groundwater Desalter – Menifee	2,000	3,000	3,000
Groundwater Desalter – Perris	2,000	4,500	4,500
Recycled Water – M&I Use	4,383	5,232	6,080
Recycled Water – Agricultural Use	22,814	21,978	21,142
Imported Water Sources			
Perris FP	8,800	8,800	8,800
Mills and Skinner	75,033	73,938	69,043
MWD Untreated AG	2,504	2,208	1,912
Supplies Under Development			
Local Water Sources			
Groundwater Desalter – Perris II	0	0	0
Recycled Water – Industrial Enterprise and Aesthetic Improvement	1,414	2,828	4,242
Hemet/San Jacinto Watermaster	2,800	3,500	4,200
Imported Water Sources			
Hemet FP – MWD Raw Water Treated by EMWD			4,400
Perris FP Expansion – MWD Raw Water Treated by EMWD			2,900
Recharge Water into the San Jacinto Basin	8,496	11,372	14,248
Total	147,284	153,436	159,587
% of Normal	100%	100%	101%

Catastrophic Supply Interruption

EMWD is dependent on MWD for the majority of its supply. As described in section 11.5 of the RUWMP, MWD has prepared for emergencies through storage, facility design and redundant power sources. Half of the capacity of Diamond Valley Lake, located within EMWD's service area, is reserved for emergency supply. Diamond Valley Lake Reservoir is designed to gravity feed in the case of an electrical failure. In addition to Diamond Valley Lake, MWD has other storage programs that are detailed in Appendix A.3-3 of the RUWMP. For treatment plants MWD has back up generators in place in case of electrical outage.

To protect EMWD customers in the case of an emergency, EMWD has developed the Water Shortage Emergency Operations Plan (WSEOP). This plan determines the operation response to any emergency. An emergency is defined as any time MWD or EMWD facilities are incapable of supplying potable water. An emergency could be caused by a natural disaster such as an earthquake or through facility failures. The operational describes the coordination required between operational staff, management, community involvement staff and other EMWD employees. In addition communication and cooperation will be required with the community and other agency such as the Department of Health Services and MWD. In the event that one or more water supply

source is unavailable, remaining sources of supply will be maximized to meet demand. If needed the WSCP could be implemented to conserve water and reduce demand. If an electrical or gas power outage occurs, some of EMWD's booster facilities have back up generators. Facilities without redundant power sources may be served on a priority basis by portable generator.

Prohibition, Penalties and Consumption Reduction Methods

In order to reduce demand by EMWD customers in the case of deficiency in water supply, EMWD has developed several prohibitions and consumptive reduction methods. These methods are targeting outdoor water use, and under the most extreme deficiencies would reduce demand more than 50%.

The WSCP prohibitions and reduction methods are organized by customer groups with different limitations on each group. Stage 1 starts with voluntary measures. In the past, voluntary conservation that is the result of intense public relations costs has led to a 10% reduction in demand. As the water deficiency increases, measures become mandatory and will lead to the needed reduction in water demand. The tables below list limitations placed on customers in the event the WSCP is implemented.

Table 11.3 - Prohibitions

Prohibitions	Stage When Prohibition is Implemented
Do not hose down driveways or any other hard surfaces except for health or sanitary reasons. Use a broom or blower instead.	Voluntary Stage 1 Mandatory Stage 2
Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve.	Voluntary Stage 1 Mandatory Stage 2
No replacement water will be provided for ponds, lakes, etc.	Mandatory Stage 2
Washing of autos, trucks, trailers, motor homes, boats, airplanes or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables.	Mandatory Stage 3
No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.	Mandatory Stage 4
No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.	Mandatory Stage 4
No new lawns/turf, whether by seed or sod, shall be permitted.	Mandatory Stage 4
No person or entity shall be required to implement any new landscaping requirements of any association, developer or governing agency until the termination of Stage 4.	Mandatory Stage 4
Based on interruptible agriculture water from MWD, field and row crops may be discontinued.	Mandatory Stage 4

Table 11.4 - Consumption Reduction Methods

Consumption Reduction Method	Projected Reduction	Stage When Consumption Reduction Method is Implemented
Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering).	5% of external use	Voluntary Stage 1 Mandatory Stage 2
Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.	10% of external use	Voluntary Stage 1 Mandatory Stage 2
Where possible, install pool and spa covers to minimize water loss due to evaporation.	90% of water loss in pools	Voluntary Stage 1 Mandatory Stage 2
Refrain from using decorative fountains unless they are equipped with a recycling system.		Voluntary Stage 1 Mandatory Stage 2
Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.	Varies	Mandatory Stage 3
The use of water from fire hydrants shall be limited to fire fighting and related activities.	Varies	Mandatory Stage 3
Water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.	Varies	Mandatory Stage 3
Outdoor irrigation by sprinklers will only be allowed every other day.	50% of external use	Mandatory Stage 3
Irrigation of landscaping is only allowed twice per week with hand-held hose only.	72% of external use	Mandatory Stage 4
All new landscaping shall be limited to drought-tolerant plantings as determined by the District.	30% of eternal use for all new homes	Mandatory Stage 4
Use of water by all types of commercial car washes shall be reduced in volume by 50%.	50%	Mandatory Stage 4
Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100% of ET) to 0.8 (80% of ET).	20%	Voluntary Stage 1 Mandatory Stage 2
Landscape meters to 75% of ET	25%	Mandatory Stage 3
Landscape meters to 60% of ET	40%	Mandatory Stage 4

The WSCP gives EMWD the right to impose penalties for the unreasonable use or waste of water while the plan is in effect. It also allows EMWD to impose fines for individual events violating the plan, or to impose a tiered rate system that will provide for charges and/or penalties for higher consumption of water over and above the requirements for Stages 1 through 4 of the plan. The event based penalties and charges are detailed in Table 11.5.

All of EMWD's customers are metered with meters usually read once a month. If the WSCP is implemented, EMWD could monitor water use for comparison with historical data to determine water savings. EMWD could also use meter readers to report violation of the WSCP or excessive water use.

Table 11.5 - Penalties and Charges

Penalty and Charges	Stage When Penalty Takes Effect
For the first monthly violation of the provisions of the water shortage contingency plan, the District shall issue a written notice of fact of such violation to the customer.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
For the second and third month violations, a surcharge of 100% of current charges.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
For the fourth and succeeding month(s) violation, a surcharge of 200% of current water bill commodity charge shall be added to the customer's water bill.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
Thereafter, the District may install a flow restricting device of one gallon per minute (1 GPM) capacity for services up to 1 ½" size and comparatively sized restrictors for larger services.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
The District may also terminate a customer's irrigation/landscape meter service.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.

Analysis of Revenue

As a result of a water shortage or emergency situation, there may be a reduction of revenue from water sales. To protect EMWD from financial hardship in such a situation, a financial reserve account has been established to meet the fixed cost associated with water delivery that may not be met in the case of reduced water sales. In the tables below, the revenue impacts of implementing the WSCP are analyzed.

Table 11.6 - Actions and Conditions that Impact Revenue

Type	Anticipated Revenue Reduction
Reduced Water Sales	Water sales are approximately 40% of EMWD's annual revenue. A reduction in the demand of water by 50% would also mean a reduction in revenue from water sales of 50% leaving a shortfall of approximately 20% of EMWD annual revenue.

Table 11.7 - Actions and Conditions that Impact Expenditures

Category	Anticipated Cost
Increased Staff Cost	Staff costs for implementing the WSCP could vary depending on the stage trigger by a deficiency in water supply. Stage 1 and 2 would probably be implemented with only current staff members. Stage 3 or 4 of the plan may require additional staff to implement. The amount and level of staff will vary greatly depending on the public's response to the plan.
O & M Cost	Operations and maintenance cost may be minimally impacted by the implementation of the WSCP, but these costs are projected to have minimal impact on EMWD's total revenue.
Cost of Supply and Treatment	Cost of supply would decrease due to a decrease in demand and would offset some of the costs associated with reduced water sales.
Public Outreach Costs	Costs associated with informing the public about implementing the WSCP will vary based on the public's response and the stage of the plan implemented.

Table 11.8 - Proposed Measures to Overcome Revenue Impacts and Increased Expenditures

Name of Measure	Summary of Effect
Rate Adjustment	Part of the WSCP is the ability to implement a tiered rate. This may offset some of the lost revenue due to a decrease in water sales.
Reserve Policy	EMWD, as a matter of policy, keeps a reserve of funds equivalent to 90 days of operational expenses. This reserve fund could be used to mitigate revenue shortfalls.
Rate Stabilization Fund	EMWD also has a rate stabilization fund with approximately $7 million available to offset increased costs and decreased sales.

Section 12 - Water Recycling

Planning Coordination

As a full-spectrum provider of water, wastewater collection, and treatment and recycled water services, EMWD has been active in developing local and regional plans for expanded water recycling in its service area. EMWD's first Recycled Water Facilities Master Plan was developed in 1990 and formally updated in 1997. EMWD's local water recycling plan is also incorporated into the Integrated Regional Water Management Plan developed by the Santa Ana Watershed Planning Authority for the San Jacinto and Santa Ana Watersheds.

The District has worked closely with the Santa Ana Regional Water Quality Control Board in updating local basin plans and developing a long-term salinity management plan to support and ensure compliance with local basin objectives for salinity and nitrogen. EMWD is also participating in the development of a Total Maximum Daily Load (TMDL) analysis for impacted surface waters in the Santa Ana Watershed.

EMWD has been involved with a variety of local agencies and public interest groups in recycled water planning efforts:

Table 12.1 – Participating Agencies

Group/Agency	Role
1) Santa Ana Watershed Planning Authority	Regional Cooperative Planning
2) Santa Ana Regional Water Quality Control Board	Basin Planning/Salinity Mgmt
3) Rancho California Water District	Facility Planning/Market Dev.
4) West San Jacinto Groundwater Management Plan Advisory Board	Plan Review/Public Oversight
5) Hemet/San Jacinto Groundwater Management Plan Policy Committee (Cities of Hemet, and San Jacinto and Lake Hemet Municipal Water District)	Plan Review/Public Oversight
6) Elsinore Valley Municipal Water District	Facility Planning/Market Dev.
7) EMWD Recycled Water Adv. Comm.	Plan Review/public Oversight
8) San Jacinto Watershed Council	Plan Review/Public Oversight
9) Lake Elsinore/San Jacinto Watershed Authority	Plan Review/Water Quality
10) Metropolitan Water District of Southern California	Regional Urban Water Mgmt. Planning

Wastewater Quantity, Quality and Current Uses

The District is responsible for all wastewater collection and treatment in its service area. Wastewater collection and treatment facilities include:

- 1,534 miles of gravity sewer
- 53 sewage lift stations
- 5 regional water reclamation facilities (RWRF)

Inter-connections between the local collections systems serving each treatment plant allow for operational flexibility, improved reliability, and expanded deliveries of recycled water.

Table 12.2 - EMWD Treatment Facilities – AFY

Treatment Plant	Level of Treatment	Capacity	*2000* Flow	*Current* Flow
San Jacinto Val. RWRF	Secondary	12,300	7,800	9,400
Moreno Valley RWRF	Tertiary	17,900	12,200	14,200
Perris Valley RWRF	Tertiary	12,300	8,600	12,200
Sun City RWRF	Tertiary	3,400	Not in Service	Not in Service
Temecula Valley RWRF	Tertiary	15,700	8,500	14,200
Total System		61,600	37,100	50,000

With the exception of the San Jacinto Valley RWRF, all of EMWD's RWRF's produce tertiary effluent, suitable for all Department of Health Services permitted uses, including irrigation of food crops and full-body contact. The secondary effluent produced by the San Jacinto Valley RWRF is used locally for the irrigation of fodder, feed, and seed crops. However, tertiary treatment capacity will be added to the plant in 2006.

EMWD's recycled water delivery system includes:

- 135 miles of large diameter transmission pipeline,
- 6,000 AF of surface storage reservoirs (10 separate sites),
- 4 regional pumping plants.

EMWD currently has 91 recycled water customers and sells up to 26,000 AFY of recycled water. The majority of recycled water sold is used for agricultural irrigation. However, sales to municipal customers are increasing rapidly as residential and urban development replaces irrigated farmland. EMWD also sells recycled water to the California Department of Fish and Game for habitat creation and environmental enhancement at the San Jacinto Wildlife Area.

EMWD is able to sell 90% - 100% of the recycled water produced by its treatment plants during the peak demand months (June – September). During the cooler, wetter parts of the year, surplus recycled water is stored in unlined surface impoundments, resulting in extensive groundwater recharge. If storage capacity is full, surplus recycled water is disposed through a regional outfall pipeline to Temescal Creek and the Santa Ana River.

Table 12.3 - Wastewater Collected and Treated – AFY

	2000	2005	2010	2015	2020	2025
Wastewater Collected & Treated	36,572	49,976	61,051	69,817	78,177	85,785
Quantity Meeting Recycling Standards	36,572	49,976	61,051	69,817	78,177	85,785

Table 12.4 - Disposal of Wastewater (Non-Recycled) – AFY

Name of Disposal	Treatment	2000	2005	2010	2015	2000	2025
Livestream Discharge	Tertiary	0	9,976	13,651	18,117	22,977	26,785

Table 12.5 - Recycled Water Uses – Projected AFY

Type of Use	Treatment Level	2005 AFY
Agriculture	Secondary/Tertiary	17,037
Landscape	Tertiary	3,500
Wildlife Habitat	Secondary/Tertiary	2,000
Wetlands/Lake	Tertiary	2,463
Industrial	Tertiary	0
Groundwater Recharge *	Secondary/Tertiary	15,000
Total		40,000

* Note – From a regulatory viewpoint, this recharge is permitted as being incidental to storage.

Potential and Projected Use, Optimization Plan with Incentives

As mentioned previously, EMWD's extensive water recycling distribution system will maintain the current high level of operation as agricultural customers are replaced by municipal customers. EMWD is planning additional pipelines that will expand municipal use of recycled water over time and is planning several innovative projects to provide recycled water to long-term agricultural customers (citrus orchards) in-lieu of over drafted groundwater. The District will maintain current levels of groundwater recharge to sustain project yields for the Perris Basin Desalination Program, and will work with the California Department of Fish and Game to expand the use of recycled water at the San Jacinto Wildlife Area.

Table 12.6 - Recycled Water Use Potential - AFY

Type of Use	Treatment Level	2010	2015	2020	2025
Agriculture	Tertiary	13,400	13,200	13,200	13,200
Landscape	Tertiary	7,700	10,950	13,200	15,750
Wildlife Habitat	Tertiary	4,300	4,300	4,300	4,300
Wetlands/Lakes/Supply Augmentation	Tertiary	2,000	3,250	4,500	5,750
Industrial	Tertiary	5,000	5,000	5000	5,000
Groundwater Recharge	Tertiary	15,000	15,000	15,000	15,000
Total		47,400	51,700	55,200	59,000

EMWD is committed to maximizing recycled water uses wherever possible. Within the framework of known and potential projects, Table 12.7 lists potential recycled water use also includes projections for future recycled water use.

EMWD's year 2000 projection for recycled water use in 2005 was based upon the following assumptions:

- Continued strong agricultural sales
- Rapid expansion of municipal markets
- Stable habitat sales
- Expanded sales to Elsinore Valley Municipal Water District

A comparison of projected reclaimed water use versus actual sales for 2005 shows that the projections were fairly accurate.

Table 12.7 - Recycled Water Use – 2000 Projection Compared to 2005 Actual-AFY

Type of Use	2000 Projections for 2005	2005 Actual Use
Agriculture	19,495	17,037
Landscape	10,680	3,500
Wildlife Habitat	2,213	2,180
Wetlands/Lake Supply Augmentation	2,000	2,463
Industrial	0	0
Groundwater Recharge	8,726	15,118
Total	43,114	40,298

Due to land use changes and wet winter conditions, 2005 agricultural sales were lower than projected. Municipal sales were lower than projected due to operational issues, which limited the connection of new customers in portions of EMWD's service area. These problems have been corrected and growth in municipal sales should increase sharply over the next five years.

Methods to Encourage Recycled Water Use

EMWD uses a variety of methods to expand the use of recycled water within its service area. These methods include:

Mandatory Recycled Water Use Ordinance – The District has adopted an ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available. This ordinance provides a basis for denying potable water service to customers refusing to utilize available recycled water for permitted uses.

Rate Incentives – Tertiary recycled water is currently priced at approximately one third of the cost of potable water for municipal use and at one quarter of the cost of potable agricultural deliveries for crop-irrigation.

Water Supply Assessments – EMWD's SB 610 and 221 Water Supply Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted.

Public Education – EMWD actively promotes the public use of recycled water in several elements of its water education program. EMWD also places prominent signage at public recycled water use sites promoting the benefits of water recycling.

Market Surveys – EMWD periodically hires market firms to survey businesses in its service area in order to identify potential recycled water customers.

Facilities Financing – EMWD will work with private parties to arrange or provide financing for construction of facilities needed to convert existing customers from potable water to recycled water.

EMWD does not have any data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for agricultural customers to use recycled water in-lieu of groundwater. However, as municipal customers continue to replace agriculture, it is reasonable to assume that the mandatory provisions of the District's Recycled Water Use Ordinance will play a major role in program expansion.

Section 13 - Water Quality Reliability

Water quality is large part of EMWD's strategic goal to "Provide a safe and reliable supply of water at a reasonable cost." Planning and monitoring for water quality are important for protecting public health, controlling costs and insuring reliability for the future. EMWD has identified eleven contaminants that do not currently meet public health guidelines and several other concerns that may limit EMWD supplies in the future. Tables 13.1 and 13.2 list these areas of concern and give information about each one.

In addition to EMWD's concerns, MWD has identified several areas of regional concern in the 2005 MWD Regional Urban Water Management Plan. Although MWD anticipates no significant reduction in water supply reliability for the next 20 years, water quality affecting local water supplies may increase demand on MWD's water supply beyond what had been projected.

Public Heath Goals

A Public Health Goal (PHG) is the level of a contaminant in drinking water, which there is no known or expected risk to health. The California Office of Environmental Health Hazard Assessment (OEHHA) based these goals on the best available toxicological data in the scientific literature. These are goals and not regulations.

The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs as is economically and technologically feasible. If MCLs are lowered for the eleven contaminants listed in Table 13.1, further treatment or blending may be required. If the MCL cannot be met using blending or treatment, a portion of EMWD's water supply may be unavailable.

Other Concerns

Table 13.2-3.4 lists future regulations that may affect EMWD's water supply and the risk it may pose to EMWD's water supply reliability. These are regulations that will be in place or may be in place in the future.

MWD Water Quality

As part of the Integrated Resource Plan, MWD has concentrated on maintaining the quality of source water and developing management programs that protect and enhance water quality. MWD has two water supply sources and each one has water quality issues. To date, MWD has not identified any water quality issues that cannot be mitigated. Salinity may decrease the amount of water available if membrane treatment is required. MWD could experience a loss of up to 15 percent of the water processed. Since only a small portion of the total water supply would be treated and blended with the remaining unprocessed water, there is no significant risk to MWD's water supply availability. Additional information and analysis of water quality is included in Section IV of the RUWMP.

Table 13.1 – EMWD Present PHG Violations

Contaminant	Bromate	Chromium	Coliform	Copper
Year(s)	2003	1998-2000	2001-2003	2002-2003
Units	Ug/L	ug/L	monthly percent	ug/L
PHG (MCLG)	(0)	2.5	(0)	170
MCL	10	50	5	AL = 1300
Source	Mills	Well 44 Well 56 Well 57	Distribution system samples	Distribution system samples
% of Potable Water Supply in 2005	54.0%	0.7% 0.1% 1.1%	Unknown	Unknown
Range	4.5 - 10.4	1.1-10	0 - 2.1	90th % = 230
Range Category of risk to public health	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)	Unknown: coliforms are not harmful in of themselves, but an indicator of poor water quality	Acute Toxicity (Gastrointestinal effects in children, Human data)
Cancer Risk @ PHG or MCLG	0	1×10^{-6}	NA	NA
Best Available Treatment	Optimize Ozone treatment	Reverse Osmosis	Optimize chlorine residuals, programs for flushing, cross connections, monitoring,	Optimize Corrosion Control
Cost estimate per 1000 gallons (in dollars)*	NA		NA	0.008
Action taken by EMWD	EMWD supports MWD to optimize the Ozone treatment at the Mills Plant.	These wells blend in the distribution system, and no chromium has been detected downstream.	EMWD has programs for flushing, cross connection, extensive monitoring for coliform, chlorine residuals and HPCs. EMWD also works toward the optimal use of chlorine to reduce the formation of disinfection by products.	East Valley has 48% of Cu problem, EMWD is looking into altering addition of polyphosphates for Fe and Mn sequestration to enhance corrosion control.

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Dibro-mochloro-propane (DBCP)	Lead	Nickel			Nitrate
Year(s)	2001-2002	2002-2003	2003			2001-2003
Units	ng/L (ppt)	Ug/L	ug/L			mg/L
PHG (MCLG)	1.7	2	12			10
MCL	200	AL = 15	100			10
Source	Well 44	Distribution system samples	Well 11	Well 34	Well 56	Well 44**
			Well 28	Well 35	Well 76	Well 49**
			Well 33	Well 55		

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Dibro-mochloro-propane (DBCP)	Lead	Nickel			Nitrate
Percent of Potable Water Supply in 2005	0.7%	Unknown	0.0%	0.4%	0.8%	0.7%
			1.0%	1.6%	1.7%	0.3%
			0.9%	0.7%		
Range	ND - 70	90th percentile = 7	48	38	62	12.9 - 16
			11-14	20	16 - 88	21 - 24
			40	53		
Range Category of risk to public health	Carcinogenicity (Cancer)	Chronic Toxicity (Neurobehavioral effects in children, Hypertension in adults) and Carcinogenicity (Cancer)	Developmental Toxicity (Increased Neonatal Deaths)			Acute Toxicity (Methemoglobinemia)
Cancer Risk @ PHG or MCLG	1×10^{-6}	NA	NA			NA
Best Available Treatment	Granular Activated Carbon	Optimize Corrosion Control	Ion Exchange, Lime softening, Reverse Osmosis			Blending, Ion Exchange, Reverse Osmosis, Electrodialysis
Cost estimate per 1000 gallons (in dollars)*	0.43	Unknown	0.43 - 0.56			0
Action taken by EMWD	EMWD blends at this well to reduce nitrates, therefore the actual numbers at POE are less, although not less than the PHG. No further action has been taken.	Continue to investigate corrosion control in system.	None			EMWD blends at these wells to reduce nitrates to less than MCL

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)	Uranium
Year(s)	2001-2003	2001-2003	2001-2003
Units	ug/L	ug/L	pCi/L
PHG (MCLG)	0.06	0.8	0.5
MCL	5	5	20
Source	Well 44 Well 49	Well 56	Skinner San Jacinto West Portal Well 75
Percent of Potable Water Supply in 2005	0.7% 0.3%	0.8%	17.4% 0.2%
Range	1.4 - 1.5 2.5 - 2.7	0.5 - 1.9	ND – 3.18 ND - 3.92 8.96

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)	Uranium
Range Category of risk to public health	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)
Cancer Risk @ PHG or MCLG	1×10^{-6}	1×10^{-6}	1×10^{-6}
Best Available Treatment	Granular Activated Carbon, Packed Tower Aeration	Granular Activated Carbon, Packed Tower Aeration	Ion Exchange, Enhanced coagulation/ filtration, Lime softening, RO
Cost estimate per 1000 gallons (in dollars)*	0.43	0.43	0.43 - 0.56
Action taken by EMWD	EMWD blends at these wells to reduce nitrates, therefore the actual numbers at POE are less. No further action has been taken.	None	Skinner plant uses enhanced coagulation/filtration, Well 75 feeds the Menifee Desalter using RO. Water from the San Jacinto Portal is treated at the Perris WFP by ultrafiltration.

Table 13.2 – EMWD Potential PHG & MCL Violations

Constituent	Arsenic	Groundwater Rule
Year(s) sampled	2004	
Units	ug/L	
PHG (MCLG)	NA	
MCL	10	
Source	Well 17	all EMWD wells are absent for E. coli
Percent of Potable Water Supply in 2005	0.7%	17.4%
Range	5-10	
Risk to public health	Cancer risk	
Status of Constituent or Rule	Arsenic Rule is promulgated and will start in June, 2005	Groundwater Rule due by end of 2005: fecal contamination
Risk to EMWD water supply	May lose this source if arsenic rises to >10 ug/L unless EMWD treats at the wellhead.	Low level of risk, if contamination is found, EMWD will have to prove 4 log virus inactivation.

Table 13.3 – EMWD Potential PHG & MCL Violations, UCMR

Constituent	Perchlorate	Radon	1,2,3-TCP, Trichloro-propane	Chromium VI	CCL microbes
Year(s) sampled	2004	2002-03 2002 2002 2002 2003	2003	2003	Adenovirus, Aeromonas hydrophila, Calciviridae, Coxsackievirus, Cyannobacteria, Echovirus, Helicobacter pylori, Microsporidia, Mycobacterium avium Complex
Units	ug/L	pCi/L	ug/L	ug/L	
PHG (MCLG)	6	>300 proposed	NL= 0.005 ug/L		
MCL	NA		NA		
Source	Well 44 Well 49 Well 57	Well 44 Well 49 Well 56 Well 57 Well 76	Well 23	Well 35	Unknown levels in wells
Percent of Potable Water Supply in 2005	0.7% 0.3% 1.4%	0.7% 0.3% 0.8% 1.4% 1.7%	0.0%	1.6%	17.4%
Range	ND-5 9.6-11 ND	1250-1440 606 778-914 918-1090 361	0.053	1.5	
Risk to public health	Possible endocrine disruptor	cancer risk	cancer risk	Cancer risk	Gastrointestinal disease, meningitis, Hand, foot and mouth disease, conjunctivitis, unspecified febrile illness, dermatitis, hepatitis, respiratory illness, peptic ulcer, gastric cancer, wasting syndrome
Status of Constituent or Rule	PHG promulgated in 2004, MCL is pending	Radon Rule is pending	No action at this time, future regulation possible	No action at this time, future regulation possible, needs a PHG to determine MCL which was due in 2004	No action at this time, future regulation possible
Risk to EMWD water supply	Low risk, since these three wells are already treated for nitrates by blending	Rule is pending, no PHG or MCL has been established	Well 23 is off line due to other water quality and operational problems	Level of 1.5 ug/L is very low, probably not going to be regulated at this level.	Unknown

Table 13.4 – EMWD Potential PHG & MCL Violations, Contaminant Candidate List (CCL) Chemicals

Constituent	Fluoride	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)
Year(s) sampled	2004	2004	2004
Units	mg/L	ug/L	ug/L
PHG (MCLG)	2	0.06	0.8
MCL	1	5	5
Source	All EMWD wells and surface waters are <= 0.7 mg/L	Well 44 Well 49	Well 56
Percent of Potable Water Supply in 2005		0.8% 0.3%	0.8%
Range		1.2-2 3.6-7.9	1.5-1.7
Risk to public health	fluoridosis	cancer risk	cancer risk
Status of Constituent or Rule	On CCL, EPA will request NAS to update the Risk Assessment	On CCL, EPA has requested NAS to update the Risk Assessment	On CCL, EPA has requested NAS to update the Risk Assessment
Risk to EMWD water supply	Probably a low risk, since all of our waters are below the recommended level of fluoride to prevent dental caries.	These wells are already blended to treat nitrate, however the blended waters are still above the PHG. EPA will continue to reassess this chemical until the PHG equals the MCL. If this happens, treatment will be required.	EPA will continue to reassess this chemical until the PHG equals the MCL. If this happens, treatment will be required.

Colorado River

The most serious threat to the Colorado River supplies is salinity levels. Colorado River supplies must be blended with State Water Project (SWP) water to meet the adopted salinity standards. MWD is working to reduce current salinity level and protect salinity levels from rising in the Colorado River. In addition, MWD is also working to protect the Colorado River from uranium, perchlorate and hexavalent chromium. MWD fully expects its source protection efforts to be successful. Therefore, the only water quality constraint on the use of Colorado River Water is salinity levels.

State Water Project

The water quality issues on the SWP include total organic carbon, bromides and salinity. MWD is working to protect the water quality of this source, but has also seen the need for upgraded treatment to deal adequately with water quality concerns. Total organic carbon and bromide levels are producing disinfection byproducts that current water treatment plants may be inadequate to deal with. MWD expects this treatment limitation to be overcome over the next few years by implementing ozone as the primary

disinfectant, and does not expect water quality to limit SWP supplies over the RUWMP study period.

Regional Water Quality

New standards for contaminants may add cost to the use of groundwater storage and may affect reliability of local agency groundwater sources. These standards are not expected to effect MWD's water supply, but may increase dependence on MWD. MWD has not analyzed the effect local water quality issues may have on total supply reliability.

The major water quality concerns MWD has identified for the region are:

- Salinity
- Perchlorate
- Total Organic Carbon and Bromide
- Methyl Teriary Butyl Ether (MTBE) and Tertiary Butanol (TBA) in groundwater and local surface reservoirs
- Arsenic
- Radon
- Uranium
- N-nitrsodimethylamine (NDMA) in groundwater and treated surface waters
- Hexavalent chromium in groundwater
- Pharmaceuticals and personal care products

Salinity

High salinity can reduce operational flexibility and increase the cost of water. Membrane treatment can result in water losses of up to 15 percent of the treated water. High total dissolved solids (TDS) in water also leads to high TDS in wastewater and therefore, recycled water, limiting the use of recycled water. Imported water with high salinity could also limit use of local groundwater basins for storage because of water quality standards set for the basin. For all of these reasons, MWD's Board of Directors approved a Salinity Management Policy that set a specified salinity objective and identified the need to manage both imported and local water sources comprehensively.

For EMWD, salinity management is part of groundwater management. Included in efforts to control salinity in the groundwater basins used to supply water, is the construction of EMWD's desalination plants. Other efforts to control or reduce salinity levels included monitoring of recharge source water salinity levels and recycled water use in the basins. At this time, EMWD does not expect salinity levels to reduce local water source reliability, and the desalination efforts will actually improve and protect the quality of the groundwater.

Perchlorate

Ammonium perchlorate has also been identified as a regional water quality concern. Perchlorate has been found in MWD's Colorado River water supply, and has contaminated groundwater basins, limiting local supply. In response to concerns over perchlorate in drinking water, MWD adopted a Perchlorate Action Plan in 2002. Today,

the concentrations of perchlorate in Colorado River Water are less than California's detection limit.

Assessing the impact of perchlorate in local groundwater basins is part of the Perchlorate Action Plan. Total well production lost to well closures because of perchlorate is 57,000 AFY. Although treatment is available for perchlorate, it can be costly. Local agencies may not pursue treatment because of cost considerations.

EMWD had detected perchlorate in three potable production wells located adjacent to the March Air Reserve Base. Positive test values range from 5-11 ug/L. Regulatory agencies have not characterized a perchlorate plume associated with EMWD wells. These wells also show elevated levels of nitrate and trace levels of Dichlorobromophenol (DCB), a nematocide. These contaminants likely result from past agricultural use of the surrounding properties. The combined output of these wells is approximately 2.4% of EMWD's total water supply. Production from the wells is blended with imported water from MWD Mills Filtration Plant under permit by the State Department of Health Services. Treatment is not required, and monitoring indicates no increase in contaminant levels over time.

Total Organic Carbon and Bromide

When source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or chloramines, disinfection byproducts (DBP) form. In studies, DBPs have been linked to cancer and chlorinated water has been associated with reproductive and developmental effects. In 1998, the Environmental Protection Agency adopted more stringent regulations for DBPs and is expected to promulgate even more stringent requirements in the near future.

The existing levels of TOC and bromide in SWP water present concerns for MWD's ability to maintain safe drinking water supplies. Although CALFED has adopted water quality goals for TOC and bromide and called for a wide arrangement of actions to improve SWP water quality, MWD would like CALFED to adopt more stringent water quality improvement milestones.

In addition to efforts to protect source water, MWD has committed to installing ozone treatment systems in each of MWD's treatment plants by 2011. Currently TOC levels can be managed by blending.

EMWD has treated 100% SWP water at the existing microfiltration plant in Perris. Since conventional methods to treat water were not used, instead, membrane technology was employed. DBP's were not over the limit. It is anticipated that the proposed plant at Hemet/San Jacinto will see similar results. Therefore, DBP's are not anticipated to be a threat to EMWD's water supply.

Methyl Tertiary Butyl Ether and Tertiary Butanol

Until recently, Methyl Tertiary Butyl Ether (MTBE) was the primary oxygenate in nearly all of the gasoline used in California. MTBE, used to reduce air pollution, has caused a serious water contaminant. MTBE is very soluble in water and has a low affinity for soil particles allowing the chemical to move quickly in groundwater. MTBE is also resistant to chemical and microbial degradation, making contamination treatment difficult.

MWD monitors its water supply for MTBE and other oxygenates contamination regularly. MTBE testing results have ranged from non-detectable to 3.9 ug/L, below the primary PHG of 12 ug/L. At Diamond Valley Lake and Lake Skinner, MWD has limited recreational use to reduce the potential for MTBE.
MTBE presents a problem to local groundwater basins. A gallon of gasoline (11% MTBE by volume) can contaminate 16.5 million gallons of water at 5 ug/L. Within MWD's service area, local groundwater producers have been forced to close some wells. Although improved underground storage requirements and monitoring and the phasing out of MTBE as a fuel additive, which should decrease the contamination of groundwater, it is difficult to determine how large the MTBE problem may be. Treatment methods have been found to reduce contaminant levels 80 to 90 percent, but increasing the use of imported water may prove to be more cost effective to some agencies.

EMWD has not found MTBE or TBA contamination in any local sources of water.

Arsenic

The new federal MCL for arsenic in domestic water supplies is 10 ug/L with an effective date of 2006. MWD water supplies have low levels of arsenic and will not require treatment to comply with this new standard. However, some member agencies may face greater problems with arsenic compliance. The cost of arsenic removal may cause some member agencies to increase use of imported water.

EMWD has a well that has arsenic detected in it, and may exceed the arsenic regulations and have to be taken out of service if treatment is not put in place at the wellhead.

Radon

The United States Environmental Agency has proposed a radon MCL of 300 pCi/L. MWD's water supplies have a radon level less than the proposed level, but some sub agencies may need to treat local water sources. Since there is a cost-effective method of treating radon, water supply reliability may not be affected by radon regulations.

EMWD has five wells that violate the 300 pCi/L levels for radon and may require further treatment.

Uranium

There is a 10.5 million ton pile of uranium mine tailings at Moab, Utah that lies 600 feet from the Colorado River. Rainwater has seeped through the pile and contaminated the local groundwater, causing contaminants to flow into the river. There is also a threat that million of tons of material containing uranium will be washed into the Colorado River by a flood. Currently, operations and maintenance activities include intercepting some of the groundwater before it discharges into the river, and the Department of Energy has agreed to move the tailings. Remediating the site will require Congressional appropriations, and maintaining Congressional support for a cleanup will require close coordination and cooperation with other Colorado River users.

Uranium levels in at MWD's intake range from 1 to 5 pCi/L, below the California drinking water standard which is 20 pCi/L. EMWD has found levels close to 9 pCi/L at Well 75 that will be treated with reverse osmosis at the Menifee Desalter.

N-nitrosodimethylamine

N-nitrosodimethylamine (NDMA) is a by-product of water and wastewater treatment and has been detected in MWD's water supply system. MWD's RUWMP states that some NDMA control measures, or removal may be required to avoid impacting Southern California's water supply.
NDMA has not been detected in EMWD's local water sources.

Hexavalent Chromium

Hexavalent Chromium or Chromium VI is a possible contaminant in groundwater and surface water. Chromium VI enters water sources through industrial discharges, leaching form hazardous waste sites and erosion of natural deposits. The California OEHHA is currently reviewing a maximum contaminant level for total chromium and has not determined a MCL for Chromium VI.

There are no proven technologies for reducing Chromium VI in water supplies to low levels. However, the American Water Works Association Research Foundation has initiated a research program in Chromium VI removal.

EMWD has very low levels of Chromium VI detected in one well.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products are a source of concern in both source and recycled water. Monitoring and treatment of these contaminants would have an unknown effect on the cost of water and wastewater treatment. It is difficult to predict the effect pharmaceuticals and personal care products will have on water supply reliability based on the limited information available.

MWD's RUWMP

Additional information on water quality issues and concerns and mitigation efforts can be found in MWD's RUWMP in Section IV..

Section 14 - Water Service Reliability - Normal Water Year

As discussed previously in this report, EMWD has the supply needed to meet the demand of its customers through 2030. This conclusion is based on the assurances of MWD that it will be able to supply member agency demands, the reliability of local groundwater supplies achieved through groundwater management plans and the development of recycled water resources. Tables 14.1 through 14.3 compare the water supply and demand for normal water years through 2030.

Tables 14.1 through 14.3

Table 14.1 – Projected Normal Water Year Supply – AFY

	2010	2015	2020	2025	2030
Supply	168,800	195,000	215,800	231,900	245,200
% of Normal Year	100%	100%	100%	100%	100%

Table 14.2 – Projected Normal Water Year Demand – AFY

	2010	2015	2020	2025	2030
Demand	168,800	195,000	215,800	231,900	245,200
% of Normal Year	100%	100%	100%	100%	100%

Table 14.3 – Projected Normal Water Year Supply and Demand Comparison - AFY

	2010	2015	2020	2025	2030
Supply Total	168,800	195,000	215,800	231,900	245,200
Demand Total	168,800	195,000	215,800	231,900	245,200
Difference	0	0	0	0	0
Difference % of Supply	0%	0%	0%	0%	0%
Difference % of Demand	0%	0%	0%	0%	0%

Section 15 - Water Service Reliability - Single Dry Water Year

In addition to meeting the demand for a normal dry year, the law requires that water suppliers meet the need of its customers during a single dry year. For EMWD, meeting the small increase in demand due to a dry winter is accomplished through increasing imports from MWD and utilizing groundwater production. MWD assures its member agencies that, even in dry years, their needs will be met. The groundwater management plans assure that water recharged into the basins in wet years will be available in dry years. Tables 15.1 through 15.3 compare the water supply and demand for single dry water years through 2030.

Tables 15.1 through 15.3

Table 15.1 – Projected Single Dry Water Year Supply – AFY

	2010	2015	2020	2025	2030
Supply	171,900	198,400	219,400	235,800	249,200
% of Normal Year	102%	102%	102%	102%	102%

Table 15.2 – Projected Single Dry Water Year Demand – AFY

	2010	2015	2020	2025	2030
Demand	171,900	198,400	219,400	235,800	249,200
% of Normal Year	100%	100%	100%	100%	100%

Table 15.3 – Projected Single Dry Water Year Supply and Demand Comparison – AFY

	2010	2015	2020	2025	2030
Supply Total	171,900	198,400	219,400	235,800	249,200
Demand Total	171,900	198,400	219,400	235,800	249,200
Difference	0	0	0	0	0
Difference % of Supply	0%	0%	0%	0%	0%
Difference % of Demand	0%	0%	0%	0%	0%

Section 16 - Water Service Reliability - Multiple Dry Water Years

In the case of multiple dry years, resource planning by EMWD and MWD insures that consumer demands for water will be met. Since local resources are stable during a multiple dry year event and MWD resources are affected by weather fluctuations, the 1990-1992 hydrology was considered. These are the dry years considered by MWD in planning for the worst case multiple dry year scenarios.

Tables 16.1 through 16.3 compare the water supply and demand for multiple dry years ending in 2010.

Tables 16.1 through 16.3

Table 16.1 – Projected Supply During a Multiple Dry Year Period Year Ending in 2010 - AFY

	2006	2007	2008	2009	2010
Supply	147,200	153,400	159,600	165,700	171,900
% of Normal Year	102%	102%	102%	102%	102%

Table 16.2 – Projected Demand During a Multiple Dry Year Period Year Ending in 2010 – AFY

	2006	2007	2008	2009	2010
Demand	147,200	153,400	159,600	165,700	171,900
% of Normal Year	102%	101%	101%	101%	101%

Table 16.3 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2010 – AFY

	2006	2007	2008	2009	2010
Supply Total	147,200	153,400	159,600	165,700	171,900
Demand Total	147,200	153,400	159,600	165,700	171,900
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.4 through 16.6 compare the water supply and demand for multiple dry years ending in 2015.

Tables 16.4 through 16.6

Table 16.4 – Projected Supply During a Multiple Dry Year Period Year Ending in 2015 - AFY

	2011	2012	2013	2014	2015
Supply	211,000	215,200	219,400	222,700	226,000
% of Normal Year	102%	102%	102%	102%	102%

Table 16.5 – Projected Demand During a Multiple Dry Year Period Year Ending in 2015 – AFY

	2011	2012	2013	2014	2015
Demand	177,200	182,500	187,800	193,100	198,400
% of Normal Year	102%	101%	101%	101%	101%

Table 16.6 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2015 – AFY

	2011	2012	2013	2014	2015
Supply Total	211,000	215,200	219,400	222,700	226,000
Demand Total	177,200	182,500	187,800	193,100	198,400
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.7 through 16.9 compare the water supply and demand for multiple dry years ending in 2020.

Tables 16.7 through 16.9

Table 16.7 – Projected Supply During a Multiple Dry Year Period Year Ending in 2020 - AFY

	2016	2017	2018	2019	2020
Supply	20,600	206,800	211,000	215,200	219,400
% of Normal Year	102%	102%	102%	102%	102%

Table 16.8 – Projected Demand During a Multiple Dry Year Period Year Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Demand	20,260	20,600	211,000	215,200	219,400
% of Normal Year	102%	101%	101%	101%	101%

Table 16.9 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Supply Total	202,600	206,800	211,000	215,200	219,400
Demand Total	202,600	206,800	211,000	215,200	219,400
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.10 through 16.12 compare the water supply and demand for multiple dry years ending in 2025.

Tables 16.10 through 16.12

Table 16.10 – Projected Supply During a Multiple Dry Year Period Year Ending in 2025 - AFY

	2021	2022	2023	2024	2025
Supply	222,700	226,000	229,200	232,500	235,800
% of Normal Year	102%	102%	102%	102%	102%

Table 16.11 – Projected Demand During a Multiple Dry Year Period Year Ending in 2025 – AFY

	2021	2022	2023	2024	2025
Demand	222,700	226,000	229,200	232,500	235,800
% of Normal Year	102%	101%	101%	101%	101%

Table 16.12 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2025 – AFY

	2021	2022	2023	2024	2025
Supply Total	222,700	226,000	229,200	232,500	235,800
Demand Total	222,700	226,000	229,200	232,500	235,800
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.13 through 16.15 compare the water supply and demand for multiple dry years ending in 2030.

Tables 16.13 through 16.15

Table 16.13 – Projected Supply During a Multiple Dry Year Period Year Ending in 2030 - AFY

	2026	2027	2028	2029	2030
Supply	238,400	241,100	243,800	246,500	249,200
% of Normal Year	0%	101%	101%	101%	101%

Table 16.14 – Projected Demand During a Multiple Dry Year Period Year Ending in 2030 – AFY

	2026	2027	2028	2029	2030
Demand	238,400	241,100	243,800	246,500	249,200
% of Normal Year	0%	101%	101%	101%	101%

Table 16.15 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2030 – AFY

	2026	2027	2028	2029	2030
Supply Total	238,400	241,100	243,800	246,500	249,200
Demand Total	238,400	241,100	243,800	246,500	249,200
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

With the assurance of MWD and the reliability of EMWD's groundwater and recycled water, EMWD is confident of its ability to meet demand through 2030.

Appendix A

Public Outreach and Participation

Appendix A

Public Involvement

Coordination with Appropriate Agencies

EMWD has worked with several agencies and organizations in preparing the Urban Water Management Plan. These agencies include all of EMWD's sub agencies and MWD.

	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not Involved / No Information
Sub Agencies of EMWD				x	x	x	
Metropolitan Water District				x	x	x	
Relevant public agencies					x	x	

Coordination with MWD

Over the past year EMWD has worked with MWD to provide information regarding population, local supply and demands. MWD projects demand on a regional basis and does not project sales for individual agencies. The 2005 RUWMP contains information about total projected sales to other agencies including EMWD. Included in MWD supply projections are existing and committed local projects.

Coordination with Sub- Agencies

EMWD staff met with each sub agency early in the year to discuss supply and demand projects. In addition to early meeting, EMWD has sent information and draft copies of the UWMP to sub agencies. EMWD has also requested information from subagencies regarding expected supply. When a subagency has provided demand projections, EMWD staff compared the projection with the EMWD projection for the agency and used the larger of the two projections. In the event that demand and supply projections were not available from a subagency, EMWD used method to project demand as was used in the retail portions of EMWD.

County of Riverside and Local Cities

In addition to meeting with the cities that are subagencies of EMWD, EMWD staff sent copies of the draft plan with information about the public hearing held December 7, 2005.

Public Outreach

Public Outreach efforts include:

- Article in the November 2005 customer newsletter (distribution to 111,000 accounts).
- Draft Urban Water Management Plan posted on the website since September 30,2005 with contact information.
- Fliers distributed to:
  - Hemet-SJ Valley Chamber Luncheon
  - Valley Economic Development Corp. Board members
  - Southwest County Economic Development Corp. Board members
  - Attendees of the State Water Project inspection trip
- EMWD lobbies
- Presentations at the Slawson-Record Director Advisory Committee and Record-Siems Director Advisory Committee
- Public Notice published November 6 and 16, 2005.

Public Commentary

EMWD received comments on the Urban Water Management Plan from the Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society represented by Sue Nash and the City of Hemet.

On the following pages is a schedule of meetings and copies of letters sent to agencies and cities. Included at the end of this appendix are the comments made and EMWD's response.

2005 Urban Water Management Plan
Public Involvement Schedule

Dec. 1 – 31, 2004	**Finalize Preliminary Supply and Demand Projections**
Jan 11, 2005	**Meet with MWD Staff**
Jan 26, 2005	**Present UWMP to Board Planning Committee**
Jan. 20-28, 2005	**EMWD Staff Briefing** A) Present Strategy and Schedule B) Discuss Assignments (Involved Work Groups)
Feb. 1, 2005	**DWR Workshop**
Feb. 2 – March 8, 2005	**Sub Agency Technical Staff Briefing** A) Present Strategy and Schedule B) Discuss Preliminary Projections C) Solicit Sub Agency Input D) Dates Feb 4, 2005 City of Perris Feb 9, 2005 City of Hemet Feb 8, 2005 Lake Hemet Municipal Water District Feb 28, 2005 City of San Jacinto March 8, 2005 Nuevo Water Company
May 23, 2005	**MWD RUWMP Workshop**
Aug 12, 2005	**Release Preliminary Draft UWMP for Comments**
Sept 23-Oct 28	**Public Presentations of Draft UWMP**
Sept 30, 2005	**Draft Available on EMWD Website**
Nov 3, 2005	**Letters and Draft Sent to County and Cities**
Nov 6 and 16, 2005	**Public Notice Published**
December 7, 2005	**Public Hearing**
December 21,2005	**Adoption**

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February 15, 2005

Mr. Wayne Spencer
General Manager
Murrieta County Water District
P. O. Box 949
Murrieta, CA 92564

Subject: Urban Water Management Plan

Dear Wayne:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within Murrieta County Water District (MCWD). In order to share information, we have set up a meeting with you on February 25, 2005 at 2:00 PM at MCWD. We look forward to working with you at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD that MCWD may need to prepare your UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Director Randy A. Record
Director Rodger D. Siems
Director Ronald W. Sullivan

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Redwine and Sherrill

February 15, 2005

Mr. Daniel Delao
President, Board of Directors
Nuevo Water Company
30427 11th Street
Nuevo, CA 92567

Subject: Urban Water Management Plan

Dear Mr. Delao:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water, either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP, accurately reflects what is occurring or expected to occur within Nuevo Water Company (NWC). In order to share information, EMWD will be setting a meeting with NWC staff in the coming weeks. We look forward to working with NWC at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD, which NWC may need to prepare a UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an

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annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. Ed Piester, Nuevo Water Company
Director Randy Record
Director Rodger Siems
Director Ron Sullivan

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Redwine and Sherrill

February 15, 2005

Mr. Hector Apodaca, City Manager
City of Perris
101 North "D" Street
Perris, CA 92570

Subject: Urban Water Management Plan

Dear Mr. Apodaca:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP, accurately reflects what is occurring or expected to occur within the City of Perris. In order to share information, EMWD has already met with Kirk Cloyd from the City. We provided our information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We also discussed the schedule for plan preparation and providing information from EMWD, which the City may need to prepare a UWMP, should you decide to complete one. In the coming month, we will be working with representatives from all of our agencies to prepare a draft document. In June of 2005 we hope to release the draft for comments and review.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an annexation into MWD, comply with "Best Management Practices" conservation measures be

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applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us we hope to work with you in expanding the role of conservation within this region.

We appreciate the effort the City of Perris has made in meeting with us. We anticipate your feedback on the information we provided and encourage any comments or questions you may have about EMWD's UWMP. If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. Kirk Cloyd, City of Perris
Director Randy Record
Director Rodger Siems
Director Ronald Sullivan

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February 15, 2005

Mr. Steve Temple, City Manager
City of Hemet
445 E. Florida Avenue
Hemet, CA 92543

Subject: Urban Water Management Plan

Dear Steve:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within the City of Hemet. In order to share information, EMWD met with Linda Nixon from the City. We provided to her, our information about growth projections and demand projections that we are anticipating for your agency in order to receive your feedback. We also discussed the schedule for plan preparation and provided information from EMWD, which the City will need to prepare your UWMP. In the coming months we will continue to work with representatives from all of our agencies to prepare a draft document. In June of 2005, we hope to release the draft for comments and review.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be

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applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

We appreciate the effort the City of Hemet has made in meeting with us. We anticipate your feedback on the information we provided and encourage any comments or questions you may have about EMWD's UWMP. If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext. 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Ms. Linda Nixon, City of Hemet
Director Randy Record
Director Rodger Siems
Director Ron Sullivan

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February 15, 2005

Mr. Rob Lindquist
General Manager
Lake Hemet Municipal Water District
P. O. Box 5039
Hemet, CA 92544-5039

Subject: Urban Water Management Plan

Dear Rob:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within Lake Hemet Municipal Water District (LHMWD). In order to share information, EMWD will be meeting with staff from LHMWD on February 17, 2005 at 1:00 PM at LHMWD. We encourage you and your staff to participate in this meeting and the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD that LHMWD may need to prepare your UWMP.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow it is important that all existing and future development utilize conservation methods. Metropolitan

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Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at 951-928-3777 Ext. 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. John Loncar, LHMWD
Director Randy Record
Director Rodger Siems
Director Ronald Sullivan

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Legal Counsel
Redwine and Sherrill

February 15, 2005

Mr. Peter Cosentini, City Manager
City of San Jacinto
P.O. Box 488
San Jacinto, CA 92581

Subject: Urban Water Management Plan

Dear Peter:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP, accurately reflects what is occurring or expected to occur within the City of San Jacinto. In order to share information, EMWD will be setting a meeting with city staff in the coming weeks. We encourage the participation of you and your staff at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD, which the City may need to prepare a UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an

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annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. Tim Hults
Director Randy Record
Director Rodger Siems
Director Ronald Sullivan

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Redwine and Sherrill

February 15, 2005

Mr. Wayne Spencer
General Manager
Murrieta County Water District
P. O. Box 949
Murrieta, CA 92564

Subject: Urban Water Management Plan

Dear Wayne:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within Murrieta County Water District (MCWD). In order to share information, we have set up a meeting with you on February 25, 2005 at 2:00 PM at MCWD. We look forward to working with you at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD that MCWD may need to prepare your UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Director Randy A. Record
Director Rodger D. Siems
Director Ronald W. Sullivan

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EASTERN MUNICIPAL
WATER DISTRICT

SINCE 1950

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David L. Slawson

Richard R. Hall
Rodger D. Stotts
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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

August 12, 2005

Nick Larkin
P&D Consultants
8954 Rio San Diego Drive, Suite 610
San Diego, CA 92108

Subject: Draft Urban Water Management Plan for Eastern Municipal Water District

Dear Mr. Larkin,

Per your request, enclosed is a draft copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This is the first draft of this document and should not be considered final for any purpose. The information contained in the draft is considered preliminary and subject to change.

EMWD is accepting comments on this draft through August 31, 2005 and will publish a subsequent draft after September 16, 2005 for public review and comment. The final Plan is expected to be submitted to EMWD's Board of Directors at the end of November.

Please send any comments or questions on this draft to me by e-mail at lovstede@emwd.org or contact me by phone at 951-928-3777 Ext. 4307.

Sincerely,

Linda Robbins

for, Elizabeth Lovsted
Facilities Planner/Engineer
Resource Development

EL:lar

Enclosure

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EASTERN MUNICIPAL
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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler CPA

Legal Counsel
Redwine and Sherrill

August 12, 2005

Jim Blanke
WRIME
1451 Riverbank Drive, Suite 142
Sacramento, CA 95815

Subject: Draft Urban Water Management Plan for Eastern Municipal Water District

Dear Mr. Blanke,

Per your request, enclosed is a draft copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This is the first draft of this document and should not be considered final for any purpose. The information contained in this draft is considered preliminary and subject to change.

EMWD is accepting comments on this draft through August 31, 2005 and will publish a subsequent draft after September 16, 2005 for public review and comment. The final Plan is expected to be submitted to EMWD's Board of Directors at the end of November.

Please send any comments or questions on this draft to me by e-mail at lovstede@emwd.org or contact me by phone at 951-928-3777 Ext. 4307.

Sincerely,

Linda Robbins

for Elizabeth Lovsted
Facilities Planner/Engineer
Resource Development

EL:lar

Enclosure

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Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

August 12, 2005

Jenny Arevalo
861 Village Oaks Drive, Ste. 100
Covina, CA 91724

Subject: Draft Urban Water Management Plan for Eastern Municipal Water District

Dear Ms. Arevalo:

Per your request, enclosed is a draft copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (EMWD). This is the first draft of this document and should not be considered final for any purpose. The information contained in this draft is considered preliminary and subject to change.

EMWD is accepting comments on this draft through August 31, 2005 and will publish a subsequent draft after September 16, 2005 for public review and comment. The final Plan is expected to be submitted to EMWD's Board of Directors at the end of November.

Please send any comments or questions on this draft to me by e-mail at lovstede@emwd.org or contact me by phone at 951-928-3777 Ext. 4307.

Sincerely,

Linda Robbins

for Elizabeth Lovsted
Facilities Planner/Engineer
Resource Development

EL:lar

Enclosure

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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

August 10, 2005

Tim Hulte
Community Development Director
City of San Jacinto
201 E. Main Street
San Jacinto, CA 92583

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Mr. Hulte;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
   a. Basic demands
   b. Agricultural Water Demands
4) Brief descriptions of the assumptions underlying the projections, if available.

This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Attachments

EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

Board of Directors

President
Randy A. Record

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David J. Slawson

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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

August 10, 2005

Mitch Freeman
Lake Hemet Municipal Water District
2480 East Florida Avenue
P.O. Box 5039
Hemet, CA 92544

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Mr. Freeman;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

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If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Attachments

EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

August 10, 2005

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Ed Piester
Nuevo Water Company
30427 11th Street
Nuevo, CA 92567

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Mr. Piester;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
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If you have any questions, please contact me at (951) 928-3777. Ext. 4307. Thank vou for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Attachments

EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

August 10, 2005

Board of Directors

President
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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Kirk Cloyd
Public Works Superintendent
City of Perris
1015 S. "G" Street
Perris, CA 92570-2410

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Mr. Cloyd;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
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If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Attachments

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 *Telephone:* (951) 928-3777 *Fax:* (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 *Internet:* www.emwd.org

EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

August 10, 2005

Board of Directors

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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Linda Nixon
Management Assistant
City of Hemet
Public Works/Engineering
510 E Florida Ave.
Hemet, CA 92543

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Ms. Nixon,

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
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4) Brief descriptions of the assumptions underlying the projections, if available.

This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Attachments

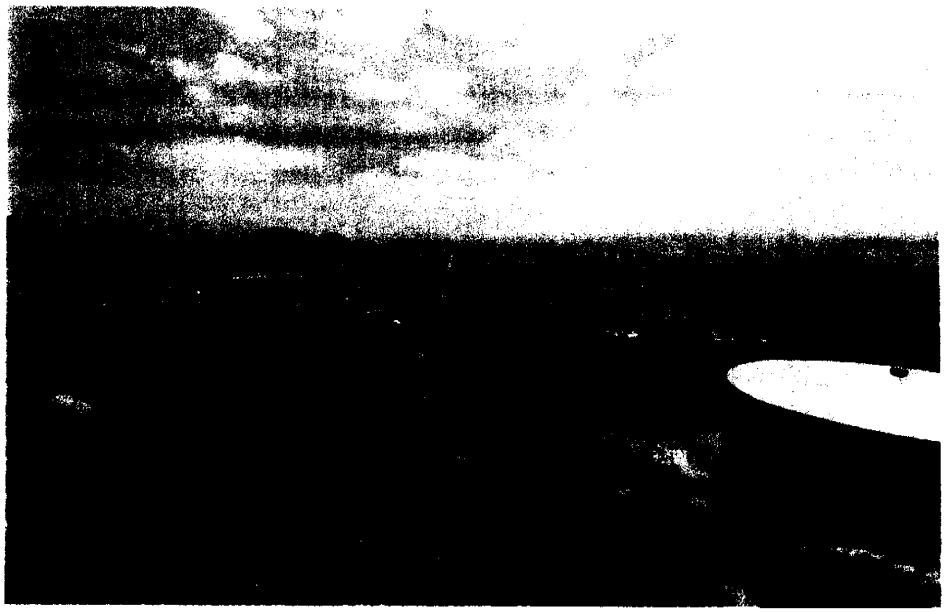
Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Eastern Municipal Water District

Urban Water Management Plan

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

To request a copy of the draft plan or if you have any comments or questions about the Urban Water Management Plan, please contact Elizabeth Lovsted at lovstede@emwd.org or 951-928-3777, ext. 4307. In addition, the draft UWMP for 2005 will be available on EMWD's web site, emwd.org, by September 31, 2005 for review and comments.



Eastern Municipal Water District (EMWD) is located in one of the fastest growing regions in the nation, and with a growing population comes a growing demand for water. Over the next 25 years, demand for water within EMWD's service area will increase more than 75 percent. EMWD has a mission to provide safe and reliable fresh water, wastewater management services and recycled water to our community in an economic, efficient, and responsible manner, now and in the future.

To meet the needs of the growing population, EMWD has developed a plan to supply water using imported water, local groundwater and recycled water. In addition to supplying more water, EMWD encourages efficient water use through rebates for water saving devises, education and other conservation practices.

EMWD has prepared a draft of the ***2005 Urban Water Management Plan*** (UWMP). The plan is an update to the 2000 UWMP and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next 25 years.

To request a copy of the draft plan or if you have any comments or questions about the UWMP, please contact Elizabeth Lovsted at lovstede@emwd.org or (951) 928-3777, ext. 4307. In addition, the draft UWMP for 2005 will be available on EMWD's web site, www.emwd.org, by September 31, 2005 for review and comments.

P.O. Box 8300, Perris, CA 92572
2270 Trumble Road, Perris, CA 92570

951-928-3777, ext. 4307
www.emwd.org

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

AGENDA

BOARD PLANNING COMMITTEE
September 26, 2005
Conf. Rm. 217 – 10:00 a.m.

COMMITTEE MEMBERS:

Rodger D. Siems, Board Member
Randy A. Record, Board Member
Ronald W. Sullivan, Board Member
Tony Pack, General Manager
P. Ravishanker, Deputy General Manager
Charlie Bachmann, Assistant GM of Engineering
Mike Luker, Assistant GM of Operations and Maintenance
Mike Garner, Assistant General Manager of Resource Development and Planning

---

PUBLIC COMMENT - Any subject within the jurisdiction of Eastern Municipal Water District (EMWD). Speakers are requested to limit comments to 3 minutes.

Guest: *None anticipated*

I. Item(s) from the General Manager

II. Water Supply Assessment for Spec 212, Tract Map 30037

III. Urban Water Management Plan

IV. Ethanac Commercial / Business Connection

V Other Item(s)

VI. Tentative date for next meeting: October 27, 3:00 p.m.

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EASTERN MUNICIPAL
WATER DISTRICT

SINCE 1950

Board of Directors

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Randy A. Record

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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

TRANSMITTAL COVER LETTER

Resource Development

DATE: **October 14, 2005**

TO: **Charolette Fox, Director**
League of Women Voters California

FROM: **Beth Lovsted**

SUBJECT: **EMWD - Draft Urban Water Management Plan**

Please Review & Provide Comments ____

For Your Review ____

Per Your Request _X_

Please Sign & Return ____

If you have any questions, please call (951) 928-3777, Ext. **4307**

Beth Lovsted
Facilities/Planner Engineer

J:\WORDPROC\WP\RES_DEV\$FORMS\TRANSLET.WPD

Mailing Address: Post Office Box 8300, Perris, CA 92570 Internet: [illegible]

EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

November 3, 2005

Mr. Jack McGee
Director of Planning
City of Murrieta
26442 Beckman Ct.
Murrieta, CA 92562

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Dear Mr. McGee:

Eastern Municipal Water District (EMWD) has prepared a draft of the 2005 Urban Water Management Plan (UWMP). This plan is an update to the 2000 UWMP for EMWD and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next twenty-five years.

EMWD has a mission to provide safe and reliable water and wastewater management services to our community in an economic, efficient, and responsible manner, now and in the future. Over the next twenty-five years the demand for water in EMWD's service area will increase by over 100,000 acre-feet per year. That is a more than 75 percent increase in water demand. To meet the growing demand, EMWD has to supply water with innovation, reliability and efficiency. EMWD has three water supply sources; water imported through Metropolitan Water District of Southern California from Northern California and the Colorado River, local groundwater, and recycled water. Imported water supplies include both potable water treated by MWD and non-potable water. Non-potable water is either treated by EMWD for potable use, used for agricultural that does not require potable water, or percolated down into the groundwater basins for future groundwater extraction. Groundwater supplies consist of potable quality groundwater used for direct customer consumption and desalinated, low-quality ground water treated for potable use. Recycled water is also an important water supply for non-potable purposes. In addition to supplying more water, EMWD is determined to encourage efficient water use through rebates for water saving devises, education and other conservation practices described in the UWMP.

Please review the enclosed copy of the EMWD 2005 Draft Urban Water Management Plan. The final plan will be used to support any water supply assessments and verifications required after its adoption. There will be a public meeting to consider the approval of the 2005 Urban Water Management Plan on December 7, 2005 at 1:00 p.m. or as soon thereafter as possible, in Eastern Municipal Water District's Board Room. EMWD staff is also available to meet with you individually to discuss the UWMP upon request. Please send any comment or concerns you would like addressed in the UWMP to Elizabeth Lovsted at lovstede@emwd.org or 951-928-3777, Ext. 4307 by December 7, 2005.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Enclosure

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Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

November 3, 2005

Ms. Debbie Ubnoske
Director of Planning
City of Temecula
43174 Business Park Dr.
Temecula, CA 92591

Dear Ms. Ubnoske:

Eastern Municipal Water District (EMWD) has prepared a draft of the 2005 Urban Water Management Plan (UWMP). This plan is an update to the 2000 UWMP for EMWD and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next twenty-five years.

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Enclosure

J:\WORDPROC\WORD\Res_dev\Lovsted\UWMP\CitiesPlanningDirectors.doc

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

November 3, 2005

Mr. Robert Johnson
Planning Director
Planning Department
County of Riverside
4080 Lemon Street
Riverside, CA 92502-1629

Dear Mr. Johnson:

Eastern Municipal Water District (EMWD) has prepared a draft of the 2005 Urban Water Management Plan (UWMP). This plan is an update to the 2000 UWMP for EMWD and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next twenty-five years.

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Enclosure

J:\WORDPROC\WORD\Res_dev\Lovsted\UWMP\CitiesPlanningDirectors.doc

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

November 3, 2005

Ms. Olivia Barnes
Director of Community Development
City of Perris
101 N. "D" Street
Perris, CA 92572

Board of Directors

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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

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Redwine and Sherrill

November 3, 2005

Mr. John Terell
Planning Official
City of Moreno Valley
14177 Frederick Blvd.
Moreno Valley, CA 92555

Dear Mr. Terell:

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Legal Counsel
Redwine and Sherrill

November 3, 2005

Mr. Richard Masyczek
Director of Planning
City of Hemet
445 E. Florida Avenue
Hemet, CA 92543

Dear Mr. Masyczek:

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Redwine and Sherrill

November 3, 2005

Mr. Tim Hults
Community Development Director
City of San Jacinto
201 E. Main Street
San Jacinto, CA 92583

Dear Mr. Hults:

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Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Ad Number:B06/B06766137 Operator:tmillard
Customer:EMWD
Purge:03-02-06 SalesPerson:CASTRO MV45
Size:A 3.00 X 7.50 RunDate:11-06-05

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

NOTICE OF A PUBLIC HEARING TO CONSIDER APPROVAL OF THE EASTERN MUNICIPAL WATER DISTRICT'S 2005 URBAN WATER MANAGEMENT PLAN

Eastern Municipal Water District (EMWD) is located in one of the fastest growing regions in the nation, and with a growing population, comes a growing demand for water. Over the next 25 years, demand for water within EMWD's service area will increase more than 75 percent. EMWD has a mission to provide safe and reliable fresh water, wastewater management services and recycled water to our community in an economic, efficient, and responsible manner, now and in the future.

EMWD has prepared a draft of the 2005 Urban Water Management Plan (UWMP). The plan is an update to the 2000 UWMP for EMWD and has been developed in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, and supply and reliability for the next twenty-five years. The UWMP is available for review on EMWD's web site, www.emwd.org.

A public meeting of the EMWD Board of Directors to consider the approval of EMWD's 2005 Urban Water Management Plan, will be held on December 7, 2005 at 1:00 p.m. or as soon thereafter as possible, in the Board Room at EMWD's headquarters:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572

Public input is encouraged, appreciated and will be considered during finalization of the 2005 UWMP. Any comments on the UWMP or requests for more information should be sent to:

Eastern Municipal Water District
Attention: Ms. Elizabeth Lovsted
lovstede@emwd.org
P.O. Box 8300
Perris, CA 92572-8300

E-mail or written comments are due by December 7, 2005.

Comments from the City of Hemet

-----Original Message-----
From: Linda Nixon [mailto:LNixon@cityofhemet.org]
Sent: Wednesday, December 07, 2005 4:37 PM
To: Lovsted, Elizabeth
Subject: EMWD 2005 Draft UWMP

Hi Elizabeth -

We have reviewed the EMWD 2005 Draft UWMP (dated 07-15-2005) and have the following comments:

1. Page 18 - Water Levels -

Reference to Figure 3.3, should be changed to 3.4.

2. Page 18 - Table 3.2 - Average Changes in Groundwater Storage, 2003-2004

Decrease of -5,900 AF in Hemet South subbasin seems too high. Would like to see data recorded in terms of change in static well levels included in this chart in addition to AF.

3. Page 24 - Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management

Total GW Production for Hemet South is listed at 90 AF and a notation indicates this is a partial figure. However the paragraph immediately above the chart indicates "This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD." If this is true, 90 AF does not appear to be an accurate figure. Please
clarify.

4. Page 25 - Groundwater Pumping Rights

In first and third paragraphs of this section, we question the accuracy of statements concerning "appropriative rights." Please clarify.

Thanks for the opportunity to comment.

Linda Nixon
City of Hemet
Public Works Engineering Department
510 E. Florida Avenue
Hemet, CA 92543

Response to the City of Hemet

Linda,
In response to your comments:

1. Page 18 - Water Levels -

Reference to Figure 3.3, should be changed to 3.4.

There was some changes to the order of the figures Figure 3.2 is the Hemet/San Jacinto Water Management Area Water level Contour Map and Figure 3.5 is the West San Jacinto Basin Water Contour Map. The references have been changed.

2. Page 18 - Table 3.2 - Average Changes in Groundwater Storage, 2003-2004

Decrease of -5,900 AF in Hemet South sub basin seems too high. Would like to see data recorded in terms of change in static well levels included in this chart in addition to AF.

This table was copied from the annual report and calculated using the static level from several wells input into a three dimensional model. Fakhri Manghi at MWD makes the estimation on a GIS model and would be glad to give you additional information. You can contact him at manghhif@emwd.org. The annual report is available for review at EMWD.org

3. Page 24 - Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management

Total GW Production for Hemet South is listed at 90 AF and a notation Indicates this is a partial figure. However the paragraph immediately above the chart indicates "This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD." If this is true, 90 AF does not appear to be an accurate figure. Please clarify.

Table 3.3 is for the West San Jacinto Groundwater Management Area, which only contains a small portion of the Hemet South Basin. I have added notation to clarify this.

4. Page 25 - Groundwater Pumping Rights

In first and third paragraphs of this section, we question the accuracy of statements concerning "appropriative rights." Please clarify.

The Groundwater pumping rights section has been revised and no longer refers to appropriative rights.

I hope this addresses your concerns. I am attaching a copy of the revised UWMP Section 3 for your information. The entire document including appendices will be available on emwd.org in the coming weeks and of course we will be sending the city a copy of the document as well.

Thank you for your assistance,
Elizabeth Lovsted, P.E.
Facilities Planner/Engineer
Eastern Municipal Water District
951.928.3777 ext. 4307

Comments from Sue Nash

This letter was presented to the Board on December 7,2005

December 7, 2005
Susan Nash
PO Box 253
Nuevo CA 92567
951-928-3698
snash22@earthlink.net

Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society submit these concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

There was no apparent involvement of diverse social, cultural and economic elements of the population within the service area prior to and during the preparation of the plan. There was one newspaper ad, but we believe the law requires that more than one announcement be placed in the paper as to the time and place of comments and meetings to discuss and adopt the plan. The San Jacinto River Watershed Council (with whom EMWD allegedly cooperated on the recycling plan) was not noticed. Many important documents mentioned were not listed as being in an appendix. Appendix A and D which were mentioned in the text are not in the document. Where are Appendix B and C? Are there any more?

There were two Integrated Regional Water Management Plans mentioned (MWD and Santa Ana) but neither was attached, or even a web page mentioned where one could check them out. Many other documents were mentioned regarding the groundwater management plans and other matters; however, no web page or other information on how the public might read these documents is given.

There is no record of who was contacted and given copies for review or when. Like me, they may not have been told when comments were due and when meetings were to be held, without making phone calls.

The document does not give year by year historical data on how much water has been received from the State Water Project, the Colorado River, from MWD overflow to recharge and from groundwater.

The entire groundwater discussion is extremely difficult to decipher. The management plan for one basin is in a missing appendix, the management plan for the other is simply not there yet, and there is no way to locate all the supporting documents mentioned. Maybe in those documents there is a discussion of the analysis of the groundwater by Dr. Tien C. Lee, University of California, Riverside, CA. It is important that the public know the basis for the groundwater supply projections being made.

The reliability of supply is stated, but not discussed. There is no analysis of how often the supply from MWD has fallen short and by how much. There is no mention (as there was in the California State Water Plan draft) of the impacts of Global Warming causing rising ocean levels and the

permanent flooding of the Bay-Delta levees with saltwater; "peak oil" causing rising energy prices and reducing the affordability of potable water; and the complete lack of northern California Water for many months in the event of a major earthquake in northern California.

Water use by customer type is confusing. The plan seems to first indicate farming is going away, and then it says farming use will stay the same. It is not clear which kind of farming is being discussed—citrus? dairy?

It appears that EMWD does not really want to encourage conservation because it reduces revenue. This is especially true for the reluctance to use conservation measures in case of a complete shut off, such as an earthquake in the Bay Area. The State Water Plan is quite clear that its goal is to provide AFFORDABLE POTABLE water to all Californians and spends a considerable amount of time discussing the high number of Californians without potable water. Over 47% of the residents of the San Jacinto River Watershed live below the poverty level. Instead of demanding that developers use less water, EMWD provides water for sod farmers in the San Jacinto Valley and does not mind that most of the City of Moreno Valley's landscaping water ends up in the streets.

Although desalinization is said to be a reliable source of water, this is contradicted because of the high cost of disposing of the brine water. The elimination of brine is a speculative technology.

The current and projected supply of wholesale water is missing. The contracts with MWD regarding how much water they can supply from each source could not be found. There is apparently no information regarding how much water MWD has promised in the past and failed to deliver. We could find no indication of what the contracts with MWD look like and how they have been fulfilled in the past. This information would have to include the issues of global warming, peak oil and contamination of water.

Most obviously missing is any chart which shows how much water is going to be needed, given the projected growth by SCAG and EMWD's own experts, and how those figures match up with the amount of water MWD is promising to deliver each year. Even if MWD could actually deliver, we could not find any charts or text indicating how demand and supply for the next 20 years match up.

The water shortage contingency plan does not indicate in detail how water is going to be supplied. For instance, if there is an earthquake in the Bay Area, how long will we be without imported water? How much groundwater will have to be shared among how many people? How long will that last? How will industry be affected? And what will happen to food prices when water to agriculture is cut off?

The recycled water plan does not include the documents mentioned, so it is hard to tell what the status actually is.

The water quality impacts on reliability are without any basis. The documents indicate there are serious problems and task forces, but no details about what the extent of the problems are, how much water supply could be reduced and what is or can be done to solve these problems. (see Friends of the Santa Clara River v. Castaic Lake Water Agency, 2004)

There are a lot of charts, but no text on where EMWD's water is coming from and how. These "assurances" of plenty of water are inconsistent with both the State Water Plan (draft) and the Open Space Water Supply element of the Riverside County General Plan. In which case, there are "assurances" with no reliable basis and which do not meet the requirements of the UWMP Act.

In order for the public to read this document with any understanding and to have any assurance that it complies with the UWMP Act and that it can meet the requirements of Senate Bills 610 and

221, it should be organized according to the "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan (January 18, 2005). The 2005 Urban Water Management Plan "Review for Completeness" Form for DWR Review Staff Use, with all references and page numbers, should be provided to the public. Only in this way can the public have any confidence that EMWD's "rosy" projections of "affordable potable" water for the next twenty years have any basis in fact.

December 19, 2005

Susan Nash
PO Box 253
Nuevo CA 92567
951-928-3698
snash22@earthlink.net

Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group and the San Bernardino Valley Audubon Society submit these additional concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

After we received a copy of the Metropolitan Water District of Southern California Regional Urban Water Management Plan (2005) and the updated Eastern Municipal Water District Urban Water Management Plan (2055), we still find significant deficiencies in compliance with the Urban Water Management Plan Act in both documents.

Eastern states that it relies on MWD for 80% of its potable water supply. However, an unknown portion of its groundwater supply is based on recharge using surplus MWD water. Eastern states this surplus will be available for 4 out of 5 years, but gives no basis whatsoever for this assertion. (page 12)

Eastern states:
"Based on the information detailed in MWD's RUWMP, EMWD is confident that MWD will provide EMWD with enough non-discounted, non-interrupted water supplies to meet demands through 2030. EMWD's only interruptible supply is discounted agricultural water, which accounts for approximately 4% of the District total supply, and the recharge water used for the San Jacinto Basin. It is anticipated that recharge water may not be available in one out of every five years. If there is a shortage of imported water that cannot be supplemented by local supplies, EMWD will make up the deficiency by implementing the water shortage contingency plan." (p. 35, italics added)

However, EMWD's Water Shortage Contingency Plan states:
"Even under the driest three-year cycle, EMWD supply is anticipated to meet demand. With the groundwater management plans in place, the West San Jacinto area has rising water levels and wells are not anticipated to decrease production, and the Hemet/San Jacinto area will be recharged in years of surplus to prepare or recover from dry years. Since local water supplies are stable and fixed, the small increase in demand during dry years will be met through imported water from MWD. Under the Integrated Resources Plan (IRP) and Water Surplus and Drought Management Plan (WSDM) water, imported by MWD, will be available to meet 100% of member agencies demands, even during dry periods." (p. 64-65, italics added)

Eastern cannot have their cake and eat it too. They cannot say both that if there is a shortage of imported water, they will rely on the water shortage contingency plan; and at the same time have the water shortage contingency plan state that if there is a shortage of local groundwater, they will rely on imported water. This is certainly one of the most significant faults of the EMWDS UWMP!

Eastern refers to MWD's regional planning and allocation of water and refers the reader to Appendix A.1 of the RUWMP. (p. 62) However, when one looks to Appendix A.1, there is no assurance from MWD that the projected demands of MWD for water will be met. There is no indication of how much of Eastern's demands for imported water are also committed as a wholesale provider to subagency water departments, districts or companies: City of Hemet; City of Perris; City of San Jacinto; Lake Hemet; McCann Ranch; Nuevo; Rancho California.

It is also unclear whether Eastern's population demands take into account the population growth in these subagencies. Although Eastern says that it did its own independent study of projected population growth, that document is not available for public review in the Eastern UWMP.

MWD's Appendix A.1-8 is in fact only a demand forecast. MWD's demand projections do not seem to be consistent with the demand forecast by Eastern. But since MWD is calculating the demand for the entire region and Eastern is looking only to the demand within its service area (excluding its sub agencies?) it is impossible to compare the two sets of figures. However, MWD does state that "demands in Riverside County are expected to increase at the fastest rate (73 percent between 2005 and 2030) (p. A.1-8).

As indicated by MWD (p. A.2-12) the supply of water from the Colorado River is not dependable.

As to the State Water Project, MWD indicates (p. A.2-13,14) that "there are still significant capacity constraints within the SWP that limit the delivery capability of the full contracted entitlement...the contractors' demands for SWP water currently exceed the dependable yield."

" The amount of entitlement DWR approves for delivery varies annually with contractor demands and projected water supplies from tributary sources to the Delta, based on snowpack in the Sierra Nevada, reservoir storage, operational constraints, and demands of other water users. Historically, the SWP has been able to meet all contractors' requests for entitlement water except during the drought years of 1977, 1990-92 and 1994." (A.2-13)

Endangered species issues are also of concern. "In recent years the listing of several fish species in the Sacramento/San Joaquin Delta (Delta) under both state and federal Endangered Species Acts has constrained SWP operations and created more uncertainty in SWP supply reliability.... In 2005 the abundance of many of the Delta fish has decreased. This issue is currently under investigation." (p. A.2-14)

MWD's Justifications of Supply Projections (Appendix A.3) show many weaknesses. Many of the factors for reduced supplies are only hazily known (global warming; toxic pollution and regulatory constraints related thereto; endangered species and other regulatory constraints. Dramatically increased energy prices caused by the depletion of the earth's oil in relation to rising demand for oil (called "peak oil") are not even mentioned.

"In accordance with its contract with the Department of Water Resources (DWR) Metropolitan has under contract a Table A allocation of 2,001,500 acre-feet per year from the State Water Project. Actual delivers have never reached this amount and depend on availability of supplies as determined by DWR" (p. A.3-13) The SWP is an extremely unreliable source of water to MWD, let alone to EMWD. In addition to global warming and drought, there are serious unsolved and unknown water quality constraints, the levees and canal system is in a state of disrepair and susceptible to complete destruction due to global warming induced rising ocean levels; and the rising costs of energy may make water unaffordable and therefore unavailable to untold numbers of consumers in Eastern's service area.

Each source of supply listed by MWD has similar constraints and is therefore unreliable. Notably, MWD does not even mention the reduced storage capacity of Lake Perris due to the recent partial emptying of the lake pending seismic repairs, which may not be feasible.

Existing and Committed Local Projects (Appendix A.5) do not total the amount of water MWD expects to have available for Eastern and other agencies, some amounts are blank, and the totals for operation and construction are likewise not given. It appears from the body of the report that many of MWD's projects to assure water supply reliability are only in the feasibility study stage.

As to future water supplies to Eastern, in MWD's "2005 RUWMP only existing projects and projects with firm contracts for LRP funding were included. The resulting gap between projected local supplies and IRP targets were assigned to the region as a whole as the remaining IRP Local Resource Program target and not be allocated to particular agencies." (II-7).

"For the purpose of analysis, 'foreseeable hydrologic conditions' is understood to mean under 'historical hydrology' which presently covers the range of historical hydrology spanned from 1922 through 2004" (p. II-7) This analysis completely ignores the long discussion of expected increased drought conditions due to global warming elsewhere in the document.

This analysis also ignores the ability of MWD to receive or deliver "affordable" water when energy costs inevitably rise. If the water is not affordable then it is not "available" to the consumer and cannot be counted as a reliable source of water for purposes of UWMP Act compliance.

"At shortage stage 7 Metropolitan will develop a plan to allocate available supply fairly and efficiently to full-service customers. The allocation plan will be based on the Board-adopted principles for allocation. Metropolitan intends to enforce these allocations using rate surcharges." (p. II-17) First, the board adopted principles for allocation are not included, so that Eastern has no basis for determining what it's allocation under shortage stage 7 conditions might be. Second, Eastern has not determined whether the surcharge for all water above its allotment will make water not affordable to which of its customers; without this analysis, Eastern cannot give any assurances of future water supply in its UWMP.

Although Eastern does not discuss this important topic in any way, MWD has a section on Climate Change which indicates that catastrophic impacts on Eastern's imported and local water supplies are likely and unavoidable. (p. II-21 through II-23)

MWD states that "Global climate models predict that by the end of the century, average winter temperatures could increase by more than 7 degrees Fahrenheit and summer temperatures by as much as 18 degrees Fahrenheit." Precipitation predictions range from a slight increase in precipitation to decreases of up to 30 percent. (II-21) MWD does not, however, indicate the predicted temperature increases and precipitation levels for the next 25 years which they are supposed to be studying in their document. The lack of this information is unconscionable as it gives neither the public or Eastern any idea as to possible decreases or increases in available water caused by global warming. As global warming is a "wild card" which is increasing in geometric terms (described as an avalanche which has already begun and is beyond stopping by some climate scientists), no assurances of water supply to southern California, let alone Eastern's, have any validity.

Potential impacts to MWD's and therefore Eastern's water supply include:

- Reduction of Sierra Nevada snowpack
- Increased intensity and frequency of extreme weather events
- Rising sea levels resulting in
- Increased risk of damage from storms, high-tide events and the erosion of levees
- Potential pumping cutbacks on the State Water Project and Central Valley Project
- Effects on local supplies such as groundwater
- Changes in urban and agricultural demand levels and patterns
- Impacts to human health from water-borne pathogens and water quality degradation
- Declines in ecosystem health and function

- Alterations to power generation and pumping regimes

Ultimately, MWD's only long-term solution is its "hope to see improvements in climate change science and modeling techniques and/or technology that will enable us to make sound policy and practical decisions in the future." (p. II-23)

This hope is what we all hope, but it does not meet the requirements of either MWD or Eastern under the UWMP Act and does not justify "assurances" under SB 610 and 221 for water supplies for future development.

Desalinization and recycling are both unreliable sources of potable water and questionable sources for non-potable water and therefore cannot be relied upon in calculating supply and demand for the next 20 years.

Of all the water quality concerns listed by MWD and Eastern (salinity; perchlorate; organic carbon and bromide; methyl tertiary butyl ether and tertiary butanol; arsenic; radon; uranium; NDMA; chromium IV; pharmaceuticals and personal care products) none have an action plan which clearly shows that they will cease to be a problem immediately and therefore that the water supply in the next 20 years will not be comprised in its quality because of these water quality issues.

For instance, Eastern indicates that perchlorate has been detected in three of its wells. (p. 81) There is no indication of the level of perchlorate or its source. Is this a source/plume which is likely to contaminate more wells? Will the level of contamination increase to the level where it cannot be blended? If so, will Eastern be able to afford the costs of treatment?

None of the above questions, and many others which need to be asked and answered, are addressed by either Eastern or MWD.

Neither Eastern's nor MWD's UWMP is consistent with the State Water Plan and the County of Riverside General Plan Multipurpose Open Space Element. The County, reflecting the information found in the California Water Plan and water budgets produced by the California Department of Finance population projections, show that "demand for water will exceed supply in 2020 whether or not a drought conditions exists at that time." (p.OS-7) Because neither UWMP projects a water supply and demand problem, they have failed to prepare for this problem and are giving false assurances to the County regarding available water supply for future development.

For all of the above reasons, Eastern's UWMP does not comply with the UWMP Act and cannot be used for compliance with SB 610 and 221 of 2001.

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Response to Sue Nash

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

Board of Directors

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Redwine and Sherrill

December 22, 2005

Ms. Susan Nash
PO Box 253
Nuevo, CA 92567

Subject: Urban Water Management Plan for Easter Municipal Water District

Dear Ms. Nash;

Thank you for your interest in EMWD's Urban Water Management Plan. Enclosed is our initial response to your concerns expressed in the letters you sent on December 7 and December 21, 2005 representing the Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society.

In addition to this response, I would like to set a time to meet with you at your earliest convenience to discuss EMWD's water supply and reliability. EMWD believes it would be of mutual benefit to insure that any concerns you have are not the result of any misunderstanding.

Thank you again, for your interest in the Urban Water Management Plan. Planning for water supply in California is a complex and difficult task and the participation of the public is a valuable component. I look forward to clearing up any concerns you may have.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar

December 7, 2005
Susan Nash
PO Box 253
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Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society submit these concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

There was no apparent involvement of diverse social, cultural and economic elements of the population within the service area prior to and during the preparation of the plan. There was one newspaper ad, but we believe the law requires that more than one announcement be placed in the paper as to the time and place of comments and meetings to discuss and adopt the plan.
The public involvement has been detailed in Appendix A along with both dates the public notice was published.

The San Jacinto River Watershed Council (with whom EMWD allegedly cooperated on the recycling plan) was not noticed. Many important documents mentioned were not listed as being in an appendix. Appendix A and D which were mentioned in the text are not in the document. Where are Appendix B and C? Are there any more?

There were two Integrated Regional Water Management Plans mentioned (MWD and Santa Ana) but neither was attached, or even a web page mentioned where one could check them out. Many other documents were mentioned regarding the groundwater management plans and other matters; however, no web page or other information on how the public might read these documents is given.

There is no record of who was contacted and given copies for review or when. Like me, they may not have been told when comments were due and when meetings were to be held, without making phone calls.

The document does not give year by year historical data on how much water has been received from the State Water Project, the Colorado River, from MWD overflow to recharge and from groundwater.

The entire groundwater discussion is extremely difficult to decipher. The management plan for one basin is in a missing appendix, the management plan for the other is simply not there yet, and there is no way to locate all the supporting documents mentioned. Maybe in those documents there is a discussion of the analysis of the groundwater by Dr. Tien C. Lee, University of California, Riverside, CA. It is important that the public know the basis for the groundwater supply projections being made.

The reliability of supply is stated, but not discussed. There is no analysis of how often the supply from MWD has fallen short and by how much. There is no mention (as there was in the California State Water Plan draft) of the impacts of Global Warming causing rising ocean levels and the permanent flooding of the Bay-Delta levees with saltwater; "peak oil" causing rising energy prices and reducing the affordability of potable water; and the complete lack of northern California Water for many months in the event of a major earthquake in northern California.

Water use by customer type is confusing. The plan seems to first indicate farming is going away, and then it says farming use will stay the same. It is not clear which kind of farming is being discussed—citrus? dairy?

As you can see in Figure 6.1 around 1975, the demand for water from EMWD was nearly as high as it is today even though the population is much smaller. This was due to the agricultural demand in the area at the time. The agricultural demand has declined and is only about 4% of the total demand. The agriculture demand remaining is expected to remain relatively consistent. In addition to potable water customers, the recycled water system also serves agricultural customers. Some of these customers need recycled water because potable water would not be economically feasible. This demand is decreasing as land develops. Other agricultural customers invested in crops such as citrus or dairy, can help reserve potable water for other uses by using recycled water instead of groundwater. This switch from potable demand

It appears that EMWD does not really want to encourage conservation because it reduces revenue. This is especially true for the reluctance to use conservation measures in case of a complete shut off, such as an earthquake in the Bay Area. The State Water Plan is quite clear that its goal is to provide AFFORDABLE POTABLE water to all Californians and spends a considerable amount of time discussing the high number of Californians without potable water. Over 47% of the residents of the San Jacinto River Watershed live below the poverty level. Instead of demanding that developers use less water, EMWD provides water for sod farmers in the San Jacinto Valley and does not mind that most of the City of Moreno Valley's landscaping water ends up in the streets.

Although desalinization is said to be a reliable source of water, this is contradicted because of the high cost of disposing of the brine water. The elimination of brine is a speculative technology.

The current and projected supply of wholesale water is missing. The contracts with MWD regarding how much water they can supply from each source could not be found. There is apparently no information regarding how much water MWD has promised in the past and failed to deliver. We could find no indication of what the contracts with MWD look like and how they have been fulfilled in the past. This information would have to include the issues of global warming, peak oil and contamination of water.

Most obviously missing is any chart which shows how much water is going to be needed, given the projected growth by SCAG and EMWD's own experts, and how those figures match up with the amount of water MWD is promising to deliver each year. Even if MWD could actually deliver, we could not find any charts or text indicating how demand and supply for the next 20 years match up.

The water shortage contingency plan does not indicate in detail how water is going to be supplied. For instance, if there is an earthquake in the Bay Area, how long will we be without imported water? How much groundwater will have to be shared among how many people? How long will that last? How will industry be affected? And what will happen to food prices when water to agriculture is cut off?

MWD has emergency storage within the region including Diamond Valley Lake within EMWD's service area. If allocations are necessary, they will be made using the WSDM Plan and principles based on needs at the time. The Water Shortage Contingency Plan requires EMWD customers to reduce water use up to 50% in the case of an emergency.

The recycled water plan does not include the documents mentioned, so it is hard to tell what the status actually is.

The water quality impacts on reliability are without any basis. The documents indicate there are serious problems and task forces, but no details about what the extent of the problems are, how much water supply could be reduced and what is or can be done to solve these problems. (see Friends of the Santa Clara River v. Castaic Lake Water Agency, 2004).

There are a lot of charts, but no text on where EMWD's water is coming from and how. These "assurances" of plenty of water are inconsistent with both the State Water Plan (draft) and the Open Space Water Supply element of the Riverside County General Plan. In which case, there are "assurances" with no reliable basis and which do not meet the requirements of the UWMP Act.

In order for the public to read this document with any understanding and to have any assurance that it complies with the UWMP Act and that it can meet the requirements of Senate Bills 610 and 221, it should be organized according to the "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan (January 18, 2005). The 2005 Urban Water Management Plan "Review for Completeness" Form for DWR Review Staff Use, with all references and page numbers, should be provided to the public. Only in this way can the public have any confidence that EMWD's "rosy" projections of "affordable potable" water for the next twenty years have any basis in fact.

December 19, 2005
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951-928-3698
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Board of Directors
Eastern Municipal Water District
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Perris CA 92572-8300

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After we received a copy of the Metropolitan Water District of Southern California Regional Urban Water Management Plan (2005) and the updated Eastern Municipal Water District Urban Water Management Plan (2055), we still find significant deficiencies in compliance with the Urban Water Management Plan Act in both documents.

Eastern states that it relies on MWD for 80% of its potable water supply. However, an unknown portion of its groundwater supply is based on recharge using surplus MWD water.
Table 2.1.1 splits the groundwater supply of the Hemet/San Jacinto Basin Area into native and recovery of recharged groundwater. Eastern states this surplus will be available for 4 out of 5 years, but gives no basis whatsoever for this assertion. (page 12)
Surplus water will not be available at a consistent rate. The quantities used in the UWMP are [illegible]

Eastern states:
"Based on the information detailed in MWD's RUWMP, EMWD is confident that MWD will provide EMWD with enough non-discounted, non-interrupted water supplies to meet demands through 2030. EMWD's only interruptible supply is discounted agricultural water, which accounts for approximately 4% of the District total supply, and the recharge water used for the San Jacinto Basin. It is anticipated that recharge water may not be available in one out of every five years. If there is a shortage of imported water that cannot be supplemented by local supplies, EMWD will make up the deficiency by implementing the water shortage contingency plan." (p. 35, italics added)

However, EMWD's Water Shortage Contingency Plan states:
"Even under the driest three-year cycle, EMWD supply is anticipated to meet demand. With the groundwater management plans in place, the West San Jacinto area has rising water levels and wells are not anticipated to decrease production, and the Hemet/San Jacinto area will be recharged in years of surplus to prepare or recover from dry years. Since local water supplies are stable and fixed, the small increase in demand during dry years will be met through imported water from MWD. Under the Integrated Resources Plan (IRP) and Water Surplus and

Drought Management Plan (WSDM) water, imported by MWD, will be available to meet 100% of member agencies demands, even during dry periods." (p. 64-65, italics added)

Eastern cannot have their cake and eat it too. They cannot say both that if there is a shortage of imported water, they will rely on the water shortage contingency plan; and at the same time have the water shortage contingency plan state that if there is a shortage of local groundwater, they will rely on imported water. This is certainly one of the most significant faults of the EMWD'S UWMP!

[illegible]

Eastern refers to MWD's regional planning and allocation of water and refers the reader to Appendix A.1 of the RUWMP. (p. 62) However, when one looks to Appendix A.1, there is no assurance from MWD that the projected demands of MWD for water will be met. There is no indication of how much of Eastern's demands for imported water are also committed as a wholesale provider to subagency water departments, districts or companies: City of Hemet; City of Perris; City of San Jacinto; Lake Hemet; McCann Ranch; Nuevo; Rancho California. Appendix A.1 [illegible] MWD's resources demand from the population of the entire region. All member agencies and their subagencies are included in that region.

It is also unclear whether Eastern's population demands take into account the population growth in these subagencies. Although Eastern says that it did its own independent study of projected population growth, that document is not available for public review in the Eastern UWMP. EMWD projected growth for it's entire area and then consulted with subagencies to determine if that growth would be met through EMWD or subagency resources. In the absence of [illegible]

MWD's Appendix A.1-8 is in fact only a demand forecast. MWD's demand projections do not seem to be consistent with the demand forecast by Eastern. But since MWD is calculating the demand for the entire region and Eastern is looking only to the demand within its service area (excluding its sub agencies?) it is impossible to compare the two sets of figures. However, MWD does state that "demands in Riverside County are expected to increase at the fastest rate (73 percent between 2005 and 2030) (p. A.1-8).

[illegible]

As indicated by MWD (p. A.2-12) the supply of water from the Colorado River is not dependable.

[illegible]

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Ultimately, MWD's only long-term solution is its "hope to see improvements in climate change science and modeling techniques and/or technology that will enable us to make sound policy and practical decisions in the future." (p. II-23)

This hope is what we all hope, but it does not meet the requirements of either MWD or Eastern under the UWMP Act and does not justify "assurances" under SB 610 and 221 for water supplies for future development.

As described in Section 1 of the RUWMP, MWD has prepared the RUWMP in compliance with Water Code Sections 10610 through 10656 of the Urban Water Planning Management Act, using the guidance of DWR. EMWD believes that the RUWMP addresses the demand for and the reliability of water supplies as required by the law. Any concerns you have beyond what is [illegible]

Desalinization and recycling are both unreliable sources of potable water and questionable sources for non-potable water and therefore cannot be relied upon in calculating supply and demand for the next 20 years.

EMWD believes that desalinization and water recycling are reliable sources of water supply [illegible]

[illegible]

Of all the water quality concerns listed by MWD and Eastern (salinity; perchlorate; organic carbon and bromide; methyl tertiary butyl ether and tertiary butanol; arsenic; radon; uranium; NDMA; chromium IV; pharmaceuticals and personal care products) none have an action plan which clearly shows that they will cease to be a problem immediately and therefore that the water supply in the next 20 years will not be comprised in its quality because of these water quality issues.

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[illegible]

[illegible] Air Reserve Base. Positive test values range from 5-11 ppb. Regulatory [illegible] characterized a perchlorate plume associated with CBWD wells. These wells [illegible] elevated levels of nitrate and trace levels of dibromochloropropane (DBCP), a [illegible] contaminants likely result from past agricultural use of the surrounding properties. The [illegible] of the wells to [illegible] from the wells is blended with imported water from MWD Mills Filtration Plant under permit by the State Department of Health Services. Treatment is not required, and monitoring indicates no increase in contaminant levels over time.

None of the above questions, and many others which need to be asked and answered, are addressed by either Eastern or MWD.

Neither Eastern's nor MWD's UWMP is consistent with the State Water Plan and the County of Riverside General Plan Multipurpose Open Space Element. The County, reflecting the information found in the California Water Plan and water budgets produced by the California Department of Finance population projections, show that "demand for water will exceed supply in 2020 whether or not a drought conditions exists at that time." (p.OS-7) Because neither UWMP projects a water supply and demand problem, they have failed to prepare for this problem and are giving false assurances to the County regarding available water supply for future development.

For all of the above reasons, Eastern's UWMP does not comply with the UWMP Act and cannot be used for compliance with SB 610 and 221 of 2001.

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Appendix B - Groundwater Management Plan - West San Jacinto Groundwater Basin

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

EASTERN MUNICIPAL WATER DISTRICT

JUNE 8, 1995

ADDENDUM

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN
Draft September 1994

MAY 1995

Eastern Municipal Water District

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN
September 1994 Draft

ADDENDUM - May 1995

(~~Strikeout~~ indicates deletion and
underline indicates insertion.)

Table of Contents

Page iii — Last item under Section 7: ~~TRANSFER~~ **EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE ~~USERS~~ USES FROM GROUNDWATER TO RECLAIMED WATER.**

Section 1 - Executive Summary

Page 1-1 — 1st ¶, 3rd bullet item: • ~~structural adequacy~~ capacity of the delivery system is limited;

Last ¶, last sentence: One such action that could adversely affect EMWD's local water resources is a claim recently filed by a neighboring water district ~~Orange County Water District,~~ which underscored the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

Page 1-3 — 2nd ¶, last line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company ...

Page 1-4 — 2nd ¶, 2nd and 3rd sentences: Water requirements by these subagencies ~~varies~~ vary depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, ~~city~~ City of Perris, ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company and Nuevo Water Company.

Page 1-5 — 2nd ¶: **Local Planning and Regulatory Agencies.** Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation Agency. This agency plans, constructs and operates flood control and water

conservation facilities in Riverside County. The construction of ... significant impact. This agency issues the following permits:

a. Separate Application for Flood Plain Management (County Ordinance No. 458)

b. Encroachment Permits

Same ¶, last section: ~~Riverside County Health Department.~~ County of Riverside Department of Environmental Health. The County of Riverside Department of Environmental Health will review NPDES and solid waste facility permits and compatibility of well construction policies and well abandonment and destruction programs with County Ordinance No. 682. EMWD fully intends to coordinate with the County when development of well construction policies and development of a well abandonment and destruction program are developed as part of Plan implementation. ~~The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.~~

Page 1-6 4th ¶: Groundwater production estimates for 1993 were estimated from annual reports of groundwater production on file at the State Water Resources Control Board and from Southern California Association of Governments (SCAG) ~~SCAG~~ land use.

Page 1-7 1st ¶, add to end of ¶: Non-irrigated, vacant land will accommodate most of the urbanization growth in the area.

Page 1-8 2nd ¶, 12th line: ... such as SWP water~~.~~ and demineralization.

3rd ¶, 1st line: ... water distribution ~~plan~~ system ...

Page 1-9 1st ¶, 5th line: 3,360 acre-ft/yr of potable water.

Page 1-14 3rd ¶, **Ultimate Plan Description.** The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints of this plan. Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 1-15 2nd ¶, **Monitoring of Groundwater Level and Quality**, 3rd sentence: EMWD will measure groundwater levels and quality from select private wells. EMWD's measurements will not interfere with the well owners' use of the wells. EMWD's measurements will be provided to participating well owners free of charge upon request.

3rd ¶, **Development of Well Construction Policies**, last sentence: These policies will be related to water quality and health protection only and will not limit, or suspend, or unreasonably increase the cost of current or future groundwater production by ~~existing groundwater producers~~ private landowners for use within the plan boundary.

Page 1-16 2nd ¶, **Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use**, 1st sentence: The intent of this element is to increase the groundwater yield available for municipal use by either ~~retiring~~ voluntary retirement of agricultural and non-potable demands or by voluntarily substituting reclaimed water for groundwater used for agricultural and other non-potable uses.

Page 1-17 Top of page, 4th bullet item: • Administration and Monitoring of Well Construction, Abandonment and Destruction

Page 1-20 2nd ¶, **Financing the Groundwater Management Plan**: The cost of implementing and operating the West San Jacinto Groundwater Basin management plan ~~should~~ shall be borne by municipal water users in the management area... There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft and groundwater producers choose to participate in the groundwater replenishment program in order to access supplemental water supplies instead of curtailing their own groundwater production or enjoining the groundwater production of others in the affected subbasin. In the event of continued overdraft, an equitable cost sharing plan should be developed to allocate costs among EMWD, other benefitted municipal water suppliers, and participating groundwater producers to correct the overdraft.

Page 1-21 1st ¶, last line: The following tasks will be completed in Phase ~~1~~ 1.

2nd ¶, last 2 sentences under **Phase 2 Refine the Ultimate Groundwater Management Plan**: ... management plan. The complexity and ...

Page 1-22 Last ¶, Schedule and Cost. The cost to complete Phases 1 and 2 is estimated to range between 3 to 5 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2. The cost to implement and operate the Groundwater Management Plan is estimated to be between $50 million and $70 Million. Estimates at this time are very rough and they will be refined when the specific projects are identified and designed.

Section 2 - Introduction

Page 2-1 1st ¶, 3rd bullet item: • ~~structural adequacy~~ capacity of the delivery system is limited;

Last ¶, last sentence: One such action that could adversely affect EMWD's local water resources is a claim recently filed by a neighboring water district ~~Orange County Water District,~~ which underscored the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

Page 2-4 2nd ¶ under **Approach to Development of Groundwater Management Plan**, second sentence: These goals can be modified during the plan development process within the constraints of this plan. These goals will determine the magnitude of the plan, beneficiaries of the plan, and will guide the technical work that shapes the plan. Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 2-5 Mid-page, 3rd bullet item: ... plan goals; ~~and~~

Page 2-6 Last ¶, last line: ~~Dr.~~ Mr. P. Ravishanker.

Section 3 - Existing Water Resources Framework

Page 3-2 2nd ¶, 5th line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company, ...

5th ¶, 1st line: ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company.

Page 3-3 Substitute section titled "**Colorado River Water**" with the following:
MWD has water delivery contracts for Colorado River water with the U.S. Department of the Interior for 1.212 million acre-feet per year (MAF/Y) and an additional 180,000 acre-feet per year (AF/Y) of surplus water. The capacity of MWD's Colorado River Aqueduct is 1,800 cubic feet per second or 1.3 MAF/Y. However, as a result of the 1964 U.S. Supreme Court decree in Arizona v. California, MWD's dependable supply of Colorado River water was reduced to less than 550,000 AF/Y. This reduction in dependable supply occurred with the commencement of Colorado River deliveries by the Central Arizona Project.
MWD has a priority to divert 550,000 AF/Y of California's 4.4 MAF/Y basic apportionment under its water delivery contract with the Secretary of the

Interior. In addition, MWD has entered into agreements with other agencies serving Colorado River Water for agricultural purposes in the California desert to increase its dependable supplies. Water use by holders of present perfected rights (Indian reservations, towns, and other individuals along the Colorado River that predate MWD's rights) is estimated to reduce dependable diversions by about 30,000 AF/Y. Conveyance losses along the Colorado River Aqueduct of 10,000 AF/Y further reduce the amount of Colorado River water received in the coastal plain. MWD's dependable Colorado River supplies are projected to total 626,000 acre-feet upon completion of a cooperative water conservation program with Imperial Irrigation District.

Based on an annual determination, the Secretary of the Interior has allowed MWD in recent years to divert Colorado River water apportioned to, but unused, by Arizona and Nevada. Arizona and Nevada are not expected to use their full apportionments until the years 2036 and 2005, respectively. MWD is pursuing several projects to increase the reliability of its Colorado River supplies.

Page 3-4 Substitute the section titled "**State Project Water**" with the following:

SWP water comes from Northern California, is transported through the Sacramento-San Joaquin Delta, and is delivered to MWD through the California Aqueduct. MWD, one of 29 agencies that have contracted with the State for SWP supplies, holds a contract for entitlement to 2.01 MAF/Y, or nearly half of the total contracted entitlement of 4.23 MAF/Y. Initial SWP facilities completed in the early 1970s have produced yields adequate to meet just over half of the total contracted entitlement on a dependable basis. While it was intended that addition SWP facilities would be constructed to meet contractor demands as they increased, this has not occurred. In addition, constraints placed on SWP operations in the Delta under State and federal Endangered Species acts have reduced available SWP supplies. However, the December 1994 consensus agreement on interim standards for Delta flows and water quality brings more certainty to SWP supply availability during the next three years, and is the foundation for immediate initiation of a process for identifying a long-term solution to water supply and fishery problems in the Delta. In the future, if additional facilities are not completed, availability of water from the SWP is expected to decrease due to increased use of water in Northern California, and increasing allocations of water for environmental needs in the Bay-Delta.

Page 3-9 1st ¶, 3rd line: The proposed regulations are included in Appendix A-2 ~~A-1~~.

Page 3-10 4th ¶, 1st line: A summary of existing and proposed water quality standards is presented in Appendix A-3 ~~A-2~~.

Last ¶, 1st section: **Riverside County Flood Control and Water Conservation Agency.** This agency ... Riverside County. The construction of ... significant impact. This agency issues the following permits:

a. Separate Application for Flood Plain Management (County Ordinance No. 458)

b. Encroachment Permits

Last ¶, last section: ~~Riverside County Health Department.~~ County of Riverside Department of Environmental Health. The County of Riverside Department of Environmental Health will review NPDES and solid waste facility permits and compatibility of well construction policies and well abandonment and destruction programs with County Ordinance No. 682. EMWD fully intends to coordinate with the Department when development of well construction policies and development of a well abandonment and destruction program are developed as part of Plan implementation. ~~The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.~~

Section 4 - Groundwater Resources in the West San Jacinto Basin

Page 4-5 — 1st ¶, insert after 1st sentence: ... on the north. The San Jacinto River flows through this subbasin include tributary flows from Potrero Creek and Laborde Canyon.

2nd ¶, 3rd line: San Jacinto ~~Creek~~ River

Table 4-2 — 10th line of data is a duplicate: ~~0 0 0 0 800 1,200 2,000~~

Page 4-9 — 5th ¶: The total outflow in the basin, from all sources, ranges from a low of zero ~~1,300~~ acre-ft/yr from the Menifee ~~San Jacinto Lower Pressure~~ subbasin, to a high of 4,000 ~~4,600~~ acre-ft/yr for the Lakeview ~~Menifee~~ subbasin. The total outflow for the management area is about 10,200 ~~14,800~~ acre-ft/yr.

Page 4-10 — 3rd ¶, 5th line: San Jacinto ~~Creek~~ River

Page 4-14 — 2nd ¶, 1st sentence: The principle sources of groundwater in this basin are underflow from the San Jacinto Lower Pressure, Perris South I, Perris South II subbasins, storm flow percolation in the San Jacinto River ~~Creek~~ which includes flow from Potrero Creek and Laborde Canyon tributaries, and runoff from the Lakeview Mountains and Bernasconi Hills.

2nd ¶, insert: Most of the groundwater in the basin is sodium chloride in character. Potentially contaminated surface water flows from Potrero Creek and Laborde Canyon may impact groundwater quality in the basin. The Casa Loma fault ...

Page 4-16 1st ¶, last sentence under **Future Groundwater Quality**: ... These estimates, however, are based on a model that:

- has not been calibrated for TDS or nitrate;
- has each subbasin ~~is~~ represented by only one node and thus the resolution of the analysis is crude; and
- has future water supply and wastewater plans ~~that were~~ used in these studies that are not representative of ~~the~~ future plans.

Last ¶, last sentence: The planning tool would consist of groundwater flow and simulation models similar to those models ~~that were~~ developed and ~~that are~~ in current use in other basins. ~~to develop the Chino Basin Water Resources Management Plan (Montgomery Watson & Wildermuth, Mark J., 1992; Montgomery Watson & Wildermuth, Mark J., 1993).~~

Section 5 - Future Water Supply and Wastewater Flows

Page 5-1 1st ¶, Reclamation Plant List: ~~Temescal~~ Temecula Valley

1st ¶, add following last sentence: Non-irrigated, vacant land will accommodate most of the urbanization growth in the area.

Last ¶, 1st line: seasonal discount are~~:~~ to: achieve ...

Page 5-5 2nd ¶, 2nd sentence: ~~All agricultural demands would be satisfied with reclaimed water by the year 2010.~~

Section 6 - Groundwater Management Goals

Page 6-1 3rd ¶, 2nd sentence: Much of the r~~R~~emaining agricultural water demand will be converted to reclaimed water.

Page 6-2 2nd sentence: The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved ~~or equitably replaced~~.

Section 7 - Elements of Groundwater Management Plan

Page 7-2 2nd ¶, 2nd sentence: The monitoring of groundwater quality includes the collection and review of groundwater quality data that can be used to assess current and future trends in groundwater quality, and to evaluate groundwater quality response to groundwater management activities and climate. EMWD's monitoring activities will not interfere with the well owners' use of the wells. EMWD's monitoring data will be provided to participating well owners free of charge upon request.

Page 7-3 Insert new ¶ following 3rd bullet item: EMWD will coordinate with the County of Riverside Department of Environmental Health when development of well construction policies and development of a well abandonment and destruction program are developed as part of the Groundwater Management Plan implementation.

Page 7-8 3rd ¶, last sentence: ... Reclaimed water can be recharged in the San Jacinto Lower Pressure, Menifee and Winchester subbasins by injection. Recharge of reclaimed water will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where reclaimed water recharge interferes with such construction, operation, or use of a well, suitable arrangements will by made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's reclaimed water recharge activities.

Page 7-9 Last bullet item: Water harvesting in the Lakeview subbasin. Storm water captured in ~~EMWD's~~ Mystic Lake ~~project~~ could be ~~captured and~~ conveyed to test recharge basins in the Lakeview subbasin.

1st ¶ under **Recovery of Contaminated Groundwater**: ... Other treatment technologies may be required if water quality conditions change or new types of contamination are discovered.
Recovery of contaminated groundwater will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where groundwater recovery activities interfere with such construction, operation or use of a well, suitable arrangements will be made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's groundwater recovery activities.

Page 7-14 3rd ¶: ... Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.
Conjunctive use activities will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where conjunctive use activities interfere with such construction, operation, or use of a well, suitable arrangements will be made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's conjunctive use activities.

Page 7-15 2nd ¶, **EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE ~~USERS~~ USES FROM GROUNDWATER TO RECLAIMED WATER.** The exchange of agricultural and other non-potable groundwater production to municipal uses can occur through

- Voluntary retirement of agricultural lands, that is, the conversion of agricultural lands to non-agricultural uses; and
- by voluntarily substituting other supplies such as reclaimed water.

Section 8 - Groundwater Management Plan

Page 8-3 4th ¶, 3rd line: ... ~~city~~ City of Perris ...

4th ¶, 4th line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company, ...

2nd ¶, **ULTIMATE PLAN DESCRIPTION**, 1st sentence: The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints of this plan: Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 8-4 2nd ¶, **Monitoring of Groundwater Level and Quality**, beginning with 3rd sentence: EMWD will measure groundwater levels and quality from select private wells. EMWD's measurements will not interfere with the well owners' use of the wells. EMWD's measurements will be provided to participating well owners free of charge upon request.

3rd ¶, 2nd line: ... Riverside County ~~Health Department~~ Department of Environmental Health ...

Last ¶, 2nd line: ... Riverside County ~~Health Department~~ Department of Environmental Health ...

Last ¶, last sentence: These policies will be related to water quality and health protection only and will not limit, or suspend, or unreasonably increase the cost of current or future groundwater production by ~~existing groundwater producers~~ private landowners for use within the plan boundary.

Page 8-5 1st ¶, 5th line: ... Riverside County ~~Health Department~~ Department of Environmental Health ... (Riverside Co. Dept. Environmental Health)

3rd ¶, **Exchange of Agricultural and Other Non-Potable Groundwater Production to Municipal Use**, 1st sentence: The intent of this element is to increase the groundwater yield available for municipal use by either ~~retiring~~ voluntary retirement of agricultural and non-potable demands or by voluntarily substituting reclaimed water for groundwater used for agricultural and other non-potable uses.

Page 8-11/12 2nd ¶ of **Financing the Groundwater Management Plan**: The cost of implementing and operating the West San Jacinto Groundwater Basin management plan ~~should~~ shall be borne by municipal water users in the management area... There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft and groundwater producers choose to participate in the groundwater replenishment program in order to access supplemental water supplies instead of curtailing their own groundwater production or enjoining the groundwater production of others in the affected subbasin. In the event of continued overdraft, an equitable cost sharing plan should be developed to allocate costs among EMWD, other benefitted municipal water suppliers, and participating groundwater producers to correct the overdraft.

Page 8-12 3rd ¶: The benefits and costs associated with the groundwater management plan should be accounted for locally, that is, by subbasin or some other geographic unit, to insure the benefits and costs are equitably distributed among municipal water users and other voluntary participants.

Page 8-15 2nd ¶, 3rd line: Prepare Project Specific Environmental ~~Impact Report~~ Reviews.

3rd ¶: **Task 2-2 Prepare Project Specific Environmental** ~~Impact Reports (EIR)~~ **Reviews**. ~~EIR's will be prepared~~ CEQA reviews will be performed for the implementation of specific groundwater management ~~elements~~ projects that are developed in Phase 1. This Task consists of the following subtasks.

~~Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.~~

Initial Study. CEQA reviews will be done on each project proposed under the Groundwater Management Plan. An Initial Study will be done such that the need for either a Negative Declaration or an EIR can be determined, based on project-specific design parameters and project site characteristics.

Estimate Environmental Impacts and Develop Mitigation Plans. This work ~~will~~ could include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans as needed on a project-specific basis.

Page 8-16 3rd line: Prepare and Distribute ~~Draft EIR(s)~~ CEQA Documents and Notices.

4th line: ~~Conduct Meetings, Public Hearings and Respond to Comments.~~

5th line: ~~Finalize EIR(s).~~

Page 8-19 Last ¶: The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2. The cost to implement and operate the Groundwater Management Plan is estimated to be between $50 million and $70 million. Estimates at this time are very rough and they will be refined when the specific projects are identified and designed.

References

~~Montgomery Watson, Wildermuth, Mark J., "Final Task 4 Memorandum, New Planning Model Implementation Plan", prepared for Santa Anna Watershed Project Authority, May 1992~~

~~Montgomery Watson, Wildermuth Mark J., "Draft task 6 Memorandum, Develop Three Dimensional Groundwater Model, prepared for Santa Anna Watershed Project Authority, November 1993~~

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DRAFT
GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

Prepared for

EASTERN MUNICIPAL WATER DISTRICT

SEPTEMBER 1994

TABLE OF CONTENTS

Section - Description	Page
SECTION 1 EXECUTIVE SUMMARY	1 - 1
SECTION 2 INTRODUCTION	2 - 1
THE NEED FOR GROUNDWATER MANAGEMENT	2 - 1
APPROACH TO DEVELOPMENT OF GROUNDWATER MANAGEMENT PLAN	2 - 2
PURPOSE OF THIS REPORT	2 - 3
ORGANIZATION OF THIS REPORT	2 - 4
ACKNOWLEDGMENTS	2 - 4
SECTION 3 EXISTING WATER RESOURCES MANAGEMENT FRAMEWORK	3 - 1
WATER SUPPLY AND WASTEWATER AGENCIES	3 - 1
Eastern Municipal Water District	3 - 1
Metropolitan Water District of Southern California	3 - 3
REGULATION OF WASTEWATER	3 - 5
Federal Environmental Protection Agency	3 - 5
State Water Resources Control Board	3 - 6
California Regional Water Quality Control Board, Santa Ana Region	3 - 7
California Department of Health Services	3 - 8
REGULATION OF DRINKING WATER	3 - 10
Summary of Water Quality Standards	3 - 10
LOCAL PLANNING AND REGULATORY AGENCIES	3 - 10
SECTION 4 GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN	4 - 1
PHYSICAL FEATURES	4 - 1
The Perris Subbasins	4 - 1
The Menifee Subbasins	4 - 3
The Winchester Subbasin	4 - 3
Lakeview Subbasin	4 - 4
San Jacinto Lower Pressure Subbasin	4 - 5

TABLE OF CONTENTS
(Continued)

Section - Description	Page
GROUNDWATER HYDROLOGY OF THE WEST SAN JACINTO BASIN	4 - 5
Groundwater Levels and Movement	4 - 5
Groundwater Hydrology	4 - 6
GROUNDWATER QUALITY	4 - 10
Perris North Subbasin	4 - 12
Perris South Subbasins	4 - 12
Menifee Subbasins	4 - 13
Lakeview Subbasin	4 - 14
Winchester Subbasin	4 - 15
San Jacinto Lower Pressure Subbasin	4 - 15
FUTURE GROUNDWATER QUALITY	4 - 16
SECTION 5 FUTURE WATER DEMANDS AND WASTEWATER FLOWS	5 - 1
WATER DEMANDS AND SOURCES OF SUPPLY	5 - 1
Projected Demands	5 - 1
Imported Water from Metropolitan	5 - 1
Groundwater	5 - 3
Reclaimed Water	5 - 4
WATER SUPPLY PLAN WITHOUT GROUNDWATER MANAGEMENT PLAN	5 - 5
SECTION 6 GROUNDWATER MANAGEMENT GOALS	6 - 1
SECTION 7 ELEMENTS OF GROUNDWATER MANAGEMENT PLAN	7 - 1
MANAGEMENT POLICY ELEMENTS	7 - 1
Monitoring of Groundwater Production, Groundwater Levels and Groundwater Quality	7 - 1
Administration and Monitoring of Well Construction	7 - 2
Administration of Well Abandonment and Destruction Program	7 - 3
Groundwater Quality Protection	7 - 3

TABLE OF CONTENTS
(Continued)

Section - Description	Page
YIELD ENHANCEMENT ELEMENTS	7 - 4
Artificial Recharge	7 - 4
Recovery of Contaminated Groundwater	7 - 9
CONJUNCTIVE USE	7 - 13
TRANSFER OF AGRICULTURAL AND OTHER NON-POTABLE WATER USERS FROM GROUNDWATER TO RECLAIMED WATER	7 - 15
SECTION 8 GROUNDWATER MANAGEMENT PLAN	8 - 1
CONTENTS OF THE MANAGEMENT PLAN	8 - 1
MANAGEMENT PLAN CRITERIA	8 - 1
ULTIMATE PLAN DESCRIPTION	8 - 3
Establishment of a Groundwater Manager	8 - 3
Monitoring of Groundwater Production	8 - 4
Monitoring of Groundwater Level and Quality	8 - 4
Development of Well Construction Policies	8 - 4
Development of a Well Abandonment and Destruction Program	8 - 4
Monitoring of Well Construction, Abandonment and Destruction	8 - 5
Groundwater Quality Protection	8 - 5
Exchange of Agricultural and Other Non-Potable Groundwater Production to Municipal Use	8 - 5
Maximize Yield Augmentation with Local Resources-Local Runoff and Reclaimed Water	8 - 6
Maximize Conjunctive Use	8 - 7
Groundwater Treatment	8 - 7
Groundwater Management Plan Alternatives	8 - 7
FINANCING THE GROUNDWATER MANAGEMENT PLAN	8 - 11
IMPLEMENTATION OF THE GROUNDWATER MANAGEMENT PLAN	8 - 12
Phase 1 Short Term Implementation	8 - 13
Phase 2 Refine the Ultimate Groundwater Management Plan	8 - 15
Phase 3 Ultimate Groundwater Management Plan Implementation	8 - 17

TABLE OF CONTENTS
(Continued)

Section - Description	Page
MANAGEMENT AND MONITORING	8 - 18
SCHEDULE AND COST	8 - 18

REFERENCES

APPENDIX A

A-1 AB 3030 with AB 1152 Amendments

A-2 Proposed Regulation: Title 22, California Code of Regulations Div. 4. Environmental Health, Chapter 3 Reclamation Criteria

A-3 Drinking Water Standards and Health Advisories Table

APPENDIX B

Table B-1 Availability of Groundwater Quality Data for Wells in the West San Jacinto Area

LIST OF TABLES

Table Number	Description	Follows Page
1 - 1	Availability of Groundwater in the West San Jacinto Basin	1 - 5
1 - 2	Projections of Municipal and Agricultural Demands West San Jacinto Groundwater Basin	1 - 6
1 - 3	Water Supply Plan in the Absence of a Groundwater Management Plan	1 - 9
1 - 4	Comparison of Groundwater Management Plan Alternatives	1 - 18
3 - 1	Beneficial Uses of Surface Waters	3 - 8
3 - 2	Groundwater Beneficial Uses	3 - 8
3 - 3	Surface Water Quality Objectives	3 - 8
3 - 4	Groundwater Quality Objectives	3 - 8
3 - 5	Maximum Allowable TOC After Organics Removal in Reclaimed Water	3 - 9
3 - 6	Key Criteria for Reclaimed Water Recharge Project	3 - 9
4 - 1	Available Pump Test Data Well Characteristics and Aquifer Properties	4 - 2
4 - 2	Hydrologic Components of the West San Jacinto Basins Year 2000 Conditions Per Basin Plan	4 - 7
4 - 3	Historical Groundwater Production	4 - 9
5 - 1	Projections of Municipal and Agricultural Demands West San Jacinto Groundwater Basin	5 - 1
5 - 2	Metropolitan Water Rate Projections	5 - 2
5 - 3	Availability of Groundwater in the West San Jacinto Basin	5 - 3
5 - 4	Projected Reclaimed Water Flows	5 - 4
5 - 5	Water Supply Plan in the Absence of a Groundwater Management Plan	5 - 5
5 - 6	Cost of Water Supply for the West San Jacinto Groundwater Basin Management Area Without a Groundwater Management Plan	5 - 5
7 - 1	Blending Water Requirements to Meet Title 22 Drinking Water Regulations and Waste Discharge Requirements at Reclamation Plants	7 - 9
7 - 2	Considerations for Blending and Demineralization Elements	7 - 11
7 - 3	Menifee Desalter Costs and Metropolitan's Groundwater Recover Program	7 - 12
7 - 4	Considerations for Conjunctive Use Projects	7 - 13

LIST OF TABLES
(continued)

Table Number	Description	Follows Page
8 - 1	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 1 - Agricultural Exchange and Blending	8 - 8
8 - 2	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 2 - Agricultural Exchange and Blending and Demineralization	8 - 8
8 - 3	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 3 - Agricultural Exchange, Blending and 30,000 Acre-Ft. Conjunctive Use	8 - 8
8 - 4	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 4 - Agricultural Exchange, Blending and 58,000 Acre-Ft. Conjunctive Use	8 - 8
8 - 5	Comparison of Groundwater Management Plan Alternatives	8 - 9

LIST OF FIGURES

Figure Number	Description	Follows Page
1 - 1	Location Map	1 - 2
1 - 2	District Boundary Map	1 - 3
1 - 3	Subagencies	1 - 4
1 - 4	Imported Water Facilities	1 - 4
1 - 5	Major Physical Features	1 - 5
1 - 6	Groundwater Subbasins	1 - 5
1 - 7	Water Demand Projections For the West San Jacinto Groundwater Management Area	1 - 6
1 - 8	Cost of Imported Water	1 - 7
2 - 1	Location Map	2 - 1
3 - 1	District Boundary Map	3 - 1
3 - 2	Subagencies	3 - 1
3 - 3	Imported Water Facilities	3 - 3
4 - 1	Major Physical Features	4 - 1
4 - 2	Groundwater Subbasins	4 - 1
4 - 3	Groundwater Elevation Map 1974	4 - 5
4 - 4	Groundwater Elevation Map 1993	4 - 5
4 - 5	Groundwater Elevation Time History for Perris, Lakeview and Menifee Subbasins	4 - 6
4 - 6	Groundwater Elevation Time History for Winchester, and San Jacinto Lower Pressure Subbasins	4 - 6
4 - 7	Average Annual Precipitation in Groundwater Management Area	4 - 7
4 - 8	General TDS Map	4 - 12
4 - 9	TDS, Nitrate, & General Inorganic Chemistry Perris North Subbasin	4 - 12
4 - 10	TDS in Perris North and Perris South Subbasins	4 - 12
4 - 11	Nitrate in Perris North and Perris South Subbasins	4 - 12
4 - 12	Chloride in Perris North and Perris South Subbasins	4 - 12
4 - 13	TDS, Nitrate & General Inorganic Chemistry Perris South and Lakeview Subbasins	4 - 12
4 - 14	TDS, Nitrate & General Inorganic Chemistry Perris South II and Perris South III Subbasins	4 - 12
4 - 15	TDS, Nitrate & General Inorganic Chemistry Menifee I and II Subbasins	4 - 13
4 - 16	TDS in Menifee I, Winchester and Lakeview Subbasins	4 - 14
4 - 17	Nitrate in Menifee I, Winchester and Lakeview Subbasins	4 - 14
4 - 18	Chloride in Menifee I, Winchester and Lakeview Subbasins	4 - 14

LIST OF FIGURES

Figure Number	Description	Follows Page
4 - 19	TDS, Nitrate & General Inorganic Chemistry in Winchester Subbasin	4 - 15
4 - 20	TDS, Nitrate & General Inorganic Chemistry in San Jacinto Lower Pressure Subbasin	4 - 15
5 - 1	Water Demand Projections for the West San Jacinto Groundwater Management Area	5 - 1
5 - 2	TDS Concentration in Imported Water	5 - 2
5 - 3	Projected Cost of Imported Water	5 - 2
5 - 4	Ultimate Reclaimed Water System	5 - 4

SECTION 1

SECTION 1
EXECUTIVE SUMMARY

THE NEED FOR GROUNDWATER MANAGEMENT

EMWD, together with the majority of water purveyors in Southern California, have been heavily relying on imported supplies from Metropolitan Water District of Southern California (Metropolitan). Recently, Metropolitan's ability to supply the ever-growing needs of Southern California has become increasingly unreliable due to the following reasons:

- demand for water is continuing to increase;
- environmental constraints at the point of origin may limit the water available for export;
- structural adequacy of the delivery system is limited;
- climatological uncertainties can limit delivery; and
- inadequate local storage facilities.

EMWD could purchase imported water from Metropolitan to meet these projected municipal demands. Metropolitan's sources, however, are not reliable and will be very expensive in the future. Metropolitan, with its current planning and future projects, will experience shortages in four of five years, with shortages reaching as high as 30 percent. The cost of imported water from Metropolitan is currently (July 1994) $412 per acre-ft for treated water and is projected to reach about $1,100 per acre-ft by 2010. These rising costs and lack of water to meet all of the demands has encouraged some local agencies in Southern California to claim water rights in the service areas of other agencies. One such action that could adversely affect EMWD's local water resources is a claim recently filed by Orange County Water District, which underscores the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

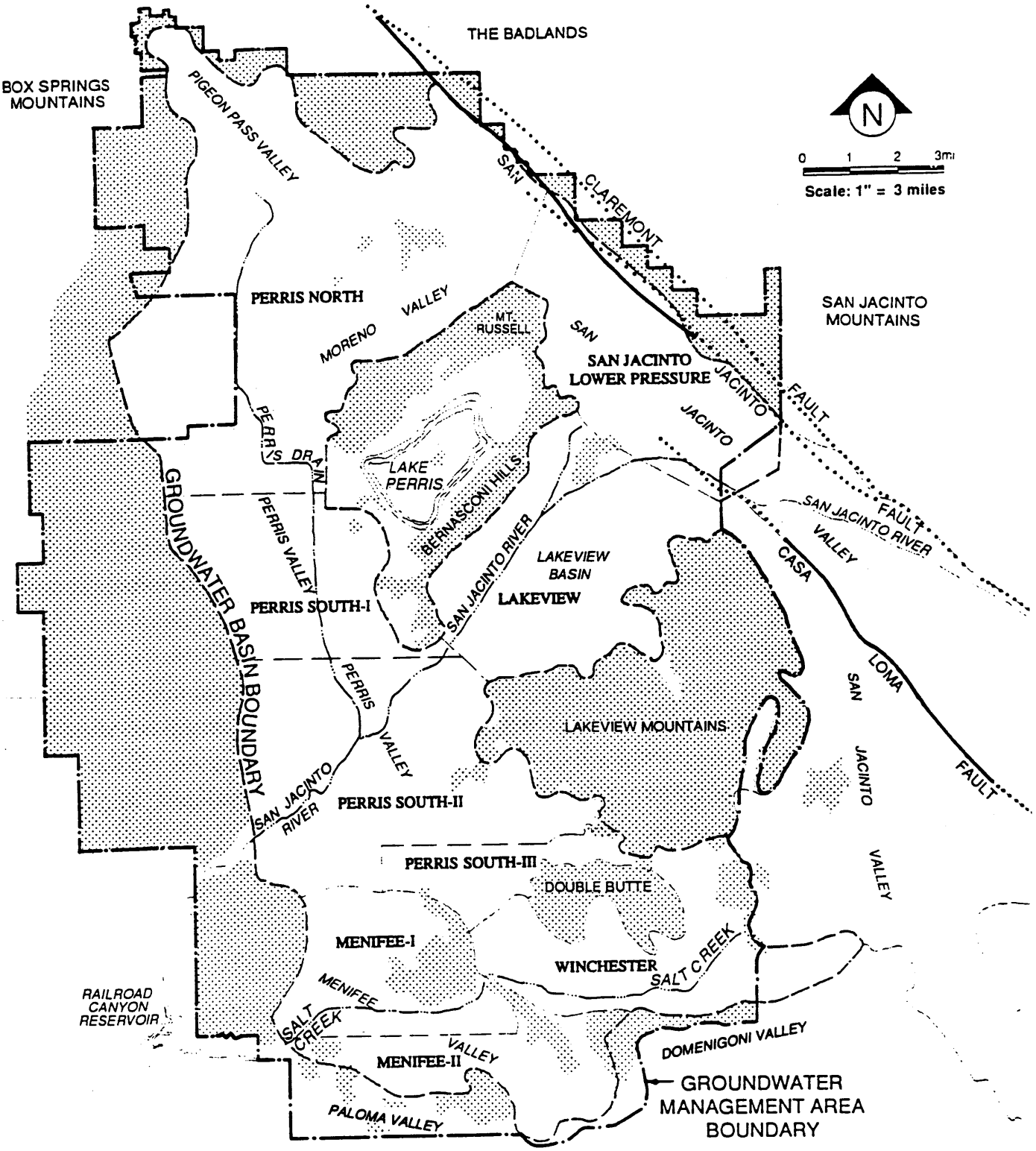
The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins is shown in Figure 1-1. This area is experiencing rapid land use conversion from agriculture to urban uses. Total municipal water demands are expected to increase from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010.

Three sources of water supply for these demands can be considered: groundwater, imported water and reclaimed water. Groundwater in the West San Jacinto Groundwater Basin, for the most part, is of poor quality due to natural causes and irrigated agriculture. Most of the groundwater resources cannot be used as municipal supply due to poor quality - the groundwater quality either violates drinking water standards or is too high in total dissolved solids (TDS) or other water quality constituents to be discharged after municipal use. To meet increasing demands, EMWD could purchase imported water from Metropolitan. However, availability and costs might limit this alternative. EMWD has reclaimed water resources that could be used to meet agricultural demands and non-potable municipal demands. Reclaimed water cannot be directly used for potable demand unless, after groundwater recharge and dilution, it meets Title 22 requirements (State Department of Health Services Reclaimed Water Regulations). Additionally, groundwater treatment practices can convert non-potable water supplies to potable supplies.

The availability and reliability of the total water supply can be improved through the joint, optimized (conjunctive) management of all the water supply sources. It is the intent of Assembly Bill AB 3030, which was incorporated into the Water Code in 1992 (Part 2.75 commencing with Section 10750 of Division 6) with amendments by AB 1152 of 1993, to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions. Authorization to adopt and implement a plan is contained in the following section of AB 3030:

> "§10753 (a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area."

The components of a groundwater management plan may include the following:



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-1
LOCATION MAP

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REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

"§10753.7 (a) The control of saline water intrusion.
(b) Identification and management of wellhead protection areas and recharge areas.
(c) Regulation of the migration of contaminated groundwater.
(d) The administration of a well abandonment and well destruction program.
(e) Mitigation of conditions of overdraft.
(f) Replenishment of groundwater extracted by water producers.
(g) Monitoring of groundwater levels and storage.
(h) Facilitating conjunctive use operations.
(i) Identification of well construction policies.
(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.
(k) The development of relationships with state and federal regulatory agencies.
(l) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination."

EMWD's Board of Directors adopted resolution No. 3039 to develop a Groundwater Management Plan for the West San Jacinto Groundwater Basin and published a Notice of Intent on August 25, 1993. The groundwater management plan for the West San Jacinto Groundwater Basin is being developed under the authority of Assembly Bill 3030 (AB 3030), which allows a local water agency to take the lead in development of a plan. Up to two years can be taken for development of a plan. Local water purveyors, both public and private, have been involved in development of the plan. There are approximately forty-five (45) pumpers in the area. Public meetings, workshops and hearings were held during the preparation of the draft plan. Cooperative agreements with EMWD have already been signed by Nuevo Water Company, Edgemont Gardens Mutual Water District and the City of Perris.

EXISTING WATER RESOURCES FRAMEWORK

Eastern Municipal Water District

EMWD encompasses over 540 square miles in the western portion of Riverside County as shown on Figure 1-2. It is bounded on the west by Western Municipal Water District, on the north by mountains which approximately parallel the San Bernardino County boundary, on the east by the San Jacinto Mountains, and on the south by mountains which parallel the San Diego County line. Only about half of the area within EMWD's boundary receives water service at this time. EMWD is the only wastewater treatment entity in the West San Jacinto groundwater management area.

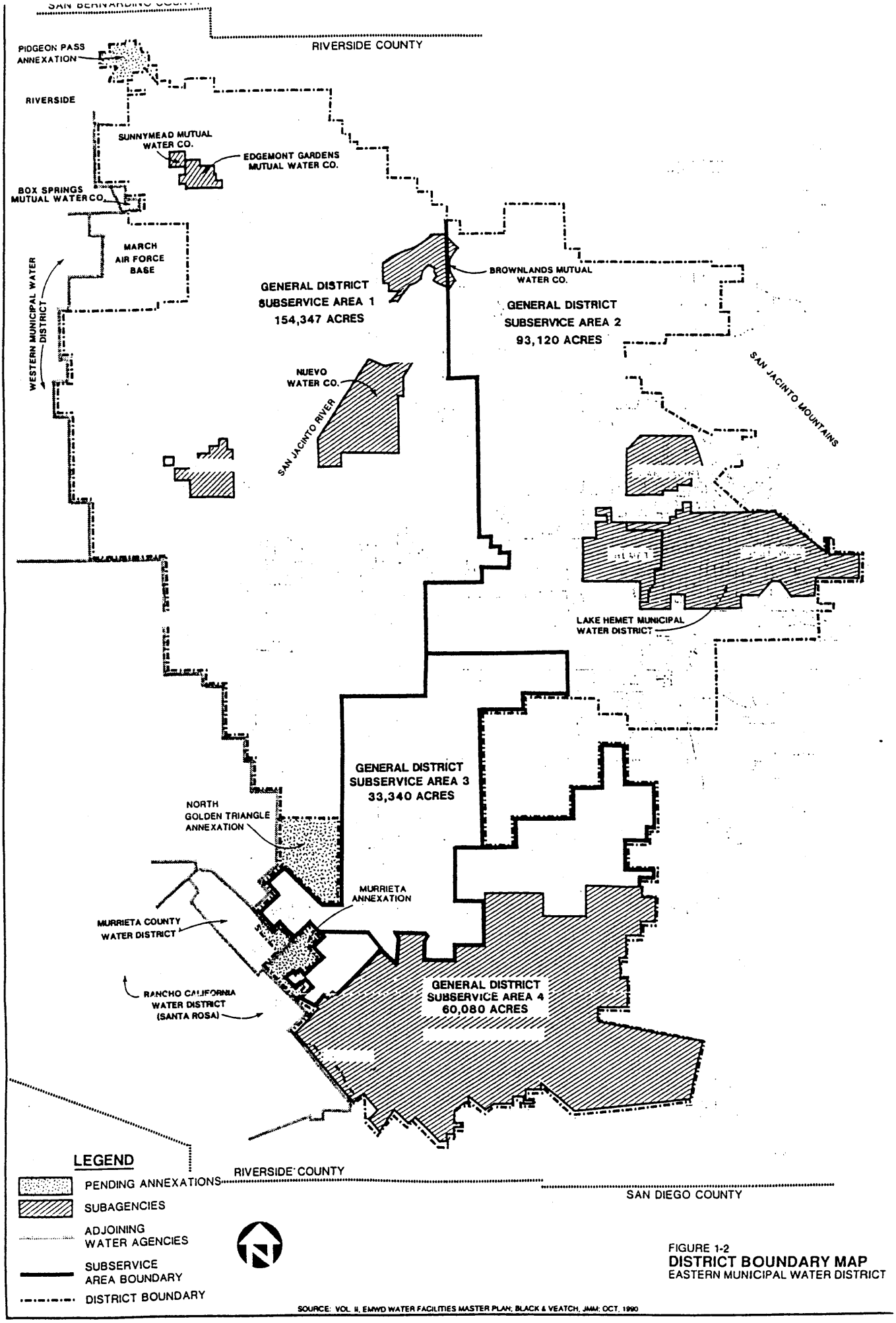


FIGURE 1-2
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

SOURCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT. 1990

EMWD has divided its service area into four subservice areas for the distribution of water as shown on Figure 1-2. The boundary of the groundwater management area is approximately the same as EMWD Service Area 41, which is supplied by Metropolitan's Mills and Skinner treatment plants. The management area includes the cities of Moreno Valley and Perris, and the unincorporated areas in western Riverside County such as the communities of Lakeview, Nuevo, Sun City and Winchester.

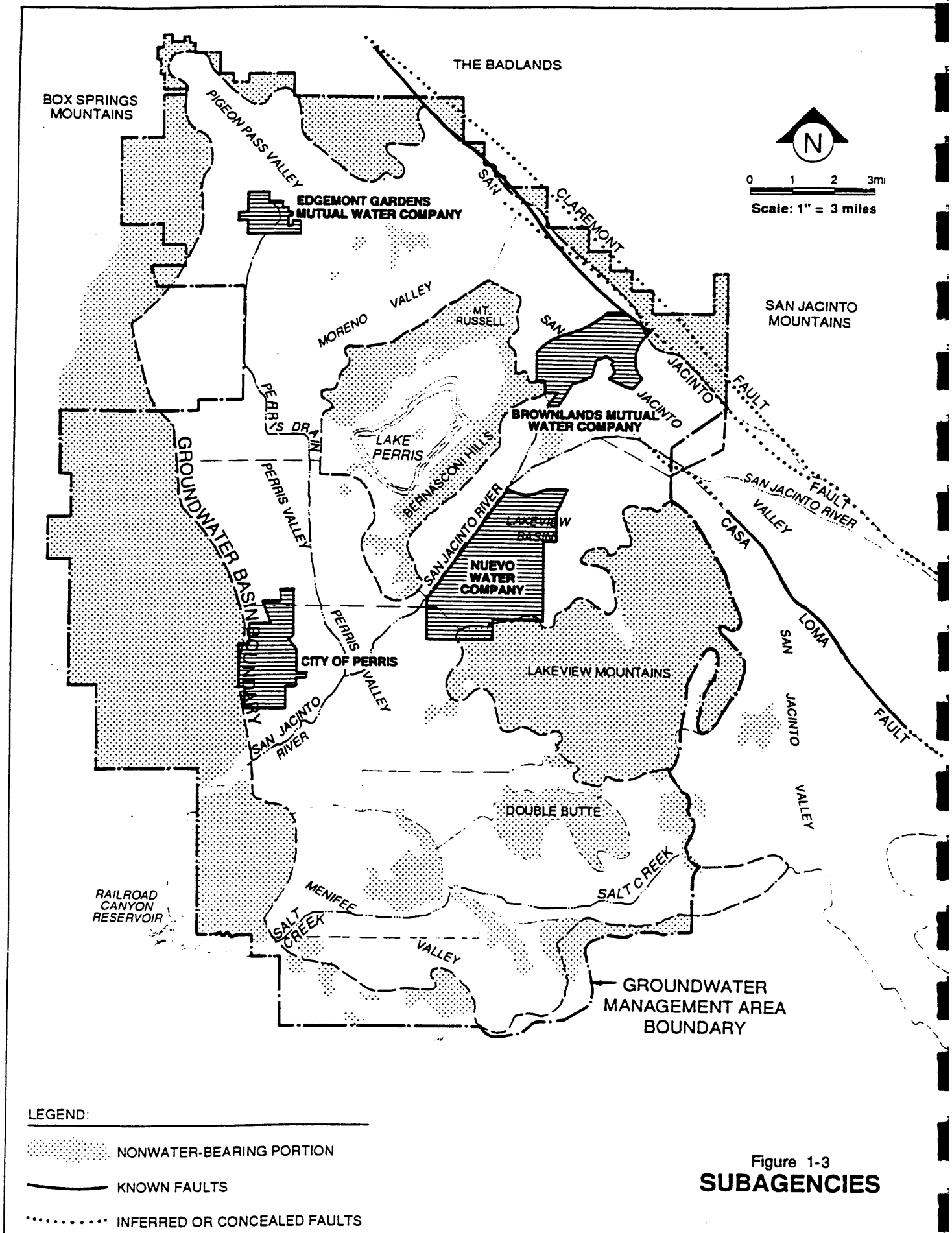
EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city of Perris, Edgemont Gardens Mutual Water Company and Nuevo Water Company. The location of these entities within the West San Jacinto Groundwater Management area are shown in Figure 1-3.

Metropolitan Water District of Southern California

Metropolitan Water District of Southern California (Metropolitan) is a wholesale water agency serving supplemental imported water to 27 member cities and water agencies in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of about 15 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies of the study area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). Figure 1-4 shows the locations of Metropolitan's, state and EMWD imported water facilities.

Regulation of Wastewater

The West San Jacinto Groundwater Management plan will be influenced by the plans and policies of the Federal Environmental Protection Agency, State Water Resources Control Board, California Regional Water Quality Control Board, Santa Ana Region as well as the state and local health departments.



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-3
SUBAGENCIES

REFERENCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT. 1990.

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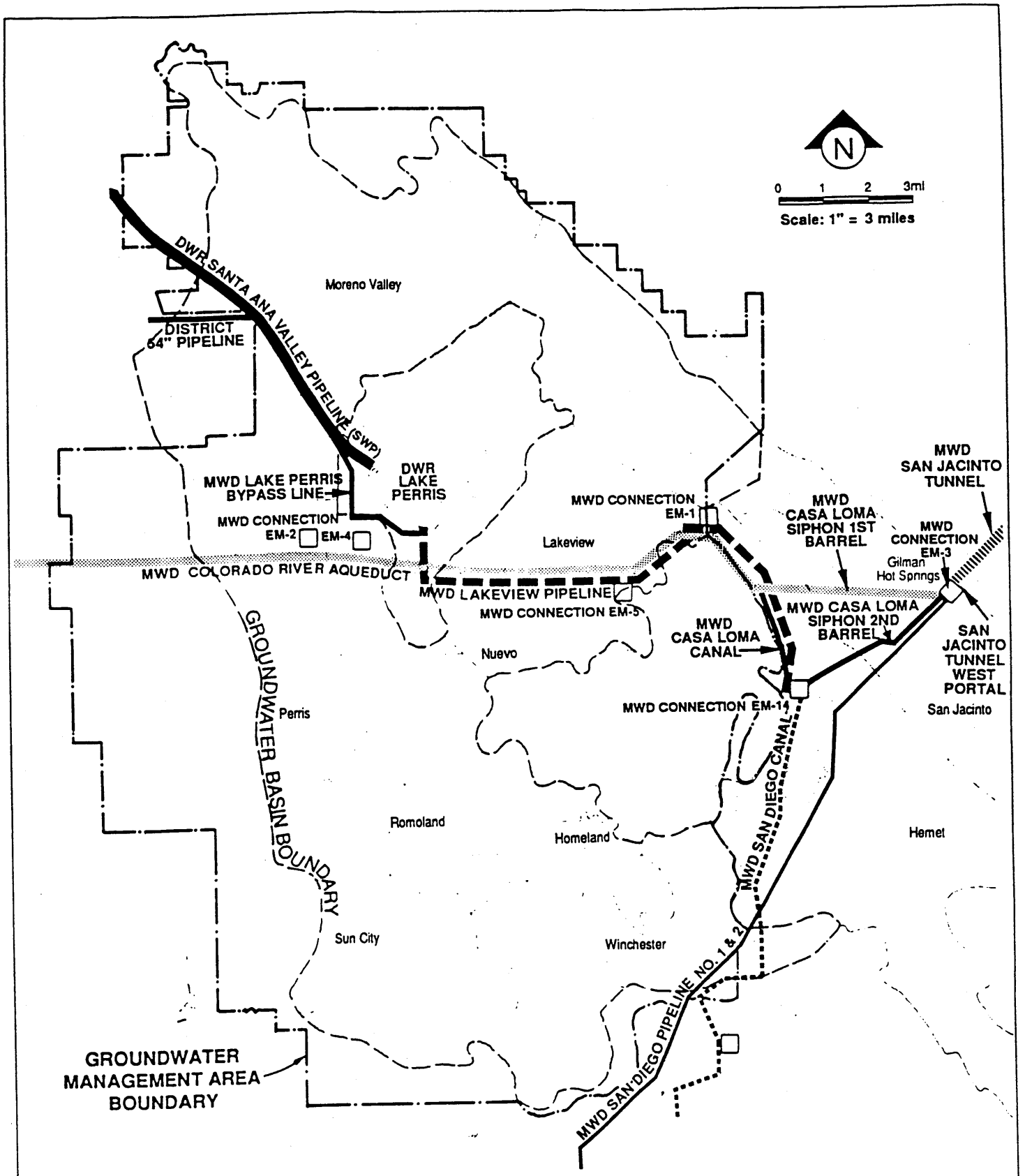

Figure 1-4
IMPORTED WATER FACILITIES

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REFERENCE: EMWD WATER FACILITIES MASTER PLAN, *FIG. 4-3: SOURCES OF SUPPLY MAP*, OCTOBER, 1990.

Regulation of Drinking Water

Drinking water quality standards are enforced in California by California Department of Health Services (DHS). Groundwater developed in the groundwater management plan for municipal uses must satisfy the standards described in Title 22 of California Code of Regulations.

Local Planning and Regulatory Agencies

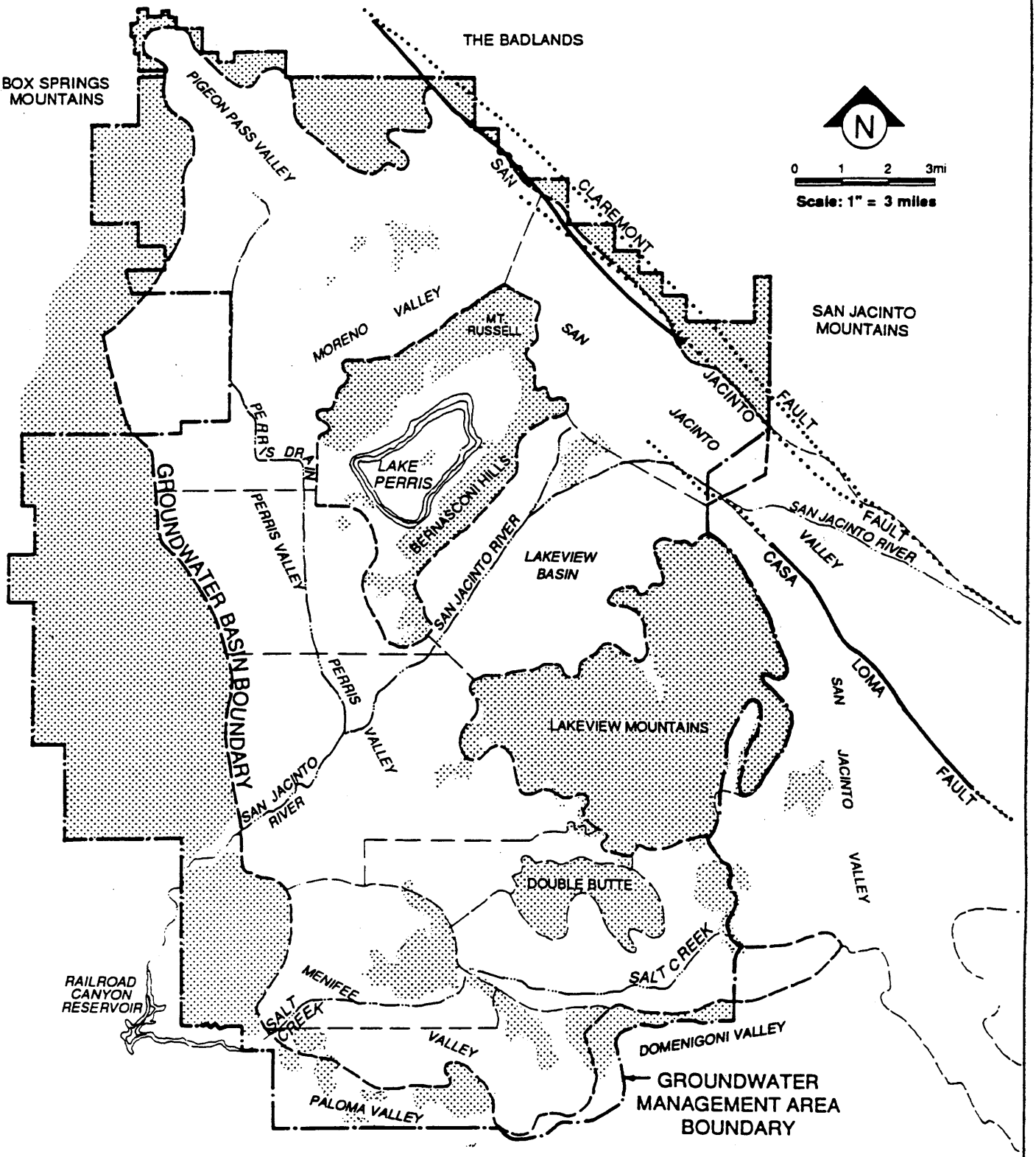
Other local agencies that may have a significant influence on groundwater management include:

> Riverside County Flood Control and Water Conservation District. This agency plans, constructs and operates flood control and water conservation facilities in Riverside County. The construction of flood control and water conservation facilities affects the volume of recharge to groundwater and thus, has a potentially significant impact.
>
> Riverside County Planning Department. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus, this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.
>
> Riverside County Health Department. The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.

GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

Figure 1-5 shows the major physical features, waterbearing and non-waterbearing areas of the groundwater management area. The major physical features in the study area include the San Jacinto mountains, the Badlands, the San Jacinto River, Salt Creek, Perris Valley Drain, the San Jacinto and Casa Loma faults, the Lakeview mountains, the Bernasconi Hills, and Double Butte. The management area groundwater basins are shown in Figure 1-6 and include Perris South I, II and III, Menifee I and II, Lakeview, the San Jacinto Lower-Pressure and portions of Perris North and Winchester subbasins.

The safe yield, volume of groundwater in storage, storage capacity, and water quality characteristics in the subbasins are summarized in Table 1-1. The safe yield of the individual subbasins ranges from about 1,600 for the Winchester subbasin to about 13,700 acre-ft/yr for the Perris North subbasin. The total safe yield of the West San Jacinto Groundwater Basin is about 36,200 acre-ft/yr. The safe yield increases if the volume of other planned groundwater recharge



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-5
MAJOR PHYSICAL FEATURES

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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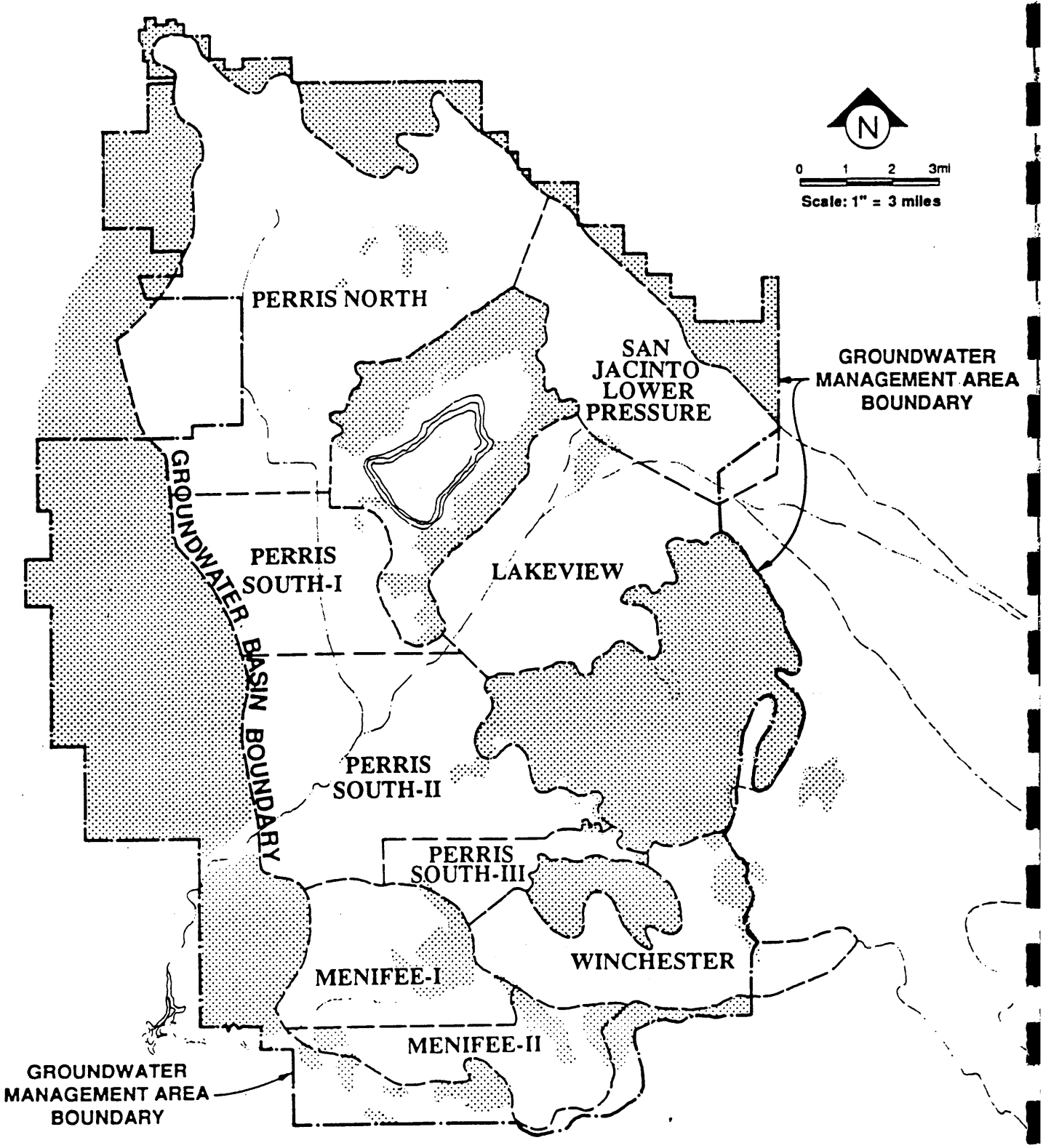

Figure 1-6
GROUNDWATER SUBBASINS

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TABLE 1-1
AVAILABILITY OF GROUNDWATER IN THE WEST SAN JACINTO BASIN

Subbasin	Volume in Storage (acre-ft)	Storage Capacity (acre-ft)	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield (acre-ft/yr)	Safe Yield with Wastewater Recharge (acre-ft/yr)	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration (mg/L)	Average Nitrate Concentration (as Nitrogen) (mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	450	7
Lakeview	283,000	515,000	25%	6,800	6,800	14%	500	3
Perris South	248,000	402,000	22%	8,300	12,800	27%	920	5
San Jacinto Lower Pressure	382,000	391,000	34%	2,500	2,500	5%	1,000	4
Winchester	36,000	41,000	3%	1,600	1,800	4%	2,000	8
Menifee	56,000	101,000	5%	3,300	4,700	10%	2,250	6
Totals	1,128,000	1,797,000	100%	36,200	48,100	100%		
Average							891	5

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water is included in the safe yield estimate. The safe yield, including reclaimed water percolation for the West San Jacinto Groundwater Basin, is about 48,100 acre-ft/yr.

The volume of groundwater in storage ranges from about 36,000 acre-ft for the Winchester subbasin to about 382,000 acre-ft for the San Jacinto Lower Pressure subbasin. The total volume of groundwater in storage in West San Jacinto Groundwater Basin is about 1,128,000 acre-ft. The volume of existing groundwater in storage that can economically be extracted is less than half the current volume in storage. On the other hand, all the water that is added to groundwater storage above the existing levels of groundwater storage can be recovered

Groundwater storage capacity ranges from about 41,000 acre-ft for the Winchester subbasin to about 515,000 acre-ft for the Lakeview subbasin. The total storage capacity for West San Jacinto Groundwater Basin is about 1,797,000 acre-ft.

Groundwater production estimates for 1993 were estimated from annual reports of groundwater production on file at the State Water Resources Control Board and from SCAG land use. Using reported groundwater production data, the total groundwater production from the West San Jacinto Groundwater Basin is about 8,200 acre-ft/yr. Combining reported groundwater production from municipal agencies, groundwater production estimates based on agricultural land uses and deducting agricultural use of reclaimed water yields a basin wide production estimate of about 26,100 acre-ft/yr.

Groundwater quality in most areas renders the groundwater marginal to unacceptable for direct use as a municipal supply. Groundwater from the Lakeview, Perris North, and parts of Perris South I can be used directly for municipal supply. Groundwater from parts of the Perris South I, Perris South II and Perris South III, and San Jacinto Lower Pressure subbasins could be blended with state project water and then used directly. Groundwater from Menifee, parts of Perris South II and Perris III, and the Winchester subbasins will need to be demineralized before use as a municipal supply.

FUTURE WATER DEMANDS AND WASTEWATER FLOWS

Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 1-2 and shown graphically in Figure 1-7. These estimates are based on land use and population projections and projected water use rates. Municipal demands in the West

TABLE 1-2
PROJECTIONS OF MUNICIPAL AND AGRICULTURAL DEMANDS
WEST SAN JACINTO GROUNDWATER BASIN

Year	Municipal Demands(1) (acre-ft/yr)	Agricultural Demands (acre-ft/yr)
1995	47,000	33,000
2000	63,000	32,000
2005	84,000	31,000
2010	112,000	31,000

Sources: (1) EMWD Projections 8/94

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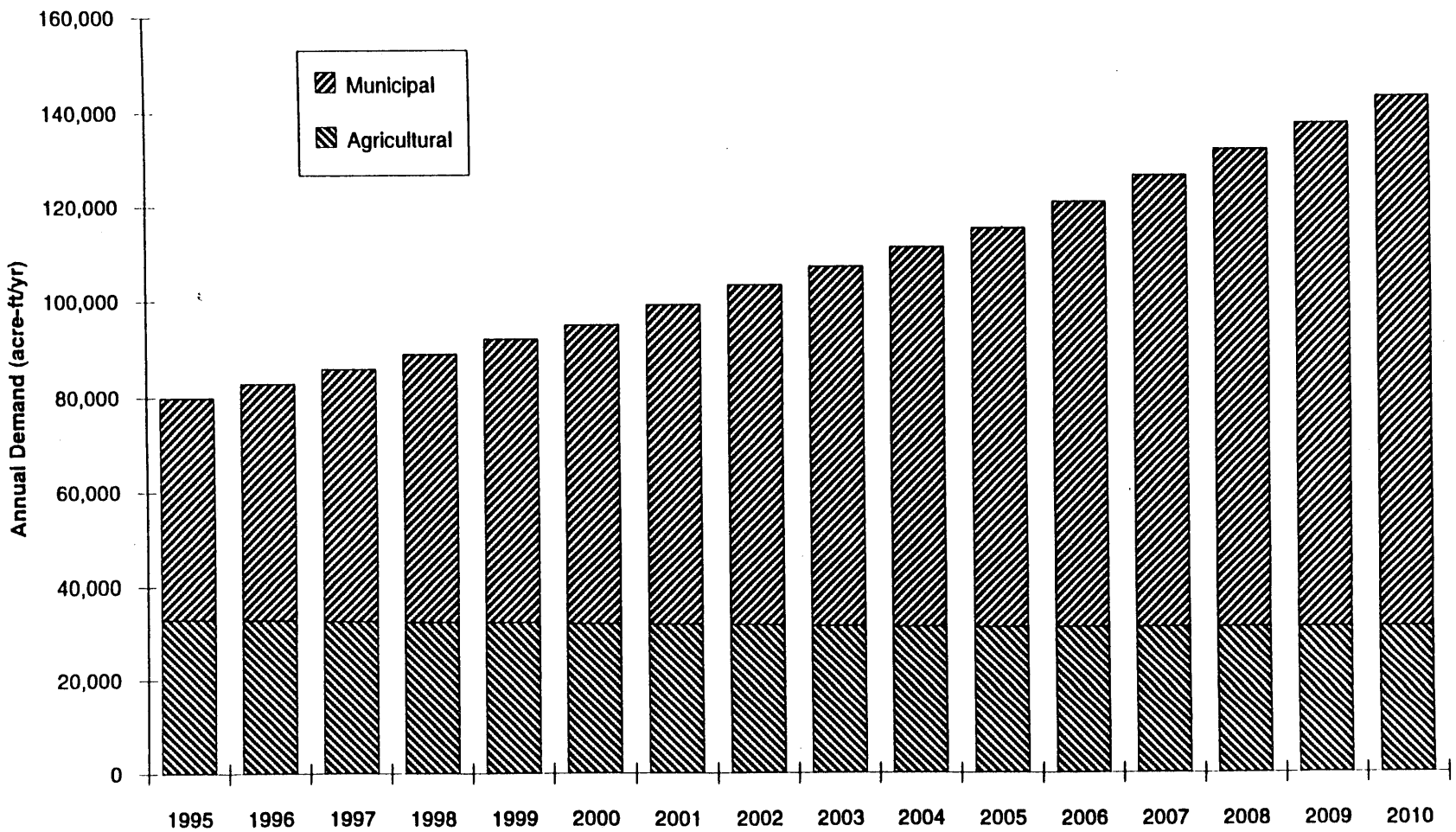
FIGURE 1-7 WATER DEMAND PROJECTIONS FOR THE WEST SAN JACINTO GROUNDWATER MANAGEMENT AREA



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San Jacinto Groundwater Management Area range from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010. Agricultural demands are projected to decline from about 33,200 acre-ft/yr in 1995, to 31,000 acre-ft/yr in 2010.

The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

Imported Water from Metropolitan. The quality of treated imported water is generally excellent and meets all drinking water regulations. Metropolitan adopted a schedule of projected water rate increases in 1991. The water rates established included:

- a base (non-interruptible) rate;
- a treatment surcharge to be added to the base rate for purchases of treated water; and
- a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

The goals of the seasonal discount are: to achieve greater conjunctive use of imported supplies and local supplies; encourage the construction of additional local production facilities; and reduce member agencies' dependence on Metropolitan deliveries during the summer months. Recently, Metropolitan announced water prices for 1993 and forecasted rates for the following ten years. The projected cost of imported water purchased from Metropolitan is shown graphically in Figure 1-8.

Metropolitan is currently evaluating supply reliability for its service area (Metropolitan Water District of Southern California, 1994). Metropolitan is projecting that with year 2000 demands, shortages in retail supplies will occur at least four out of five years, with shortages up to 30 percent. By the year 2020, shortages will occur on average once in five years, with shortages up to 20 percent. The frequency and magnitude of retail shortages will be comparable to Metropolitan shortages for areas that depend heavily on Metropolitan.

Groundwater. Groundwater is available throughout the management area in that most of the management area overlies the West San Jacinto Basin. However, the quality of groundwater precludes the use of some of the management area groundwater for municipal supply. TDS and nitrate are the water quality constituents that limit the use of groundwater. TDS is regulated as a secondary standard. Secondary standards are for those substances that are not hazardous to

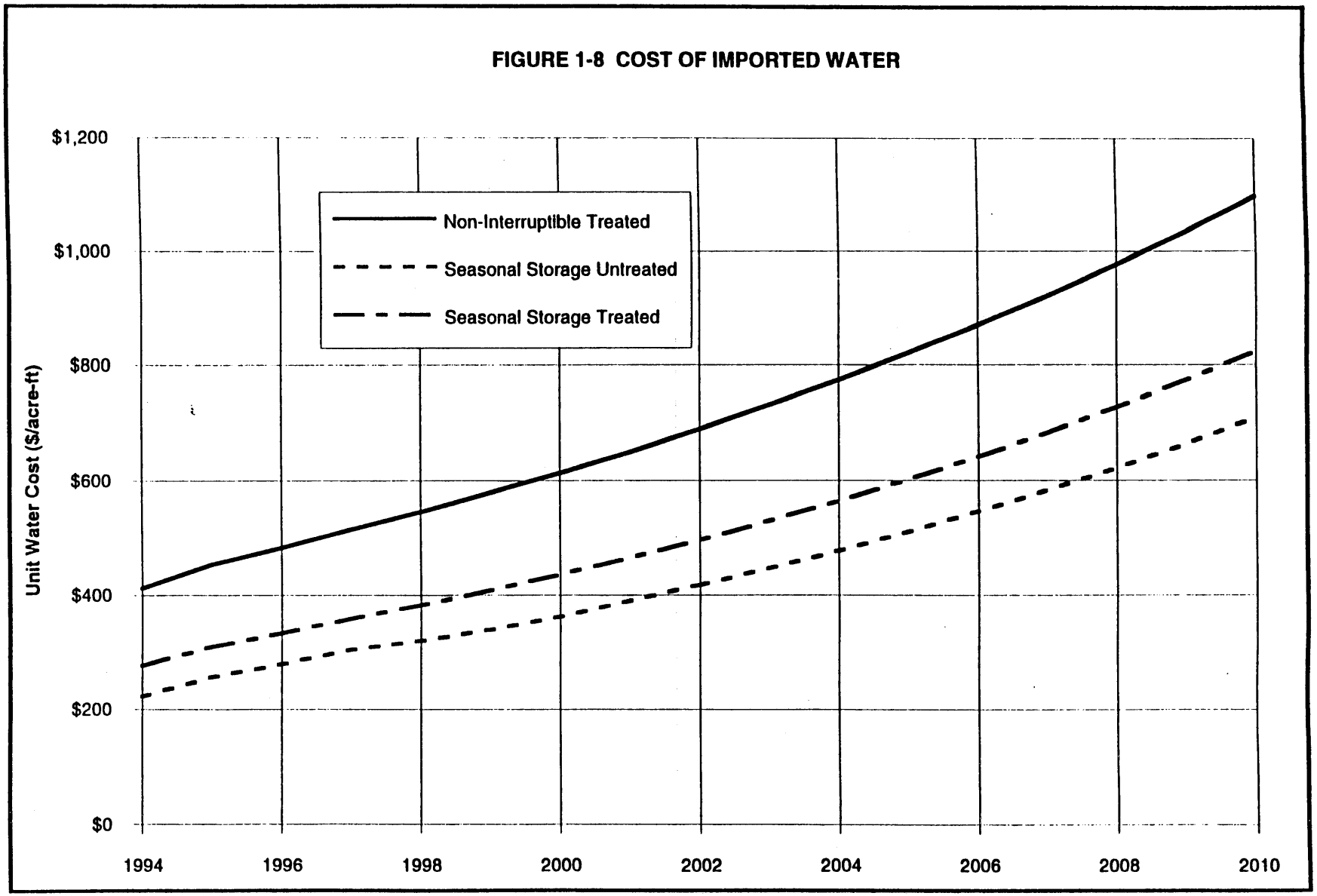
FIGURE 1-8 COST OF IMPORTED WATER
Non-Interruptible Treated
Seasonal Storage Untreated
Seasonal Storage Treated
Unit Water Cost ($/acre-ft)
$1,200
$1,000
$800
$600
$400
$200
$0
1994
1996
1998
2000
2002
2004
2006
2008
2010

health, but may cause taste, order, color, staining or other conditions that adversely affect the aesthetics of drinking water. The maximum contaminant level (MCL) for TDS is expressed as follows:

> *Recommended MCL* - 500 mg/L. TDS concentrations less than or equal to the *Recommended MCL* are desirable for a higher level of consumer acceptance.
>
> *Upper MCL* - 1,000 mg/L. TDS concentrations ranging up to the *Upper MCL* are acceptable if it is neither reasonable nor feasible to provide more suitable waters.
>
> *Short Term MCL* - 1,500 mg/L. TDS concentrations ranging up to the *Short Term MCL* are acceptable only for existing systems on a temporary basis, pending the construction of treatment facilities or the development of acceptable new water sources.

Nitrate is regulated under primary standards. The MCL for nitrate is 10 mg/L (as nitrogen). Table 1-1 lists the average TDS and nitrate concentrations for each groundwater subbasin in the management area. The subbasins are ranked in Table 1-1 from lowest to highest in TDS. From a drinking water perspective, approximately 36 percent of the yield of the West San Jacinto Basin could be developed from the Lakeview and Perris North subbasins for direct use, without additional treatment for TDS and nitrate. Some groundwater in the Perris South-I subbasin could also be used without treatment and San Jacinto Lower Pressure, Perris South-II and Perris South-III groundwater could be used if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II and Perris South-III subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a water supply source are blending with low TDS supplies such as SWP water, and demineralization. The cost to produce groundwater, exclusive of treatment, is estimated at about $68 per acre-ft.

Reclaimed Water. EMWD is constructing a reclaimed water distribution plan that will make reclaimed water available throughout the management area. The reclaimed water system consists of five reclamation plants and about 79 miles of backbone distribution pipelines. The use of reclaimed water replaces non-potable demand on groundwater and imported supplies.

Water Supply Plan without a Groundwater Management Plan

The water supply plan for the management area, in the absence of a groundwater management plan, consists of the use of imported water for all new municipal uses and a combination of groundwater and reclaimed water for agricultural uses. All agricultural demands would be satisfied with groundwater and reclaimed water. The Menifee desalter would be operational in 1997, producing about 3,360 acre-ft/yr. The water supply plan for the management area is listed in Table 1-3.

The cost of this water supply plan is described in Table 5-6 in Section 5 of this report. Table 5-6 shows the annual demand, supplies by source and cost of each source in terms of annual cost, total annual cost and present value of all cost over the 1995 to 2010 planning period. The fractions of total supply and total supply cost by source are listed below.

Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Menifee Desalter	3%	4%
Groundwater	23%	3%

The present value cost of future water supplies in the management area for the period 1995 to 2010 is about $557,000,000.

GROUNDWATER MANAGEMENT GOALS

The mission statement of EMWD is:

> ***The mission of the Eastern Municipal Water District is to deliver a dependable supply of safe, quality water and provide sewage collection services to its customers in an economical, efficient and publicly responsible manner.***

The water supply part of EMWD's mission statement is a goal shared by all purveyors of water in the West San Jacinto Groundwater Basin management area. The safe yield of the West San

TABLE 1-3
WATER SUPPLY PLAN IN THE ABSENCE OF
A GROUNDWATER MANAGEMENT PLAN
(acre-ft/yr)

Year	1995		2000		2005		2010	
	Volume	Fraction	Volume	Fraction	Volume	Fraction	Volume	Fraction
Municipal Demand	47,000	100%	63,000	100%	84,000	100%	112,000	100%
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Menifee Desalter	0	0%	3,360	5%	3,360	4%	3,360	3%
Reclaimed Water	0	0%	1,000	2%	2,000	2%	3,000	3%
Groundwater	2,500	5%	2,500	4%	2,500	3%	2,500	2%
Agricultural Demand	33,000	100%	32,000	100%	31,000	100%	31,000	100%
Reclaimed Water	8,900	27%	8,900	28%	8,900	29%	8,900	29%
Groundwater	24,100	73%	23,100	72%	22,100	71%	22,100	71%
Total Demand	80,000	100%	95,000	100%	115,000	100%	143,000	100%
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Menifee Desalter (1	0	0%	3,360	4%	3,360	3%	3,360	2%
Reclaimed Water	8,900	11%	9,900	10%	10,900	9%	11,900	8%
Groundwater (2)	26,600	33%	25,600	27%	24,600	21%	24,600	17%

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Water Resources Engineer

Jacinto Basin is about 36,200 acre-ft/yr. Projections of groundwater usage in the management area range from about 26,600 acre-ft/yr in 1995, to 24,600 acre-ft/yr in 2010.

Agricultural groundwater use will decrease slightly in the future, from about 24,100 acre-ft/yr to 22,100 acre-ft/yr, as agricultural lands are converted to urban uses. The majority of this agricultural water demand will be satisfied by reclaimed water. The need for potable water will increase dramatically in the future. Potable water demands in the management area will range from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr by 2010.

In the absence of a groundwater management plan, most of the new potable demand will be met from treated imported water purchased from Metropolitan. Metropolitan's supplies are projected to increase in cost about 142 percent over the 1995 to 2010 planning period, from $454 per acre-ft in 1995, to about $1,100 per acre-ft in 2010. Metropolitan's supply is also not entirely reliable. For year 2000 demands, Metropolitan has projected shortages in four years out of five years, ranging from 10 to 30 percent.

There are many private groundwater producers in the management area that do not rely on EMWD for water supply. The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved.

The goal of the groundwater management plan is to

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin Management area</u>.***

ELEMENTS OF A GROUNDWATER MANAGEMENT PLAN

The groundwater management plan consists of four elements that include adoption of groundwater management policies, development of groundwater yield enhancement programs, conjunctive use with imported supplies and the exchange of groundwater from agricultural and other non-potable uses with reclaimed water.

Groundwater Management Policies

Management policy elements consist of developing and implementing policies, regulations and coordinated activities among the groundwater producers. Currently, there is no routine monitoring of groundwater production, groundwater level and groundwater quality in the management area. There are no programs or institutions that routinely collect and review these data. There are no management tools available to forecast the impact of existing and future groundwater management practices. There is no coordination or oversight of well construction in the management area. There is no systematic plan to manage unused and obsolete wells. The management plan needs to include policies to manage well construction and to ensure their destruction when wells become obsolete. The following management policy elements should be included in the groundwater management plan.

- Establishment of Groundwater Basin Manager
- Groundwater Production Monitoring
- Groundwater Level and Quality Monitoring
- Development of Well Construction Policies.
- Development of Well Abandonment and Destruction Policies
- Monitoring of Well Construction, Abandonment and Destruction
- Groundwater Quality Protection

Yield Enhancement Elements

Yield enhancement refers to increasing the useful yield of the groundwater resource. In the West San Jacinto Groundwater Management area there are two yield enhancement elements that could be incorporated in the groundwater management plan -- artificial recharge and recovery of contaminated groundwater.

Artificial recharge can be done in spreading basins, injection wells and exchange. Groundwater storage capacity and favorable hydrogeologic conditions favor artificial recharge in the Lakeview, Perris North and parts of Perris South I and Perris South II subbasins. The other subbasins are full and have poor hydrogeologic characteristics for recharge. The source water

for artificial recharge would consist of small quantities of local runoff and significantly larger quantities of state project water from Metropolitan and reclaimed water from EMWD.

Recovery of contaminated groundwater consists of the pumping and treatment of contaminated groundwater. The types of treatment that are included in this element include demineralization and blending; although other types of treatment may be required depending on water quality conditions. Demineralization will be necessary to remove salt accumulating in groundwater and to develop municipal supplies from parts of the Perris South II and Perris South III, and the Winchester subbasins. Blending could be used to recover degraded groundwater from parts of the Perris South I, Perris South II and Perris South III, and San Jacinto Lower Pressure subbasins. This assessment is based on limited water quality data and therefore the type of treatment necessary to recover contaminated groundwater may change when better data becomes available.

Conjunctive Use

Conjunctive use is an operational strategy that combines the operations of multiple sources of water and storage resources in such a way that the combined yield is greater than the yield that would occur from the sum of independent, uncoordinated operations of the sources. The same definition would apply if other objectives could be achieved by coordinated operation and the yield remained at an acceptable level. Other objectives might include reduced cost, more reliable supply, and the attainment of environmental objectives. In most cases, conjunctive use results in increased yield and lower cost. Conjunctive use is commonly associated with storing of imported water in groundwater basins for use during periods of shortage. The more general definition could involve EMWD reclamation and municipal distribution facilities, Metropolitan facilities and resources, state project facilities and resources, groundwater basins within EMWD, and, potentially, groundwater basins outside of EMWD. Conjunctive use can operate seasonally, over-year, or both. Seasonal conjunctive use would bank water during seasonal period(s) of over-supply or abundance for use during dry times of the year. Over-year conjunctive use would bank water during years of over-supply or abundance for use during drought periods and imported water shortages.

Based on current knowledge of groundwater conditions, EMWD could bank local runoff, imported water purchased from Metropolitan and reclaimed water in the Lakeview, Perris North and Perris South subbasins during the period of October 1 through April 30, for use either during

the summer, during periods of imported water shortages, or both. The unused storage capacity of the Lakeview, Perris North and Perris South subbasins is about 600,000 acre-ft. EMWD could use up to half (and possibly more) of this unused storage capacity for seasonal and over-year storage, thereby reducing the cost of imported water purchases and providing an additional source of water during periods of imported supply shortage. Recharge would be accomplished with a combination of new spreading basins and injection wells. Recovery of recharge will be through existing and new production wells. Reclaimed water could be a source of recharge in a conjunctive use program for augmentation of potable supplies. EMWD should be able to shift about 30,000 to 50,000 acre-ft year of non-interruptible rate purchases to off-peak with conjunctive use projects in the Lakeview, Perris North and Perris South subbasins. The reduction in cost would be much more substantial if a blend of reclaimed water and imported water were recharged during the winter.

Based on current knowledge of groundwater conditions, conjunctive use with imported supplies and local runoff in the San Jacinto Lower Pressure, Menifee and Winchester subbasins appears to be more difficult to implement and of less benefit. Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.

GROUNDWATER MANAGEMENT PLAN

Contents of the Management Plan

The management plan described herein is a program to achieve the management plan goals and includes conceptual descriptions of elements of the plan, and a description of the process to define and implement these elements consistent with the management plan goal. The groundwater management program includes: the development and implementation of policies, engineering investigations, facilities construction and operation, and other management activities. There are significant deficiencies in the knowledge of the groundwater resources of the West San Jacinto Groundwater Basin management area. These deficiencies preclude the definitive descriptions for some of the physical and institutional elements of the groundwater management plan. The groundwater management program includes studies to obtain additional information that is necessary to develop all the institutional and physical elements described in the plan.

The goal of the management plan is:

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin management area***

This goal extends to all groundwater users. Groundwater users that are not dependent on EMWD should benefit from the groundwater management plan. Adverse impacts, if any, from the groundwater plan will be minimized or mitigated. The rights of private groundwater producers will be protected. Groundwater producers who extract 10 acre-ft/yr or less would be exempt from the operation and implementation of the groundwater management plan.

Ultimate Plan Description

The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints. The management plan includes implementation of new policies, institutional arrangements, and physical projects. EMWD will be the agency responsible for implementation of the groundwater management plan. Based on the information developed in this study and presented in the previous sections, the ultimate groundwater management plan should include the following elements.

Establishment of a Groundwater Basin Manager. EMWD will implement the groundwater management plan. EMWD Board of Directors will be the decision-making body responsible for directing the implementation of the groundwater management plan. EMWD staff will serve as the staff to assist the EMWD Board of Directors in implementing the plan.

Upon adoption of the groundwater management plan, EMWD Board of Directors will appoint an Advisory Committee. The Advisory Committee will be composed of seven members, with one member each from city of Moreno Valley, city of Perris, Nuevo Mutual Water Company, Edgemont Gardens Mutual Water Company, and EMWD; and two members representing agricultural producers. The Advisory Committee will study, review and provide comments on all groundwater management plan activities directly to the EMWD Board of Directors.

EMWD staff, will prepare an annual engineering report describing the operation of the management plan for review by the EMWD board of directors, Advisory Committee and groundwater producers. EMWD, in consultation with the Advisory Committee and participating groundwater producers, will develop a coordinated operating strategy on an annual basis, based on the management plan and the findings of the annual report.

Monitoring of Groundwater Production. EMWD, in cooperation with the Advisory Committee, will implement a groundwater production monitoring program. Detailed estimates of the safe yield will be developed during the first year of the program. Groundwater production estimates will be developed by EMWD based on totalizing meters, energy usage and land use. EMWD will produce a groundwater production report and estimates of overdraft (if any). These data will be included in the annual report provided to the management committee. The production monitoring program will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Groundwater Level and Quality. EMWD, in cooperation with the Advisory Committee, will implement a groundwater level and quality monitoring program. Groundwater level and quality data will be collected from well owners. EMWD will measure groundwater levels and quality from select private wells. Groundwater levels and quality data from agencies' wells will be provided to EMWD by the agencies. EMWD will compile these data and develop estimates of the groundwater in storage, change in storage, overdraft and groundwater quality conditions. These data will be included in the annual report provided to the management committee.

Development of Well Construction Policies. EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, will develop well construction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies will be updated continuously based on new regulatory requirements and data. These policies will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Well Construction. EMWD has compiled and digitized most, if not all the well construction information that is available for existing wells. EMWD, in cooperation with other groundwater producers, will collect well construction data for new wells. EMWD will provide comments and suggestions to supplement design criteria that will be required by other agencies, including the Department of Health Services and the Riverside County Health Department.

Development of a Well Abandonment and Destruction Program. EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, should develop well abandonment and destruction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies should be updated continuously based upon new regulatory requirements and data.

Groundwater Quality Protection. EMWD, in cooperation with the Advisory Committee and parties responsible for groundwater quality degradation, should develop cooperative plans to prevent further degradation of groundwater and to integrate the solution of existing water quality problems to maximize the beneficial use of groundwater. The known areas of concern are the high TDS groundwater in the Perris South II (Ski Land area) and Winchester subbasins, and the groundwater contamination associated with March Air Force Base. The existing efforts undertaken by EMWD to rehabilitate the Menifee subbasins (the Menifee desalter project) will be completed independent of the groundwater

management plan. Additional degraded groundwater areas could be discovered through groundwater monitoring.

Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use. The intent of this element is to increase the groundwater yield available for municipal use by either retiring agricultural and non potable demands or by substituting reclaimed water for groundwater used for agricultural and other non-potable uses. Incentives should be developed to encourage the exchange of agricultural groundwater production to municipal use.

Maximize Yield Augmentation with Local Resources - Local Runoff and Reclaimed Water. Yield augmentation through the recharge of runoff (water harvesting) and through the recharge of reclaimed water should be implemented where consistent with water quality objectives and other elements of the groundwater management plan. The Lakeview, Perris North and Perris South subbasins appear to be the most feasible areas for this element.

Maximize Conjunctive Use. Conjunctive use should be implemented in the West San Jacinto Groundwater Basin management area. The unused storage capacity in the West San Jacinto Groundwater Basin management area is about 670,000 acre-ft, with about 600,000 acre-ft or 90 percent in the Lakeview, Perris North and Perris South subbasins. The yield from conjunctive use, exclusive of safe yield, could range from 30,000 to 50,000 acre-ft, or perhaps larger. Conjunctive use will improve overall water supply reliability, groundwater quality, and will lower water supply cost. These benefits will be realized by all groundwater users.

The specifics of recharge, extraction, conveyance and treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate conjunctive use alternatives.

Groundwater Treatment. Groundwater treatment in the form of blending and demineralization should be done in the West San Jacinto Groundwater Basin management area to recover contaminated groundwater for municipal use. The specifics of treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to evaluate groundwater treatment feasibility.

Groundwater Management Plan Alternatives

Four groundwater management alternatives were developed to evaluate the economic benefits to all water users in the groundwater management area from increasingly complex and capital-intensive groundwater management plans. All four of these alternatives include the following management elements:

- ❑ Establishment of a Groundwater Basin Manager
- ❑ Monitoring of Groundwater Production

- Monitoring of Groundwater Level and Quality
- Development of Well Construction Policies
- Development of Well Abandonment and Destruction Policies
- Monitoring of Well Construction, Abandonment and Destruction.
- Groundwater Quality Protection

Alternative 1 - Agricultural Exchange and Blending. Alternative 1 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 17,500 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use.

Alternative 2 - Agricultural Exchange, Blending and Demineralization. Alternative 2 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 21,700 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use. Five thousand three hundred acre-ft/yr of highly mineralized groundwater from the Perris South and Winchester subbasins will be pumped and demineralized to produce about 4,200 acre-ft of drinking water.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use. Alternative 3 includes all the elements of Alternative 2, plus conjunctive use. Conjunctive use will be implemented in the Perris North, Perris South I, Perris South II and Lakeview subbasins. Recharge would occur in spreading basins. Source water is state project water and reclaimed water. Average annual increase in recharge and extraction from conjunctive use will be about 30,000 acre-ft/yr.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use.. Alternative 4 is identical to Alternative 3 except that the conjunctive use element has been expanded to 50,000 acre-ft/yr.

Economic Evaluation of the Groundwater Management Plan Alternatives

Tables 8-1 through 8-4 in Section 8 illustrate the economic benefits that water users in the West San Jacinto Groundwater Basin management area would realize if a groundwater management plan were implemented. Each table lists the projected total demand for water and shows how that demand would be satisfied with each groundwater management plan alternative. For economic evaluation purposes, the plan elements are assumed on line in 1999, that is, all elements would be implemented in five years. Actual implementation could take place over a

longer period of time ranging from five to fifteen years. The groundwater management plan alternatives are compared to the *no groundwater management plan case* in Table 1-4. The difference in costs between the *with management plan* cases and *without management plan* case occurs in years 1999 through 2010.

Alternative 1 - Agricultural Exchange and Blending groundwater management plan case has a present value savings of about $108,000,000 over the no groundwater management plan case. The saving comes from the exchange of up to 17,500 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water.

Alternative 2 - Agricultural Exchange, Blending and Demineralization groundwater management plan is identical to Alternative 1 except that the agricultural exchange of groundwater production to municipal uses has been expanded to about 21,700 acre-ft/yr and municipal groundwater production has been expanded by about 4,200 acre-ft/yr through construction of a demineralization facility. Alternative 2 has a present value savings of about $104,000,000 over the *no groundwater management plan case* and is comparable to the cost of Alternative 1. The cost savings over the *no groundwater management plan case* come from the exchange of up to 21,600 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water. The cost of Alternative 2 is slightly higher than Alternative 1 because the demineralization costs are higher than the cost of imported water prior to 2010. After 2010 demineralization costs will be less than imported water. Alternative 2 would have costs savings greater than Alternative 1 if the economic analysis were extended beyond 2010.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 2 plus the incorporation of 30,000 acre-ft/yr of conjunctive use. The source water for conjunctive use is 20,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the *no management plan case* to 26 percent. The demand for untreated seasonal water has risen to 14 percent. Treated non-interruptible and seasonal untreated imported water make up 40 percent of municipal supplies. Alternative 3 has a present value savings of about $172,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $66,000,000 over Alternatives 1 and 2. About 62 percent of the cost savings comes from the agricultural exchange,

TABLE 1-4 (revised 9/7/94)
COMPARISON OF GROUNDWATER MANAGEMENT PLAN ALTERNATIVES

Alternative	---------- Percentage of Total Supply ----------			----- Size of Groundwater Management Plan Elements -----				Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	Non Interruptible Treated Imported Water	Seasonal Treated Imported Water	Seasonal Untreated Imported Water	Agricultural Exchange (acre-ft/yr)	Blending (acre-ft/yr)	Demineralization (acre-ft/yr)	Conjunctive Use (acre-ft/yr)		
No Groundwater Management Plan	64%	0%	0%	0	0	0	0	$557,000,000	na
1 Agricultural Exchange and Blending	49%	0%	0%	17,510	7,100	0	0	$449,000,000	$108,000,000
2 Agricultural Exchange, Blending and Demineralization	46%	0%	0%	21,690	7,100	4,180	0	$453,000,000	$104,000,000
3 Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use (all recharge through spreading)	26%	0%	14%	21,690	7,100	4,180	30,000	$385,000,000	$172,000,000
4 Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use (80 recharge through spreading, 20 % through injection)	18%	4%	18%	21,690	7,100	4,180	50,000	$371,000,000	$186,000,000

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blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due to conjunctive use.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 3 except that conjunctive use has been expanded from 30,000 to 50,000 acre-ft. The source water for conjunctive use is 40,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the no management plan case to 18 percent. Untreated seasonal water has risen to 18 percent and treated seasonal water to 4 percent. Treated non-interruptible, treated seasonal and seasonal untreated imported water make up 40 percent of municipal supplies. Treated seasonal water would be used for recharge by injection. Alternative 4 has a present value savings of about $186,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $80,000,000 over Alternatives 1 and 2. About 57 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due conjunctive use.

The groundwater management plan development costs and the costs of recharge of basins and blending facilities have not been included in these analyses. These costs could have a present value ranging from $50,000,000 to $70,000,000. The cost savings from implementation of any of these alternatives far exceed the cost of implementation. The projected cost savings from the groundwater management plan illustrated in Tables 8-1 through 8-4 are for the 15-year period of 1999 to 2010 in which the capital-intensive facilities, such as spreading basins, have been in operation (and amortized) for 11 years. If these analyses were extended to the period of time over which capital-intensive facilities were to be financed, say 20 years, the cost saving would be significantly greater.

There are two additional significant benefits from a groundwater management plan. First, imported water for direct use has been reduced by half, which will improve overall water supply reliability. The volumetric impact of water shortages in the imported water supply could be reduced by half. Second, the recharge of state project water into the Lakeview, Perris North and Perris South subbasins will improve the quality of the groundwater in these subbasins.

Financing the Groundwater Management Plan

The primary beneficiaries of the plan are municipal water users in the West San Jacinto Groundwater Basin management area. Private groundwater producers such as farmers, dairy operators and individuals with small domestic wells will either be beneficially impacted or have no impacts. It is the intent of the plan to mitigate all significant adverse groundwater impacts to private groundwater producers. The types of beneficial impacts that private well owners could experience will be stabilized or increased groundwater levels where overdraft is occurring, such as the Lakeview subbasin, and reduced supply cost for those groundwater producers that can use reclaimed water in lieu of groundwater.

The cost of implementing and operating the West San Jacinto Groundwater Basin management plan should be born by municipal water users in the management area. The cost savings experienced by the local private groundwater users should be their incentive to participate in the groundwater management plan. There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft. In the event of overdraft, an equitable cost sharing plan should be developed to correct the overdraft.

Some of the elements of the management plan are capital intensive such as recharge facilities, wells, treatment plants, pipelines, etc. EMWD will need to develop a plan to finance these elements of the groundwater management plan with cost recovery based on the sale of water developed by the plan, or some other method as appropriate. Economic analyses show that the management plan should easily pay for itself.

Implementation of the Groundwater Management Plan

Upon adoption of the groundwater management plan, EMWD will form the Advisory Committee and begin implementation of the policy and physical elements of the management plan. The implementation of the groundwater management plan will occur in a phased process and consist of the following:

Phase 1	Short Term Implementation
Phase 2	Refine the Ultimate Groundwater Management Plan
Phase 3	Ultimate Groundwater Management Plan Implementation

Phase 1 Short Term Implementation. The goals of the short term implementation phase are to: implement those elements of the groundwater management plan that are easy to implement; where existing information is adequate for implementation; and to develop and implement demonstration projects that will provide engineering information necessary for design of management elements in the ultimate plan. The following tasks will be completed in Phase I.

- ❑ Groundwater Resources Evaluation
- ❑ Develop Groundwater Management Policies
- ❑ Construct and Operate Demonstration Projects for Blending, Demineralization and Conjunctive Use
- ❑ Develop Water Resources Planning Model
- ❑ Develop and Evaluate Feasibility Level Plans for physical elements of the Management Plan

Phase 2 Refine the Ultimate Groundwater Management Plan. *Phase 1 Short Term Implementation* will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan The complexity and cost for the tasks listed below are dependent on the management plan elements included in the management plan.

- ❑ Prepare Facility and Operation Plans
- ❑ Prepare Financial Plan
- ❑ Prepare Project Specific Environmental Impact Reports
- ❑ Prepare Engineering Report for a Planned Recharge Project
- ❑ Institutional Planning

Phase 3 Ultimate Groundwater Management Plan Implementation. The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Management and Monitoring

The management and monitoring of the groundwater management plan will occur while the elements of the ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by changing conditions.

Schedule and Cost

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three to four years. Phase 3 could take up to 10 years to complete with some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 5 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 3 to 5 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

SECTION 2

SECTION 2
INTRODUCTION

THE NEED FOR GROUNDWATER MANAGEMENT

EMWD, together with the majority of water purveyors in Southern California, have been heavily relying on imported supplies from Metropolitan Water District of Southern California (Metropolitan). Recently, Metropolitan's ability to supply the ever-growing needs of Southern California has become increasingly unreliable due to the following reasons:

- demand for water is continuing to increase;
- environmental constraints at the point of origin may limit the water available for export;
- structural adequacy of the delivery system is limited;
- climatological uncertainties can limit delivery; and
- inadequate local storage facilities.

EMWD could purchase imported water from Metropolitan to meet these projected municipal demands. Metropolitan's sources, however, are not reliable and will be very expensive in the future. Metropolitan, with its current planning and future projects, will experience shortages in four of five years, with shortages reaching as high as 30 percent. The cost of imported water from Metropolitan is currently (July 1994) $412 per acre-ft for treated water and is projected to reach about $1,100 per acre-ft by 2010. These rising costs and lack of water to meet all of the demands has encouraged some local agencies in Southern California to claim water rights in the service areas of other agencies. One such action that could adversely affect EMWD's local water resources is a claim recently filed by Orange County Water District, which underscores the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins is shown in Figure 2-1. This area is experiencing rapid land use conversion from agriculture to urban uses. Total municipal water demands are expected to increase from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010.

Three sources of water supply for these demands can be considered: groundwater, imported water and reclaimed water. Groundwater in the West San Jacinto Groundwater Basin, for the most part, is of poor quality due to natural causes and irrigated agriculture. Most of the groundwater resources cannot be used as municipal supply due to poor quality - the groundwater quality either violates drinking water standards or is too high in total dissolved solids (TDS) or other water quality constituents to be discharged after municipal use. To meet increasing demands, EMWD could purchase imported water from Metropolitan. However, availability and costs might limit this alternative. EMWD has reclaimed water resources that could be used to meet agricultural demands and non-potable municipal demands. Reclaimed water cannot be directly used for potable demand unless, after groundwater recharge and dilution, it meets Title 22 requirements (State Department of Health Services Reclaimed Water Regulations). Additionally, groundwater treatment practices can convert non-potable water supplies to potable supplies.

The availability and reliability of the total water supply can be improved through the joint, optimized (conjunctive) management of all the water supply sources. It is the intent of Assembly Bill AB 3030, which was incorporated into the Water Code in 1992 (Part 2.75 commencing with Section 10750 of Division 6) with amendments by AB 1152 of 1993, to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions. Authorization to adopt and implement a plan is contained in the following section of AB 3030:

> "§10753 (a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area."

The components of a groundwater management plan may include the following:

> "§10753.7 (a) The control of saline water intrusion.
> (b) Identification and management of wellhead protection areas and recharge areas.
> (c) Regulation of the migration of contaminated groundwater.
> (d) The administration of a well abandonment and well destruction program.
> (e) Mitigation of conditions of overdraft.
> (f) Replenishment of groundwater extracted by water producers.
> (g) Monitoring of groundwater levels and storage.
> (h) Facilitating conjunctive use operations.
> (i) Identification of well construction policies.
> (j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.
> (k) The development of relationships with state and federal regulatory agencies.
> (l) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination."

EMWD's Board of Directors adopted resolution No. 3039 to develop a Groundwater Management Plan for the West San Jacinto Groundwater Basin and published a Notice of Intent on August 25, 1993. The groundwater management plan for the West San Jacinto Groundwater Basin is being developed under the authority of Assembly Bill 3030 (AB 3030), which allows a local water agency to take the lead in development of a plan. Up to two years can be taken for development of a plan. Local water purveyors, both public and private, have been involved in development of the plan. There are approximately forty-five (45) pumpers in the area. Public meetings, workshops and hearings were held during the preparation of the draft plan. Cooperative agreements with EMWD have already been signed by Nuevo Water Company, Edgemont Gardens Mutual Water District and the City of Perris.

APPROACH TO DEVELOPMENT OF GROUNDWATER MANAGEMENT PLAN

EMWD's approach to developing a groundwater management plan consists of the following elements:

- Establishing a clear set of management goals;
- Resolving major uncertainties in the knowledge of the groundwater resources;
- Integration of the planning activities and goals of all interested entities;
- Evaluation of the benefits, costs and impacts to interested entities; and
- Providing an environment that obtains consensus at key decision points in the plan development.

A set of management goals must be established early in the plan development process. These goals can be modified during the plan development process. These goals will determine the magnitude of the plan, beneficiaries of the plan, and will guide the technical work that shapes the plan.

There are many uncertainties regarding hydrogeology, hydrology and water quality of the West San Jacinto Groundwater Basin (management area). The entities having an interest in the groundwater management plan have different interpretations of the management area groundwater resources and management issues affecting these resources. Therefore, one of the first steps in the planning process is to develop a complete description of groundwater resources that is understood and accepted by the entities having an interest in the plan.

The water development and wastewater management activities of the entities having an interest in the management area <u>must</u> be integrated into the groundwater management plan. This does not mean that these activities will be included in the plan; rather, these activities will be accommodated in the plan. The plan development process must identify and describe all relevant water development and wastewater planning activities in the management area.

The benefits, costs and other impacts must be evaluated for entities having an interest in the management area. Equity among these entities must be incorporated into the plan in order for the plan to be accepted and implemented. Therefore, the plan development process must include steps to identify and evaluate the benefits, costs and other impacts to the interested entities.

The plan development process will succeed only if there is consensus among the interested entities. Therefore, the process must provide an environment conducive to consensus. The first step to gaining consensus is to invite all the potentially interested entities in the management area to participate in the plan development process. Workshops and meetings were held to inform interested parties during the plan development process. EMWD took the leadership role in the plan development and in disseminating information regarding the plan to all interested parties.

PURPOSE OF THIS REPORT

The purpose of this report is to:

- document what is known about the groundwater resources and water supply needs;
- develop management goals;
- describe the elements of a groundwater management plan consistent with plan goals; and
- describe the management plan; and
- describe what additional information will be required to develop and implement the groundwater management plan.

This report describes the types of groundwater management practices that are being used in other groundwater basins and their applicability to the West San Jacinto Groundwater Basin. The types of information necessary to implement these groundwater management elements are also described. This report presents groundwater management practices in the context of the future water demands and the water resources of the management area. Finally, this report describes a groundwater management plan for the West San Jacinto Groundwater Basin and a program to implement the management plan.

Implementation of the groundwater management plan will occur over the next 20 to 40 years. As mentioned above, information describing the groundwater basins is inadequate to definitively describe the groundwater management plan. New information will need to be developed during plan implementation. Over the course of the next 20 to 40 years, new technologies, water quality standards and operating concepts will be developed. Therefore the management plan must have

alternatives to achieve the management plan goals and be flexible to accommodate future changes.

ORGANIZATION OF THIS REPORT

This report consists of eight sections and two appendices. The remaining seven sections of this report are:

Section 1 Executive Summary

Section 3 Existing Water Resources Management Framework

Section 4 Groundwater Resources in the West San Jacinto Basin

Section 5 Future Water Demands and Wastewater Flows

Section 6 Groundwater Management Goals

Section 7 Elements of the Groundwater Management Plan

Section 8 Description of the Groundwater Management Plan

ACKNOWLEDGMENTS

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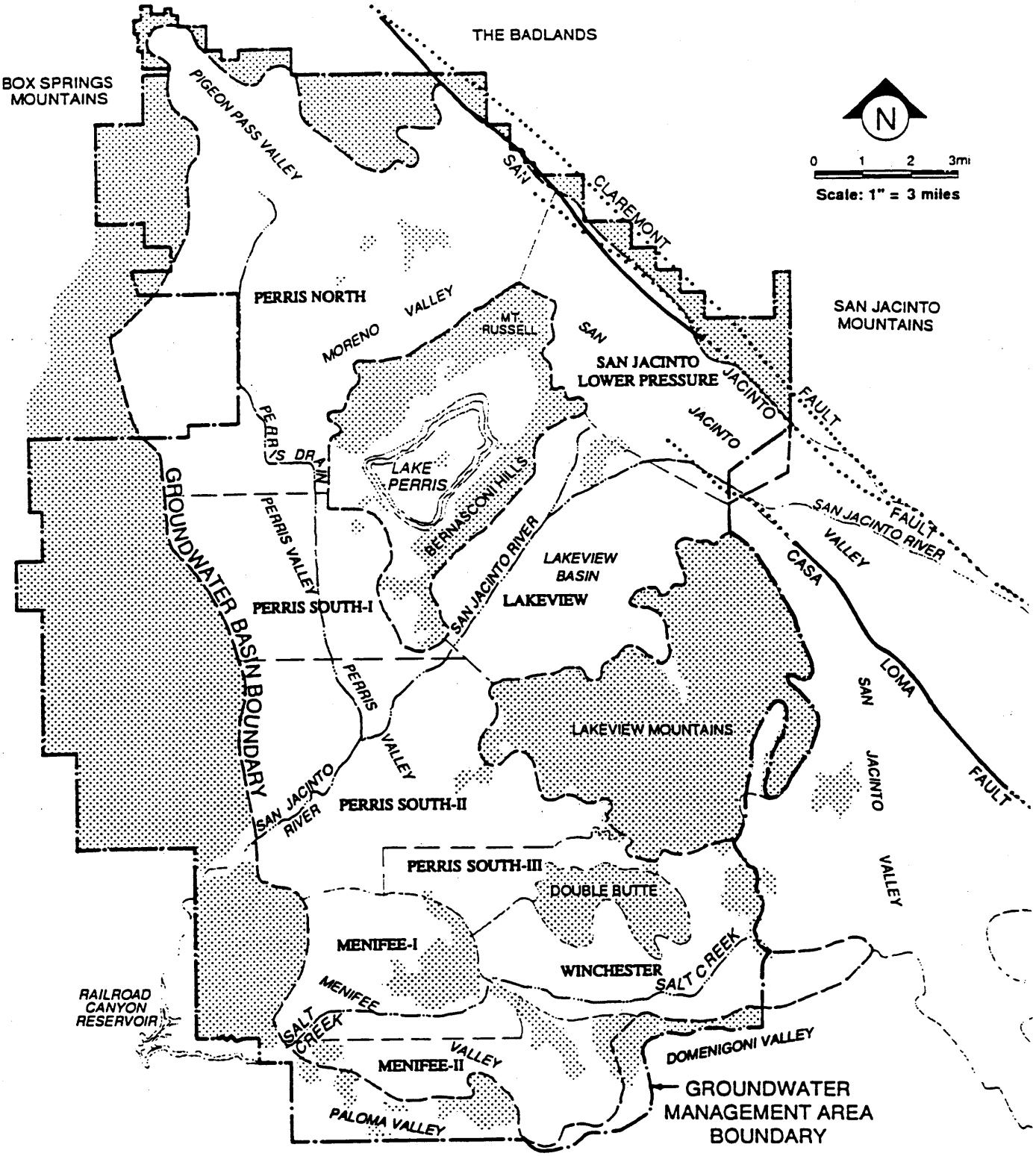

LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 2-1
LOCATION MAP

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REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

SECTION 3

SECTION 3
EXISTING WATER RESOURCES FRAMEWORK

This section describes the existing institutional and regulatory framework for the groundwater management plan. First, the agencies that sell, import and otherwise provide water for the management area are listed and described. The regulatory constraints for the management of wastewater and drinking water are also described.

WATER SUPPLY AND WASTEWATER AGENCIES

Eastern Municipal Water District

EMWD encompasses over 540 square miles in the western portion of Riverside County as shown on Figure 3-1. It is bounded on the west by Western Municipal Water District, on the north by mountains which approximately parallel the San Bernardino County boundary, on the east by the San Jacinto Mountains, and on the south by mountains which parallel the San Diego County line. Only about half of the area within EMWD's boundary receives water service at this time. Other areas will receive service by EMWD as they develop. EMWD is the only wastewater treatment entity in the West San Jacinto groundwater management area. EMWD's sphere of influence extends easterly to the San Jacinto and Santa Margarita watershed boundaries.

EMWD has divided its service area into four subservice areas for the distribution of water as shown on Figure 3-2. The divisions are based on location, local water resources, existing water deliveries, and proximity to sources of imported water. Water can be transferred from one subservice area to another. Each subservice area encompasses a specific section of EMWD. Service Area 41, which is mainly supplied by MWD's Mills Filtration Plant, includes Moreno Valley, Perris and the community of Sun City. The area including the cities of Hemet and San Jacinto and unincorporated Winchester is supplied mainly by well water and is in Subservice Area 42. Subservice Area 43 encompasses the Antelope-French-Domenigoni Valley and the

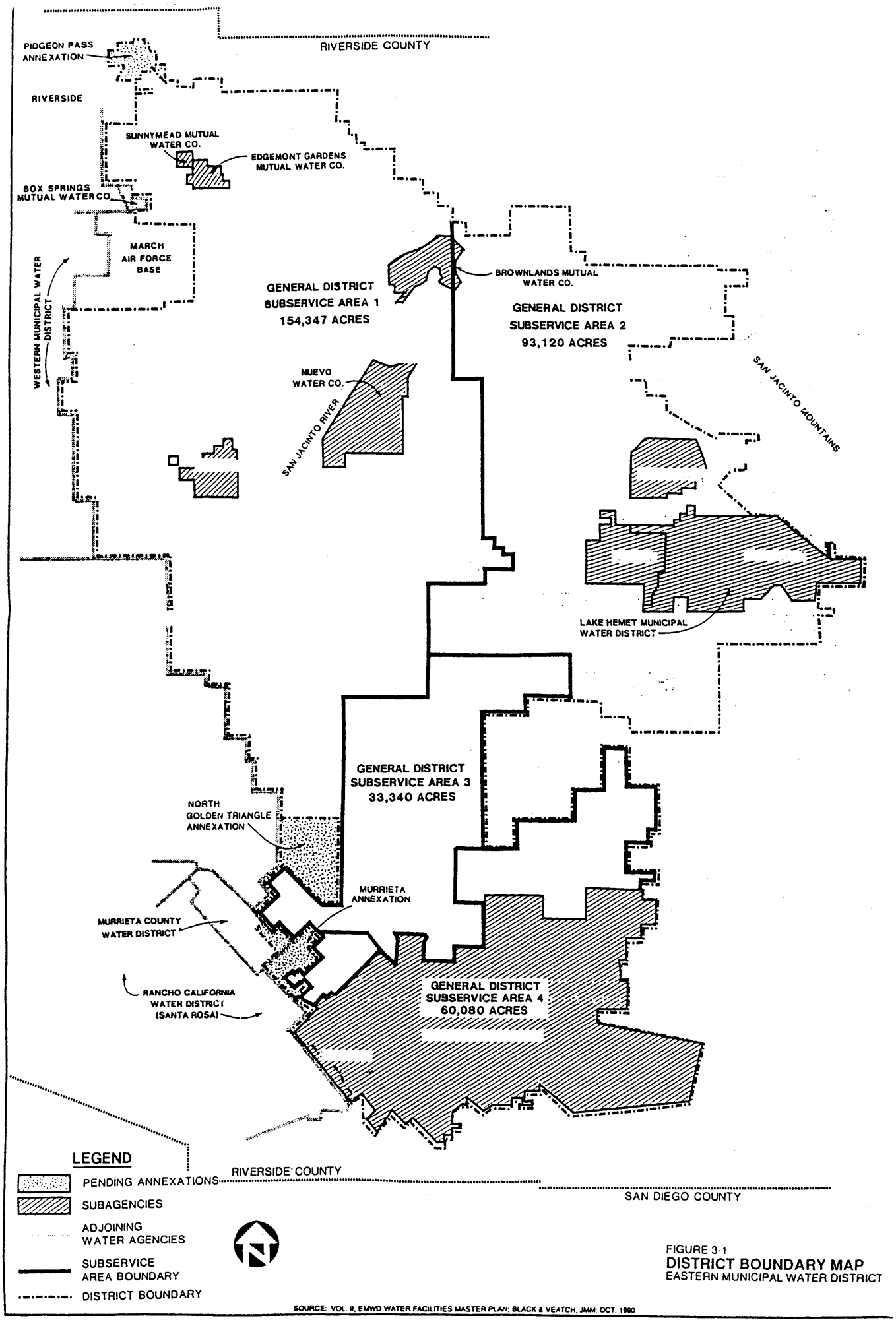
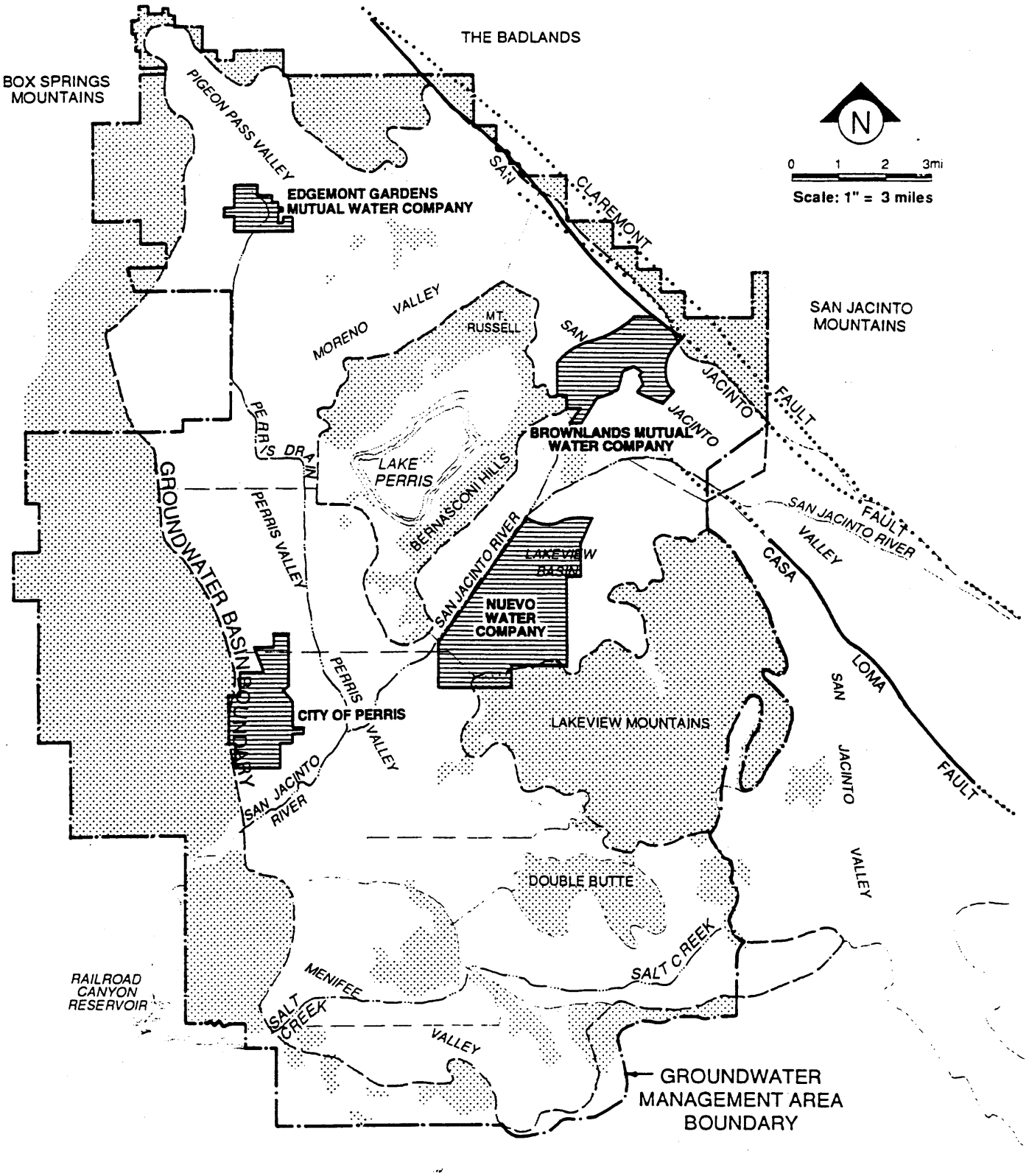


FIGURE 3-1
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

SOURCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT. 1990



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 3-2
SUBAGENCIES

REFERENCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT, 1990.

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Murrieta Hot Springs Region of EMWD. The Golden Triangle and Dutch Village developments are also located in this subservice area and will eventually receive almost their entire supply from MWD's Skinner Filtration Plant. At the extreme southern end of EMWD is the historic town of Temecula and surrounding Rancho California which is a rapidly developing, planned 87,500 acre, agricultural, industrial, commercial and residential community which is bisected by Interstate 15. Temecula and the eastern 41,000 acres of Rancho California are located in Subservice Area 44. The water supply to this area is from the Rancho California Water District, which is a subagency of EMWD. The supply for the area is well water supplemented with water from MWD's Skinner Filtration Plant.

EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city of Hemet, city of Perris, city of San Jacinto, Edgemont Gardens Mutual Water Company, Lake Hemet Municipal Water District, Nuevo Water Company, and Rancho California Water District. EMWD also supplies water, wholesale, to Elsinore Valley Municipal Water District and March Air Force Base, in accordance with contracts with Western Municipal Water District. The entities and public agencies within the West San Jacinto Groundwater Management area are shown in Figure 3-2 and are described below.

City of Perris. The city of Perris relies entirely on EMWD for its supply since local well water is high in TDS and chlorides. Water is supplied directly through three connections to EMWD's 1627 (Perris) pressure zone, and is provided on a demand basis. The city has water storage facilities consisting of a 1.0 MG and a 1.25 MG steel tank which have high water elevations of 1,595 feet.

Nuevo Water Company. Nuevo Water Company encompasses approximately 4,064 acres and supplies approximately 1,260 connections. The company has two wells with capacities of 1.01 mgd (700 gpm) and 0.58 mgd (400 gpm) and a 12-inch connection to EMWD's system. District water is used only as a supplemental supply to meet total maximum day summer demands of approximately 2.3 mgd.

Edgemont Gardens Mutual Water Company. Edgemont Gardens Mutual Water Company serves 661 acres and approximately 950 connections in the city of Moreno Valley. Their supply is provided by two 350-gpm wells and three connections to EMWD. Water from EMWD is used

to supplement their normal supply and to provide fire protection since their system does not have water storage facilities.

Brownlands Mutual Water Company. Brownlands Mutual Water Company encompasses 2,042 acres east of Lake Perris near the Badlands. The company does not have a water system and consequently, does not provide water service. A connection to EMWD's system has never been constructed for this subagency. In the future these areas will probably be supplied directly by EMWD.

Metropolitan Water District of Southern California

Metropolitan Water District of Southern California (Metropolitan) is a wholesale water agency serving supplemental imported water to 27 member cities and water agencies in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of about 15 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies of the study area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). Figure 3-3 shows the locations of Metropolitan's, state and EMWD imported water facilities.

Colorado River Water. The Colorado River Aqueduct, owned and operated by Metropolitan, transports water from Lake Havasu on the Colorado River, 242 miles to its terminus at Lake Matthews in Riverside County. Construction of the Colorado River Aqueduct began in 1931 and the first deliveries of water to member agencies took place in 1941.

Metropolitan's total entitlement to Colorado River water is approximately 1.39 million acre-ft/yr. This entitlement consists of a fourth priority right to 550,000 acre-ft/yr, a fifth priority right of 662,000 acre-ft/yr and surplus contract rights of 180,000 acre-ft/yr. Several irrigation districts hold higher priority rights to 3.85 million acre-ft/yr. Certain Indian reservations, towns and individuals also hold present perfected rights that predate Metropolitan's rights. In 1964, the United States Supreme Court limited California's diversions on a dependable basis to 4.4 million acre-ft/yr in the case *Arizona v. California*. As such, Metropolitan's diversions from the Colorado River on a dependable basis were limited to less than 550,000 acre-ft/yr. During declarations of surplus, Metropolitan has the highest priority of any California contractor to divert these surplus waters.

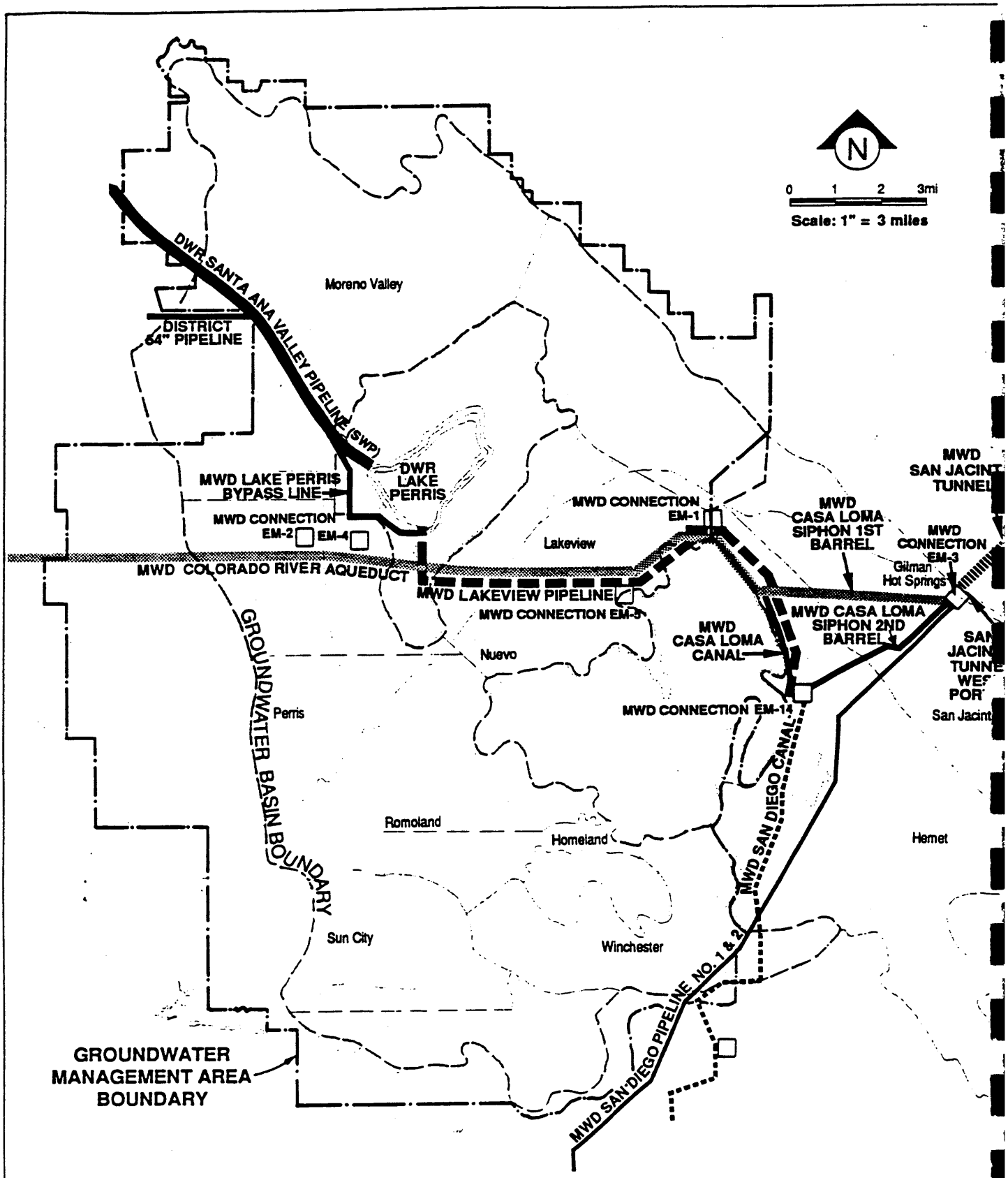

Figure 3-3
IMPORTED WATER FACILITIES

REFERENCE: EMWD WATER FACILITIES MASTER PLAN, *FIG. 4-3: SOURCES OF SUPPLY MAP*, OCTOBER, 1990.

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The Secretary of the Interior has the discretion to allow California to use any water that Arizona and Nevada have available from the Colorado River, but do not use. It is difficult to predict the criteria the Secretary will use in determining whether to release unused water to California. If the agricultural agencies in California do not use the entire supply available to them, Metropolitan has the right to divert the unused portion. Although agricultural use was less than 3.85 million acre-ft/yr throughout much of the mid 1980's, there was no unused agricultural priority water available in 1989.

Metropolitan is actively seeking additional water supplies from the Colorado River. Metropolitan recently signed a long-term agreement with the Imperial Irrigation District that will yield 106,110 acre-ft/yr of Colorado River water from implementation of specific water-saving measures. Metropolitan is pursuing several other projects to obtain increased Colorado River supplies including:

- Additional water conservation measures with Imperial Irrigation District
- Lining of the All-American and Coachella Canals to stop water seepage losses
- Groundwater storage project on the East Mesa of Imperial County
- Land fallowing program with Palo Verde Irrigation District

If all of these projects are implemented, Metropolitan's total Colorado River supplies could be about 1,000,000 acre-ft/yr by the year 2000 (Montgomery Watson, 1993).

State Project Water. Metropolitan's second source of water is the State Water Project (SWP). The SWP is owned by the State of California and operated by the California Department of Water Resources (DWR). This project transports water from the Sacramento-San Joaquin Delta via the California Aqueduct to thirty contract agencies in the state. The total length of the California Aqueduct is 444 miles.

Metropolitan has an entitlement to SWP water of 2,011,500 acre-ft/yr out of a total maximum contractual entitlement of 4.23 million acre-ft/yr for the 30 contractors. As currently developed, and under current Delta water quality standards, the SWP has an average yield during extended dry periods of approximately 2.4 million acre-ft/yr. Requested deliveries for 1993 totaled 3.6 million acre-ft/yr (agricultural contractors have had a 100 percent deficiency applied against them). Initial deliveries were estimated to be ten percent of the requests before the recent wet

period. Demands for SWP water are expected to increase to 4.15 million acre-ft/yr by the year 2010.

Metropolitan's water supply from the SWP also faces potential limitations in the future. The current firm yield of the SWP can currently supply only about one-half of the contract entitlements due to capacity limitations of existing facilities. The State Department of Water Resources is developing a program to increase the firm yield of the SWP through a combination of additional pumping facilities at the Delta, improved water management in the Delta, new surface reservoirs, and groundwater storage. These projects are expected to increase the dry period yield to 3.2 million acre-ft/yr by the year 2010 [DWR, Bulletin 132-89]. Metropolitan is pursuing its own program of groundwater storage and water transfers from other SWP contractors to increase its firm supplies.

The State Water Resources Control Board (SWRCB) has been conducting hearings and other proceedings in an on-going process to review the water quality objectives for the San Francisco Bay/Sacramento-San Joaquin Delta estuary. The SWRCB recently proposed more stringent water quality requirements for the Delta through its draft Decision D-1630. If adopted in its current form, D-1630 is expected to reduce deliveries to the SWP, the Central Valley Project and other Delta diverters by as much as 1.2 million acre-ft/yr depending on water supply conditions in the Delta. The impact of this decision on Metropolitan is still under study; however, preliminary estimates indicate a reduction on the order of 200,000 acre-ft/yr (Montgomery Watson, 1993).

REGULATION OF WASTEWATER

The West San Jacinto Groundwater Management plan will be influenced by the plans and policies of the Federal Environmental Protection Agency, State Water Resources Control Board, California Regional Water Quality Control Board, Santa Ana Region as well as the state and local health departments. A summary of the more important regulations of these agencies is presented in the following paragraphs.

Federal Environmental Protection Agency

On October 18, 1972, Congress passed the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). Those amendments have been acclaimed as "one of the most significant, most comprehensive, most thoroughly debated pieces of environmental legislation

ever to be considered by the Congress." The 1972 Act has been amended several times. The 1977 Amendments included a change in name to the Clean Water Act; however, the Act's goals and policy remain the same. Section 101(a) of the Act states:

> The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act--
>
> (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection of and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
>
> (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;
>
> (4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;
>
> (5) it is the national policy that area wide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State; and
>
> (6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans.

To reach these goals, the Act requires that a discharge of waste or waste-containing water be of a specified, improved quality before its release from a point source to the receiving water, or in some cases, that the discharge be prohibited. To assure that the improved quality is attained, the Act provides a new authority to the Federal and State governments to continue and fully develop a basin plan program as well as a national permit system. These two programs are discussed later in this Section under the California Regional Water Quality Control Board, Santa Ana Region.

State Water Resources Control Board

California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) establishes the responsibilities and authorities of the State Water Resources Control Board and the nine Regional Water Quality Control Boards. That Act names the Boards "...the principal state agencies with primary responsibility for the coordination and control of water quality."

In carrying out this responsibility, the State Water Resources Control Board coordinates a oversees the activities of the nine Regional Boards. It has also adopted several statewide poli controlling specific aspects of water quality. These policies which apply to the San Jacin Water Reclamation Program include:

Nondegradation Policy (1968). This is the single most important statewide water qua control policy (CRWQCB, SAR, 1984). It was adopted as SWRCB Resolution No. 68-1 "Statement of Policy with Respect to Maintaining High Quality Waters in California". T policy requires that high quality water be maintained and protected unless: (1) allowing so degradation is clearly in the best interests of the people of California as a whole, (2) that s allowable degradation does not preclude an identified (present or future) beneficial use, and that the applicable Basin Plan or some statewide policy takes note of the change in question a concedes that it is appropriate.

Reclamation Policy (1977). The "Policy and Action Plan for Water Reclamation in Califor recognizes the present and future need for increased amounts of water in California, primarily support growth. This policy commits both the State Board and the nine Regional Board support reclamation and reclamation projects which are consistent with sound principles a demonstrated needs.

California Regional Water Quality Control Board, Santa Ana Region

The California Regional Water Quality Control Board, Santa Ana Region, controls water quali within its region by adoption and implementation of a basinwide water quality control p (Basin Plan) and waste discharge requirements for individual dischargers within its regio These two programs, as they relate to the West San Jacinto Groundwater Management Plan, discussed in the following paragraphs.

Basin Plan. The Porter-Cologne Act directs each Regional Board to "...formulate and ad water quality control plans for all areas within the region." A water quality control pla defined as having three components: beneficial uses which are to be protected, water qua objectives which protect those uses, and an implementation plan which accomplishes tho objectives. For the Santa Ana Region, the original basin plan was adopted in 1975 and amen in 1983. As required, that plan is again being reviewed and updated where necessary.

The objective of that plan entitled: "Water Quality Control Plan for the Santa Ana River Basin (8)" is to show how the quality of the surface and ground waters in the Santa Ana Region should be controlled to provide the maximum benefit possible. As stated in that plan:

> The uses made of water and the benefits derived from it are varied, and the quality of the water is an important factor. For example, drinking water has to be of higher quality than water used to irrigate pastures. Both are legitimate uses, but the quality requirements for irrigation are different from those for domestic use. The plan recognizes such variations. First, it lists the uses to which the various waters are put (Beneficial Uses, Chapter 3). Second, it describes the water quality which must be maintained to allow those uses (Water Quality Objectives, Chapter 4). Federal terminology is somewhat different, in that beneficial uses and water quality objectives are combined and the combination is called Water Quality Standards. Chapter 5, the Implementation Plan, then describes the programs, projects and other actions which are necessary to achieve the goals of this plan. Chapter 6, Monitoring and Assessment, discusses the impacts the plan will have.

Applicable sections of the 1994 Basin Plan are summarized in the following paragraphs.

Beneficial uses. Beneficial uses that are to be protected in the West San Jacinto Groundwater Management Plan are shown in Tables 3-1 and 3-2.

Water Quality Objectives. The narrative objectives below apply to all inland surface waters, including bays and estuaries, and to groundwaters, as noted within the region. In addition, specific numerical objectives are listed in Tables 3-3 and 3-4. Where more than one objective is applicable, the stricter shall apply.

Trace constituents. The concentrations of trace constituents in groundwaters designated MUN shall not exceed the values listed immediately below.

Arsenic	0.05 mg/l	Iron	0.3 mg/l
Barium	1.0 mg/l	Lead	0.05 mg/l
Cadmium	0.01 mg/l	Manganese	0.05 mg/l
Chromium	0.05 mg/l	Mercury	0.002 mg/l
Cobalt	0.2 mg/l	Selenium	0.01 mg/l
Cyanide	0.2 mg/l	Silver	0.05 mg/l
Fluoride	1.0 mg/l		

California Department of Health Services

Recharge of reclaimed water can occur through surface spreading, direct injection and by over irrigation. Recharge by percolation and injection is subject to regulatory approval. The Department of Health Services (DHS) has released proposed regulations for planned recharge projects that recharge reclaimed water. If the proposed regulations are adopted, strict criteria

TABLE 3-1
BENEFICIAL USES OF SURFACE WATERS

Water Body	Municipal and Domestic Supply	Industrial Service Supply	Agricultural Supply	Groundwater Recharge	Water Contact Recreation	Non-contact Water Recreation	Warm Freshwater Habitat	Wildlife Habitat	Cold Freshwater Habitat
San Jacinto River					I		I		
Reach 3	I		I	I	I	I	I	I	
Reach 4	I		I	I	I	I	I	I	
Canyon Lake *	X	X	X	X	X	X	X	X	X
Lake Elsinore					X	X	X	X	

I = Intermittent Beneficial Use
X = Present or Potential Beneficial Use
*Note - Canyon Lake is Reach 2

TABLE 3-2
GROUNDWATER BENEFICIAL USES

Groundwater Subbasin	Municipal and Domestic Supply	Agricultural Supply	Industrial Service Supply	Industrial Process Supply
San Jacinto - Lower Pressure	X	X	X	
Lakeview	X	X	X	X
Perris North	X	X	X	X
Perris South I	X	X		
Perris South II	X	X		
Perris South III		X		
Winchester	X	X		
Menifee I	X	X	X	
Menifee II	X	X	X	

I = Intermittent Beneficial Use

X = Present or Potential Beneficial Use

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TABLE 3-3
SURFACE WATER QUALITY OBJECTIVES
(mg/l)

Water body	Total Dissolved Solids	Total Hardness	Sodium	Chloride	Total Inorganic Nitrogen	Sulfate	Filtered Biochemical Oxygen Demand	Filtered Chemical Oxygen Demand
San Jacinto River								
Reach 3	820	400		250	6		7	15
Reach 4	500	220	75	125	5	65		
Canyon Lake*	700	325	100	90	8	290		

Note - Canyon Lake is Reach 2

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TABLE 3-4
GROUNDWATER QUALITY OBJECTIVES
(mg/l)

Groundwater Subbasin	Total Dissolved Solids	Total Hardness	Sodium	Chloride	NItrate as NItrogen	Sulfate
San Jacinto - Lower Pressure	800	380	120	100	3	330
Lakeview	500	190	80	160	2	25
Perris North	300	100	70	90	3	15
Perris South I	1000					
Perris South II	2000					
Perris South III	1500					
Winchester	1200					
Menifee I	2000					
Menifee II	1500					

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must be satisfied for a planned recharge project using reclaimed water. In the interim, the Regional Board and the DHS are requiring agencies interested in recharge of reclaimed water to follow the proposed regulations. The proposed regulations are included in Appendix A-1.

The proposed regulations define four categories of recharge projects:

> Project Category I - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment), disinfected and subjected to organics removal.
>
> Project Category II - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment) and disinfected.
>
> Project Category III - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment) and disinfected.
>
> Project Category IV - Direct injection project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment), disinfected and subjected to organics removal.

For project categories I and IV, the maximum amount of reclaimed water that can be captured by any well is a function of the total organic carbon (TOC) in the reclaimed water. The maximum contribution of reclaimed water at a well for categories I and IV is 50 percent. Table 3-5 shows the maximum allowable contributions of reclaimed water in a well as a function of the TOC in the reclaimed water after organics removal. Table 3-6 summarizes other important operational criteria from the proposed recharge guidelines. The maximum allowable reclaimed water contributions in any well for categories II and III is 20 percent. With the exception of nitrogen compounds, reclaimed water quality used for planned recharge projects must meet Title 22 standards for drinking water quality (Title 22, Division 4, Chapter 15, Sections 64435, 64443, 64444.5 and 64473). The total nitrogen concentration of reclaimed water used in recharge projects shall not exceed 10 mg/L as nitrogen, unless the project sponsor can demonstrate that the standard can be consistently met prior to reaching the groundwater level. The minimum retention time in the groundwater prior to production shall be six months for categories I and II, and twelve months for categories III and IV. The minimum horizontal separation between the recharge facility and a producing domestic well is 500 feet for categories I and II; 1000 feet for category III and 2,000 feet for category IV. The project sponsor must have the authority to prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation. The proposed regulations require rigorous groundwater and reclaimed water monitoring.

TABLE 3-5
MAXIMUM ALLOWABLE TOC AFTER ORGANICS REMOVAL IN RECLAIMED WATER

	Maximum TOC Concentration (mg/L)	
Reclaimed water Contribution (%)	Surface Spreading Category I	Direct Injection Category IV
0 - 20	20	5
21 - 25	16	4
26 - 30	12	3
31 - 35	10	3
36 - 45	8	2
46 - 50	6	2

TABLE 3-6
KEY CRITERIA FOR RECLAIMED WATER RECHARGE PROJECT

Criterion	Category I	Category II	Category III	Category IV
Maximum Contribution of Reclaimed Water in Water at Domestic Wells (1)	50%	20%	20%	50%
Minimum Horizontal Separation Between Point of Recharge and Domestic Wells (feet)	500	500	1,000	2,000
Minimum Retention Time in Groundwater (months)	6	6	12	12

note - (1) see Table 7-1 for categories I and IV

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Direct Discharge into a Water System. A plan that involves direct discharge into a domestic water supply system or storage unit for the near future (within the next decade) is not acceptable because of the uncertain health implications. DHS will recommend against the element of a basin plan which contains such a proposal.

Where a plan requiring a near-term decision involves options or alternatives for the use or disposal of the wastewater, DHS will reject the domestic water reuse alternative and consider the remaining options as the proposals for evaluation.

Direct discharge into a water system may be presented in a plan as a future option which may be appraised as additional information becomes available and future needs and attitudes are clearer.

REGULATION OF DRINKING WATER

A summary of existing and proposed water quality standards is presented in Appendix A-2. Both primary Maximum contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs) are shown as proposed, promulgated, and implemented by EPA and DHS. The more rigorous of the two standard MCLs for any contaminant must be satisfied.

LOCAL PLANNING AND REGULATORY AGENCIES

Other local agencies that may have a significant influence on groundwater management include:

> Riverside County Flood Control and Water Conservation District. This agency plans, constructs and operates flood control and water conservation facilities in Riverside County. The construction of flood control and water conservation facilities affects the volume of recharge to groundwater and thus has a potentially significant impact.
>
> Riverside County Planning. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.
>
> Riverside County Health Department. The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.

SECTION 4

SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

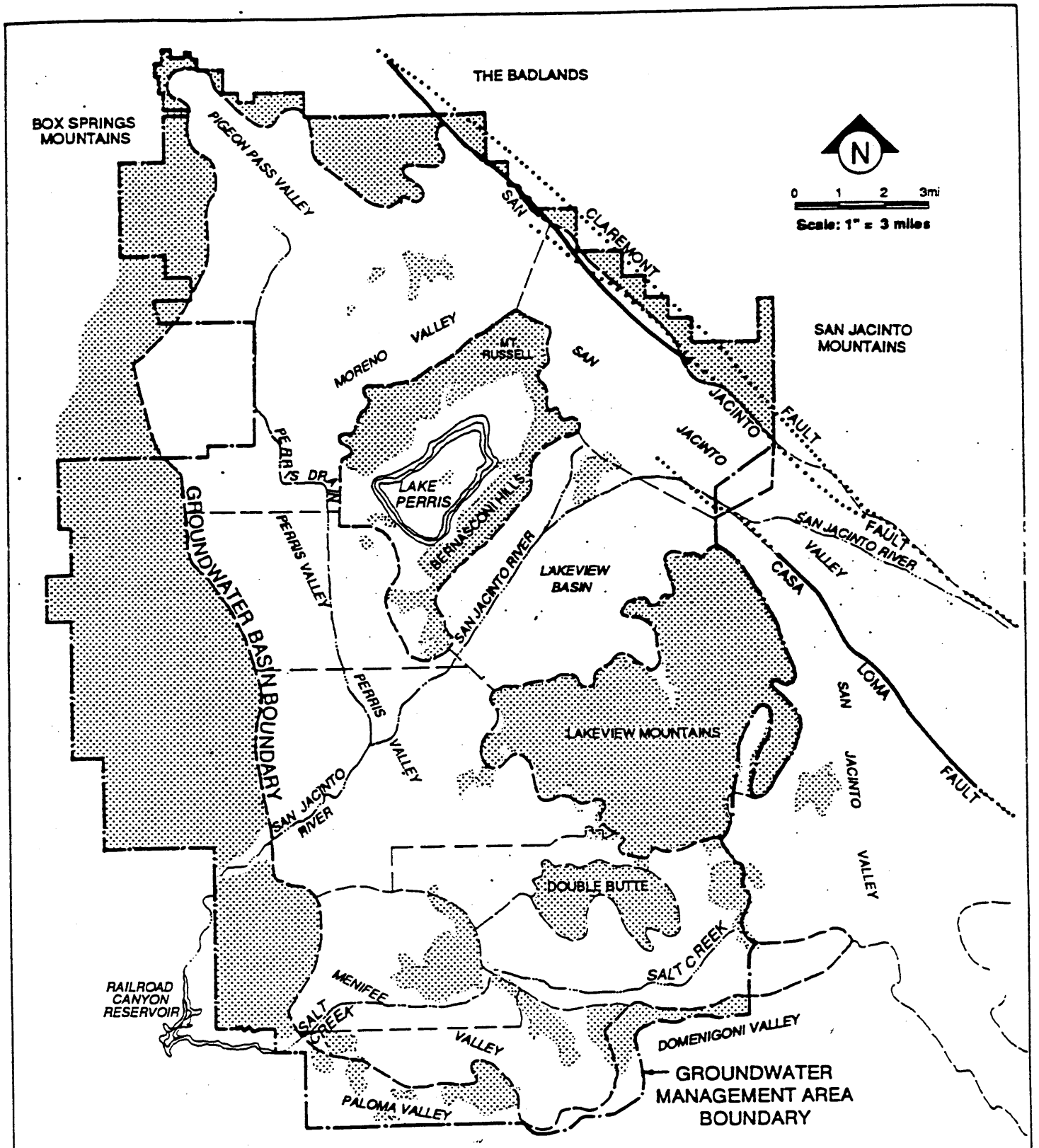
PHYSICAL FEATURES

Figure 4-1 shows the major physical features, waterbearing and non-waterbearing areas of the groundwater management area. The major physical features in the study area include the San Jacinto mountains, the Badlands, the San Jacinto River, Salt Creek, Perris Valley Drain, the San Jacinto and Casa Loma faults, the Lakeview mountains, the Bernasconi Hills, and Double Butte. The management area groundwater basins are shown in Figure 4-2 and include the Perris North, Perris South I, II and III, Menifee I and II, Winchester, Lakeview and the San Jacinto Lower-Pressure subbasins.

The San Jacinto mountain range, which dominates the area, was formed about 130 million years ago when subsurface activity thrust the igneous (formed under extreme heat) rock upward. Continued erosion reduced the mountain range and its adjacent area, and the resulting sediments were deposited in the valleys of the management area. These are called alluviated valleys and the deposited sediments are termed alluvium (California Department of Water Resources, 1978). The aquifers in the management area consist of interbedded gravels, sands, silts, and clays. In general, coarser alluvium occurs near the sources of the alluvium and the finer alluvium occurs further away from the sources. The sources of alluvium include the mountains, hills and badland areas that border the management area. Coarser alluvium also occurs in the vicinity of significant streambeds grading to finer alluvium away from the streambeds.

The Perris Subbasins

The Perris Basin has been subdivided into Perris North, Perris South-I, Perris South-II and Perris South-III subbasins. This division is based on water quality variations and has no hydrologic



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 4-1
MAJOR PHYSICAL FEATURES

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REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

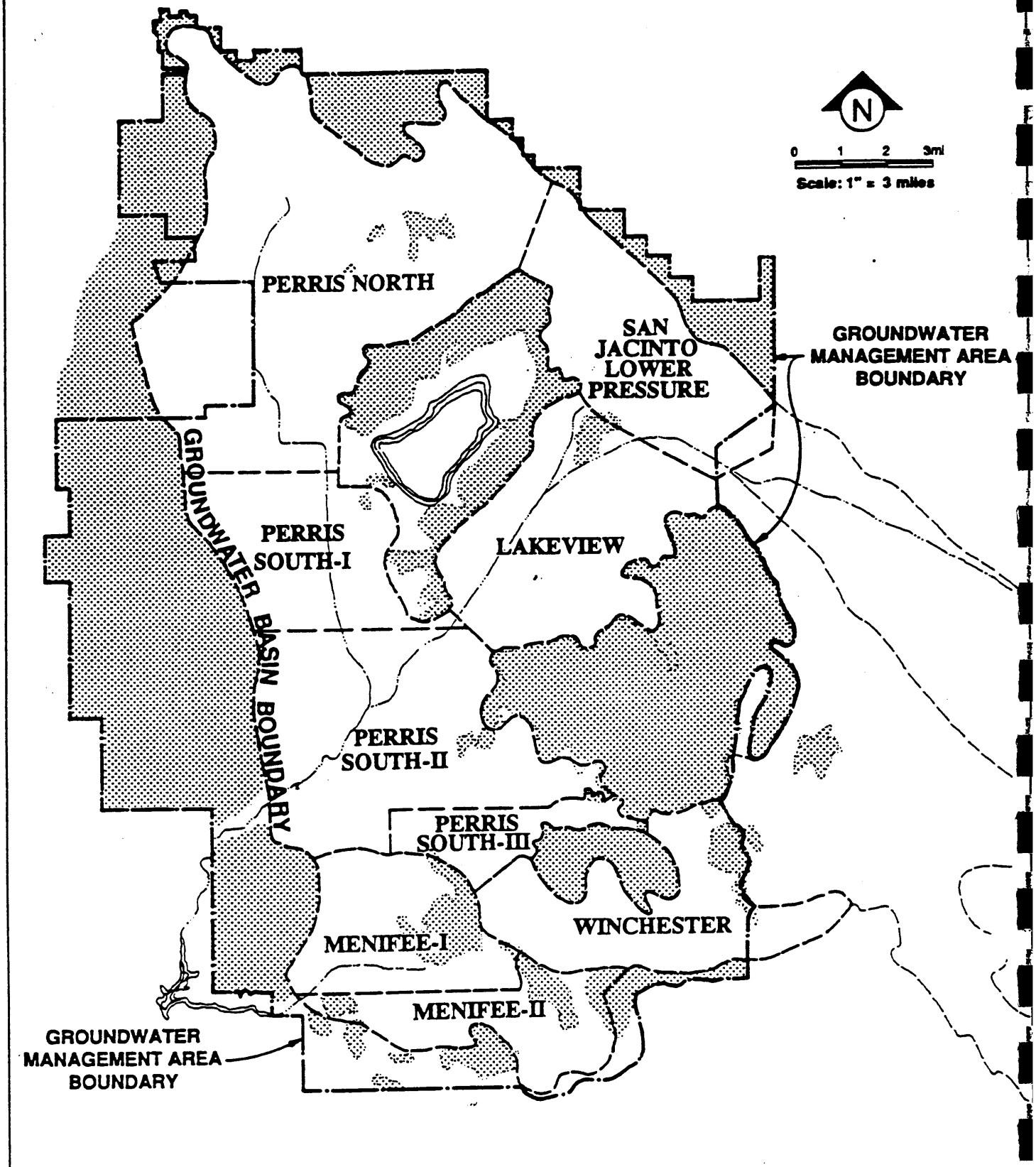

Figure 4-2
GROUNDWATER SUBBASINS

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significance. The Perris North subbasin is bounded on the north by Box Springs Mountains and the Badlands; on the east by San Jacinto Lower-Pressure subbasin and unnamed hills north of Lake Perris; on the south by the Perris South-I subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Perris South-I subbasin is bounded on the north by the Perris North subbasin; on the east by the southerly extension of the Bernasconi Hills; on the south by the Perris South-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

Perris South-II is bounded on the North by the Perris South-I subbasin, on the east by the Lakeview subbasins and the Lakeview mountains; on the south by the Menifee-I and Perris South-III subbasins; and on the west by a series of extensive non-waterbearing hills and plateaus.

The Perris South-III subbasin is bounded on the north and west sides by the Perris South-II subbasin; on the east by the Lakeview mountains and the Winchester subbasin; and on the south by the Double Butte hills, the Winchester subbasin and the Menifee-I subbasin.

The Perris subbasins are considered one hydrologic basin. The Perris North subbasin consists of tonalite and granodiorite mountains surrounding alluvium and older alluvium to 600 feet in depth, over tonalite and granodiorite basement rocks. The northeasterly section near Moreno consists of alluvium up to about 850 feet in depth, over undifferentiated granitic basement rocks.

The Perris South I and Perris South II subbasins consist of alluvium at depths ranging from a few hundred to 1,000 feet, extending southerly, through the mid Perris Valley and into the Menifee subbasin to the south. The base of the aquifer consists of tonalite and granodiorite basement rocks. Mountains composed of tonalite and granodiorite basement rocks bound the southwestern and southeastern area. Clays and gravels are in the central and southern sections, with waterbearing sediments beginning at a depth of 100 feet.

Table 4-1 summarizes available well test data and aquifer characteristics (California Department of Water Resources, 1978). The depth of wells in the Perris North and South subbasins is reported to range from 200 to 800 feet below ground surface (ft-bgs), with production rates ranging from 90 to about 1,000 gallons per minute (gpm). Based on interpretation of well efficiency tests, the transmissivity of these subbasins is estimated to range between 3,600 to 64,800 gallons per day, per foot (g/d/ft). Transmissivity is a measure of how well the aquifer

TABLE 4-1
AVAILABLE PUMP TEST DATA
WELL CHARACTERISTICS AND AQUIFER PROPERTIES

Basin	Number of wells	Depth of Wells (ft-bgs)			Production (gpm)			Transmissivity (gpm/ft/day)			Specific Yield		
		Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
Perris	42	200	800	440	90	1,000	400	3,600	64,800	16,200	0.04	0.14	0.08
Lakeview	31	300	1,000	450	100	2,000	690	1,800	90,000	34,200	0.04	0.16	0.12
Winchester	9	200	600	450	100	850	300	3,600	14,400	10,800	0.04	0.11	0.09
Menifee	7	100	600	500	10	1,000	330	1,800	108,000	23,400	0.06	0.11	0.08

Source: Water Resources Evaluation of the San Jacinto Area, DWR, 1978; Plate 2, TIR 1335-11-A-2 Preliminary Evaluation of Storage Capacity and Specific Yield of Groundwater Basins in the San Jacinto Study by Area.

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transmits water. Transmissivities for large municipal wells usually exceed 30,000 g/d/ft, with larger values being better. Specific yield is a measure of the aquifer's ability to store water. Specific yield is numerically equal to the fraction of the water that, after saturation, can be drained by gravity from the unit volume of the aquifer. Larger values of specific yield imply greater storage capacity and less regional drawdown. Based on well construction logs, the specific yield in the Perris subbasins is estimated to range from .04 to .14.

The Menifee Subbasins

The Menifee basin has been subdivided into the Menifee-I and Menifee-II subbasins. As with the Perris subbasins, this division is based on water quality variations and has no hydrologic significance. The Menifee-I subbasin is bounded on the North by the Perris South-II and Perris South-III subbasins; on the east by unnamed hills and the Winchester subbasin; on the south by Menifee-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Menifee-II subbasin is bounded on the north by the Menifee-I and Winchester subbasins and unnamed hills; on the east by Domenigoni Valley; and on the south by a saddle-shaped feature consisting of unnamed hills and Paloma Valley.

Alluvium, up to 900 feet in the north, extends into the Railroad Canyon area in the west and toward the east and southeast boundaries. The base of the aquifer consists of tonalite and granodiorite basement rocks. Waterbearing sediments consist of coarse gravel and sandy disintegrated coarse granite. The base of the aquifer occurs at a depth of 800 feet in the center of the valley and reaches 1,200 feet in the northern and eastern portions of the valley.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Menifee subbasins is reported to range from 100 to 600 ft-bgs, with production rates ranging from 10 to about 1,000 gpm. The transmissivity is estimated to range between 1,800 to 108,000 g/d/ft. The specific yield is estimated to range from .06 to .11.

Winchester Subbasin

The Winchester subbasin is bounded on the north by the Double Butte hills and Lakeview mountains; on the east by the Hemet subbasin; on the south by a line of unnamed hills that

separate the Winchester subbasin from Domenigoni and Menifee valleys; and on the west by Perris South-III.

The western and southern sections mainly consist of alluvium from depths of a few hundred to 1,000 feet. The base of the aquifer consists of tonalite and granodiorite along the western, southern and northern boundaries and to the north are tonalite and granodiorite basement rocks and the underlying basement tonalite and granodiorites of the surrounding mountains. Clay and gravel with uniform stratification prevail except for fine sands in the northern and southern borders. Salt Creek, a San Jacinto River tributary, crosses the subbasin from east to west, providing surface drainage.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Winchester subbasin is reported to range from 200 to 600 ft-bgs with production rates ranging from 100 to about 850 gpm. The transmissivity is estimated to range between 3,600 to 14,400 g/d/ft. The specific yield is estimated to range from .04 to .11.

Lakeview Subbasin

The Lakeview subbasin is bounded on the northwest by the Bernasconi hills; on the northeast by the San Jacinto Lower Pressure subbasin; on the southeast by the Lakeview Mountains; and on the southwest by the Perris South-I and Perris South-II subbasins. The subsurface geology consists mainly of alluvium reaching over 1000 feet in depth.

In the northeast section near the base of the Badlands, waterbearing sediments are at about 100 feet in sandy shales. Elsewhere, in the north and northeast sections, waterbearing sediments are at depths over 150 feet or more, in relatively thin strata, with clay predominating. The central and southern sections are clays and gravels with waterbearing sediments occurring at 100-foot depths or more.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Lakeview subbasin is reported to range from 300 to 1,000 ft-bgs with production rates ranging from 100 to about 2,000 gpm. The transmissivity is estimated to range between 1,800 to 90,000 g/d/ft. The specific yield is estimated to range from .04 to .16.

San Jacinto Lower Pressure Subbasin

The San Jacinto Lower Pressure subbasin is bounded by the San Jacinto Mountains on the east, Bridge Street on the south, the Casa Loma fault on the west, and the westerly line of Range 2 West on the north. This subbasin has alluvium to about 1,200 feet deep, is comprised mostly of clays and silt and produces little water. The transmissivity of the subbasin has not been characterized.

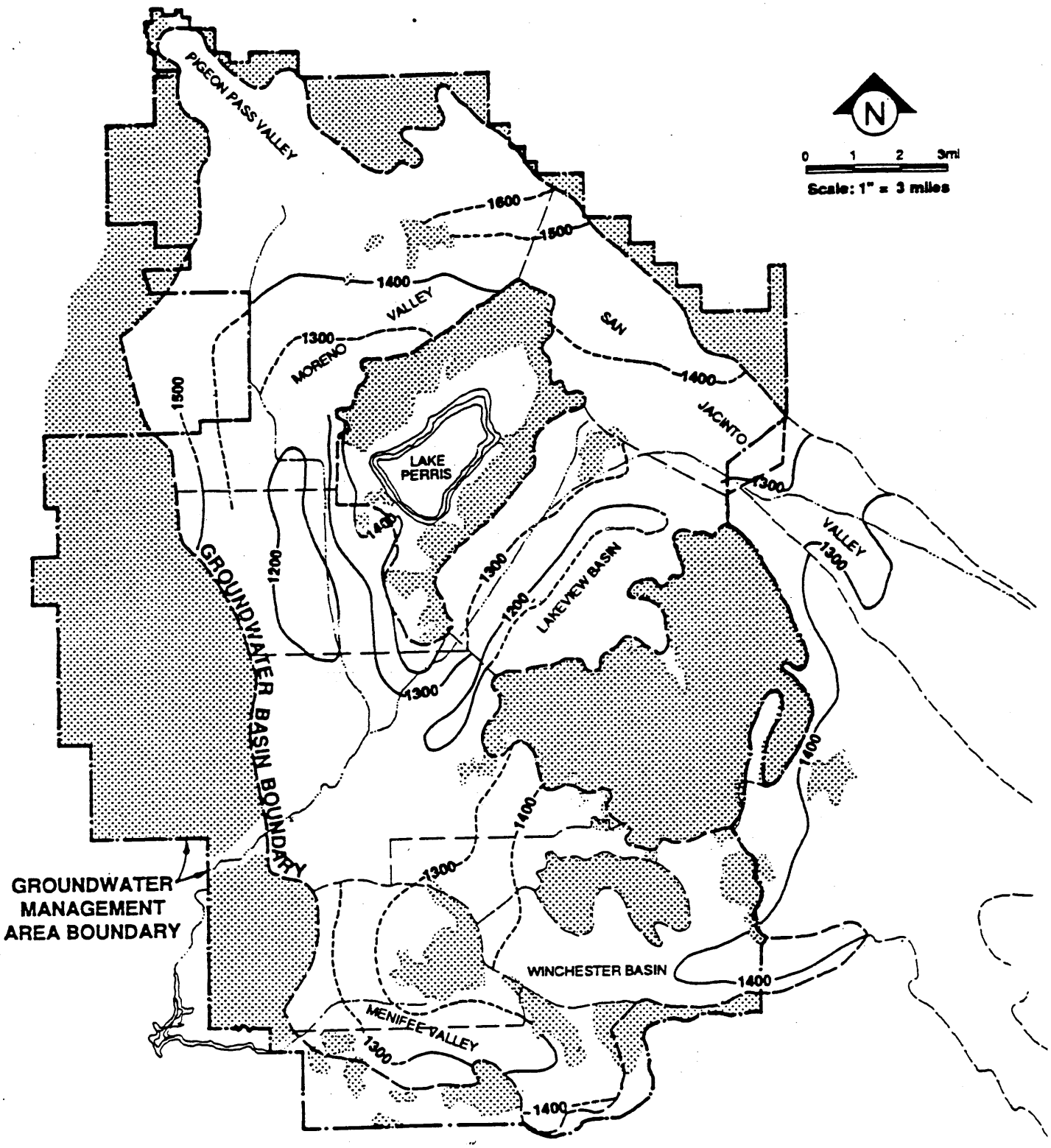
GROUNDWATER HYDROLOGY OF THE WEST SAN JACINTO BASIN

Groundwater Levels and Movement

Historically, the movement of groundwater generally followed the land surface profile toward and along the San Jacinto River and Salt Creek. Groundwater intersected the ground surface in San Jacinto Creek as the creek left the Perris South-II subbasin, and where Salt Creek exited the Menifee-I subbasin. The natural groundwater flow pattern has been altered by groundwater production.

Figure 4-3 is a groundwater elevation map for the West San Jacinto Groundwater basin area that corresponds to Spring 1974 conditions (California Department of Water Resources, 1978). Figure 4-4 is a comparable map for 1993. In 1974 there was subsurface flow from the San Jacinto Lower Pressure and Perris South I subbasins into Lakeview subbasin indicating that groundwater production in the Lakeview subbasin was large enough to reverse the historical groundwater flow direction from Lakeview to Perris South II subbasins. Groundwater originating in Perris North subbasin flowed into the San Jacinto Lower Pressure and Perris South subbasins. Groundwater in Perris South I flowed south to Perris South II. Groundwater in the Menifee subbasins and Winchester subbasin flowed north into Perris South II and Perris South III respectively. The groundwater from the Hemet subbasin flowed west into the Winchester subbasin.

Flow patterns have changed slightly in the intervening period of 1974 to 1993. Currently, groundwater continues to flow from the San Jacinto Lower Pressure and Perris South II subbasins into Lakeview subbasin; and from the Perris North subbasin into the Perris South I subbasin and continuing to Perris South II. The differences are as follows: there is a groundwater divide in the Menifee subbasin with some groundwater flowing north into Perris



LEGEND:

NONWATER-BEARING PORTION

—1200— CONTOURS IN FEET BASED ON NEARBY DATA

- - - - - INFERRED CONTOURS

Figure 4-3
GROUNDWATER ELEVATION MAP, 1974

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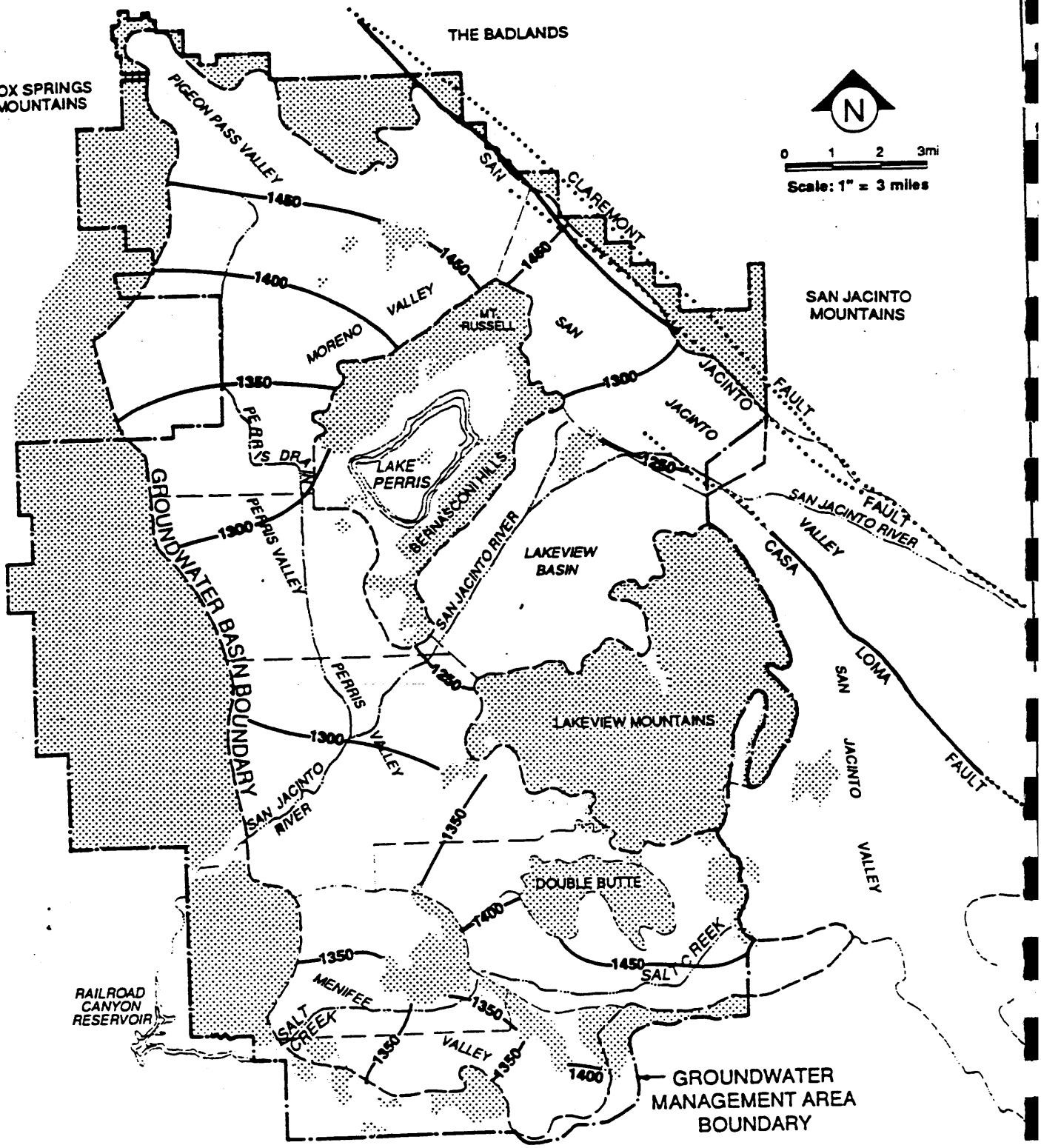
REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.



LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS
- —1450— CONTOURS IN FEET BASED ON NEARBY DATA

Figure 4-4
GROUNDWATER ELEVATION MAP, 1993

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South II subbasin, the remainder to a pumping depression in the Menifee II subbasin; groundwater in the Winchester subbasin flows northwest into the Perris South III subbasin and to the east into the Hemet subbasin.

The groundwater elevation changes between 1974 and 1993 are as follows:

San Jacinto Lower Pressure	-50 to -100 feet
Perris North	generally unchanged
Perris South I	+50 to +100 feet
Perris South II	+50 to +100 feet
Perris South III	+25 to +50 feet
Menifee I	+50 feet
Menifee II	+50 feet
Winchester	+25 to +50 feet
Lakeview	slightly less

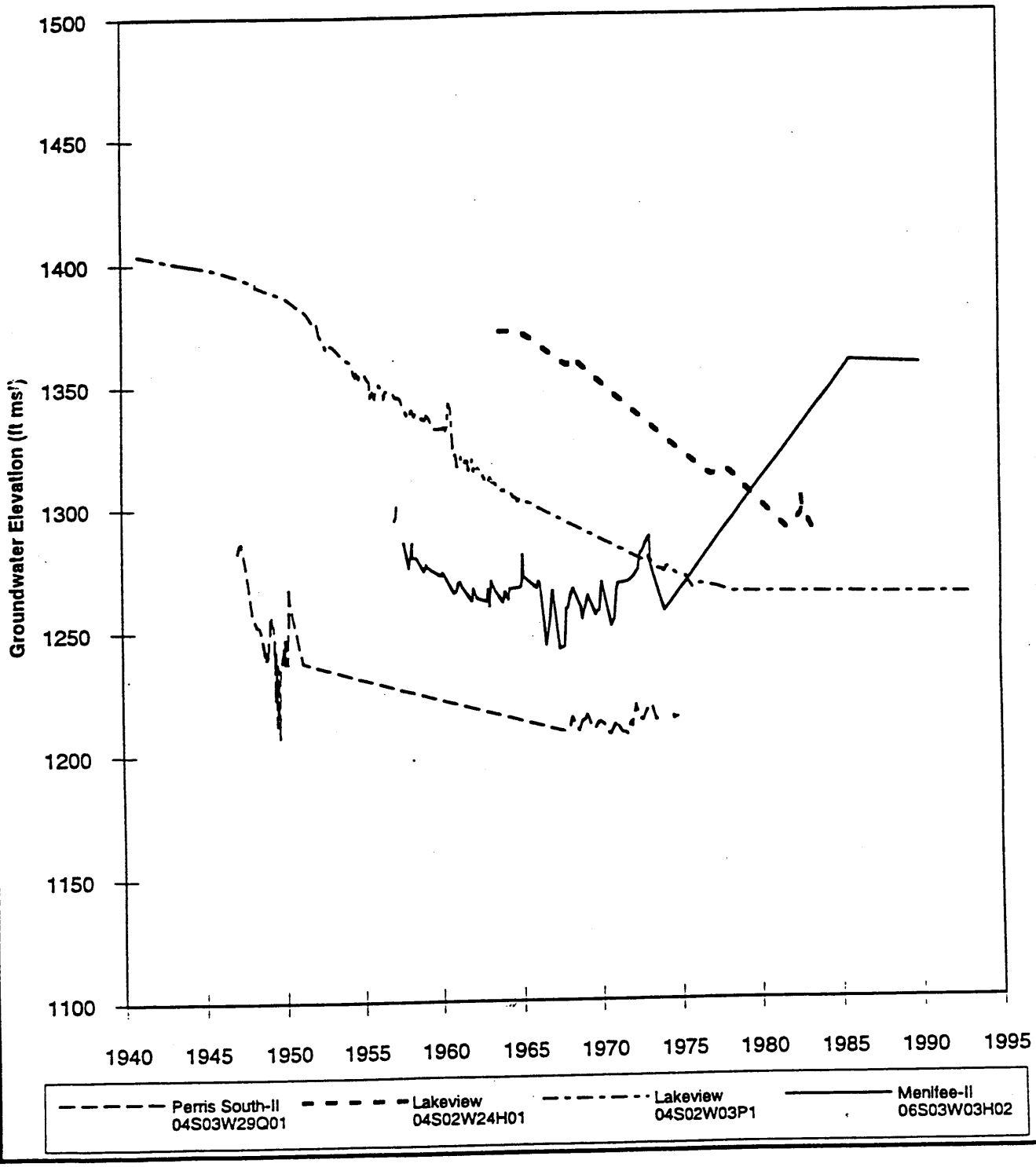
Generally, water levels will fluctuate both seasonally and on a long-term basis. Records of water levels in wells for the last 45 years generally indicate that the water table declined during the period of 1945 to the mid-seventies and recovered somewhat from the mid-1970's to the present. This long term trend was caused by a drought period that occurred from the mid 1940's to 1977, which was followed by an extremely wet period from 1978 to 1983. Agricultural use of groundwater has declined over the last twenty years without a concurrent increase in domestic groundwater usage.

Water levels are usually higher in the winter and spring months, when precipitation is greatest and there is less pumping than in the summer and fall months. When water levels in an area are declining from year to year, this indicates that more ground water is being removed from the area than is being replenished. Water levels were declining on a yearly basis through the mid 1970's. Groundwater elevation time-histories for selected wells are shown in Figure 4-5 for the Perris, Lakeview and Menifee subbasins; and Figure 4-6 for the Winchester and San Jacinto Lower Pressure subbasins. These hydrographs indicate the degree of groundwater level fluctuations that can occur in groundwater levels over the long term and seasonally.

Groundwater Hydrology

The occurrence and quality of groundwater in the West San Jacinto Basin groundwater management area are directly affected by the volume and quality of the water that recharges the area.

FIGURE 4-5 GROUNDWATER ELEVATION IN PERRIS, LAKEVIEW AND MENIFEE SUBBASINS



B&W Chart A
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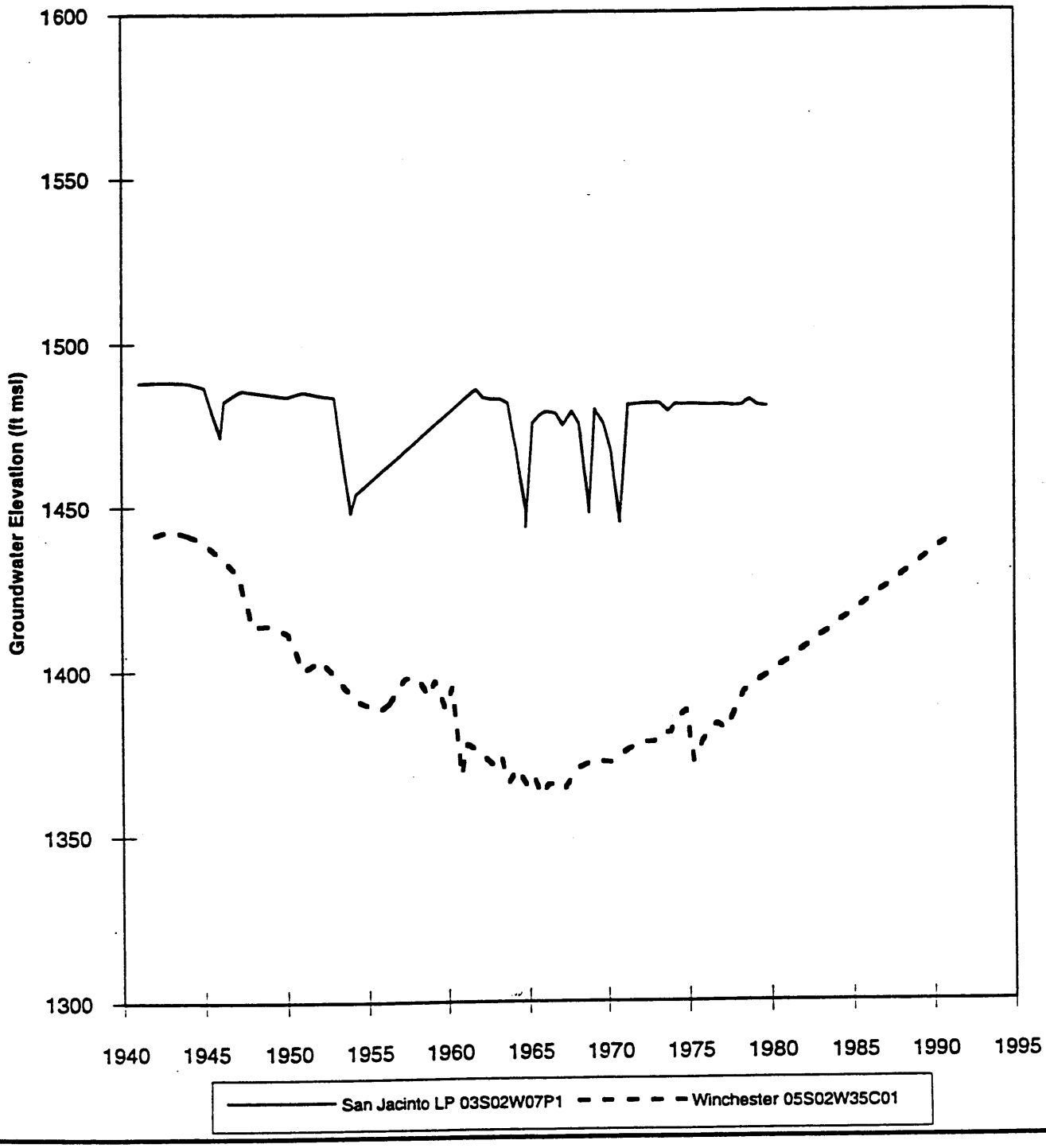
FIGURE 4-6 GROUNDWATER ELEVATION IN SAN JACINTO AND WINCHESTER SUBBASINS



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Recharge Components. Recharge in the management area consists of the following hydrologic components:

- ❑ deep percolation of stormflows
- ❑ deep percolation of precipitation
- ❑ deep percolation of applied water
- ❑ artificial recharge of imported water
- ❑ subsurface inflow from adjacent groundwater basins; and
- ❑ subsurface inflow from adjacent non-groundwater areas.

Estimates of these components were made by Water Resources Engineers in 1973 (Water Resources Engineers, 1973) and were updated in 1988 (Camp, Dresser & McKee, 1988). Table 4-2 lists the average annual value for each of these recharge components for year 2000 land use conditions for each subbasin. Values for Perris South-I, Perris South-II and Perris South-III are aggregated into Perris South. The Menifee subbasins have also been aggregated into one subbasin. These data were used in the 1994 Water Quality Control Plan (Basin Plan) developed by the Santa Ana Regional Water Quality Control Board (Regional Board). These components are described below.

Streambed Percolation. Stormflow percolation consists of percolation of stormflow in unlined channels and spreading grounds. The major unlined streams in the management area are the San Jacinto River, Perris Valley drain and Salt Creek. Table 4-2 contains estimates of stormflow percolation for each subbasin. Long term average stormflow percolation varies from about 300 acre-ft/yr for the Menifee subbasin, to a high of about 3,500 acre-ft/yr for the Perris North subbasin. The total stormflow percolation for the management area averages about 8,700 acre-ft/yr.

Percolation of Precipitation. Deep percolation of precipitation occurs when precipitation exceeds soil moisture demand. Soil moisture demand is the total water necessary to fully wet the soil and satisfy consumptive requirements of local vegetation. In most years, precipitation will not directly recharge groundwater unless the soil is kept wet from high precipitation and irrigation. Figure 4-7 shows the average annual precipitation in the management area. The average annual

TABLE 4-2
HYDROLOGIC COMPONENTS OF THE WEST SAN JACINTO BASINS
YEAR 2000 CONDITIONS PER BASIN PLAN
(acre-ft/yr)

Hydrologic Components	Subbasin						Total for West San Jacinto Basin
	Lakeview	Menifee	Perris North	Perris South	San Jacinto Lower Pressure	Winchester	
Inflow Components							
Stream Bed Percolation	1,200	300	3,500	1,600	1,000	1,100	8,700
Percolation of Precipitation	1,600	1,200	1,100	1,200	900	400	6,400
Imported Water Recharge	0	0	0	0	0	0	0
Local Stream Flow Diverted for Recharge	0	0	0	0	0	0	0
Subsurface Inflows from Mountain Boundaries	1,500	0	1,300	0	0	0	2,800
Deep Percolation of Applied Water	2,500	3,200	13,600	10,000	1,400	1,500	32,200
Municipal Wastewater	0	1,400	5,800	4,500	0	200	11,900
Irrigation	2,500	1,800	7,800	5,500	1,400	1,300	20,300
Subtotal Inflow	6,800	4,700	19,500	12,800	3,300	3,000	50,100
Outflow Components							
Subsurface Outflows to	0	0	0	0	800	1,200	2,000
Outside of WSJ Area	0	0	0	0	800	1,200	2,000
Groundwater Production(1)	4,000	0	2,300	1,400	500	0	8,200
Subtotal Outflow	4,000	0	2,300	1,400	1,300	1,200	10,200
Summary Statistics							
Approximate Net Inflow (natural safe yield)	6,800	3,300	13,700	8,300	2,500	1,600	36,200
Approximate Net Inflow plus Intentional Wastewater Recharge	6,800	4,700	19,500	12,800	2,500	1,800	48,100
Volume of Groundwater in Storage	283,000	56,000	123,000	248,000	382,000	36,000	1,128,000
Storage Capacity	515,000	101,000	347,000	402,000	391,000	41,000	1,797,000

Source - All hydrologic components from Basin Planning Model projections (JMM, 1991) except for groundwater production which was estimated from data in Table 4-3 and EMWD; and intentional wastewater recharge which came from EMWD (EMWD,1993).

(1) Excludes groundwater production from individual residences where production is less than 25 acre-ft/yr; groundwater production estimates based on land use are much higher and are projected to be about 26,600 acre-f/yr.

(2) Subtotal excludes subsurface flows between subbasins within the West San Jacinto Basin.

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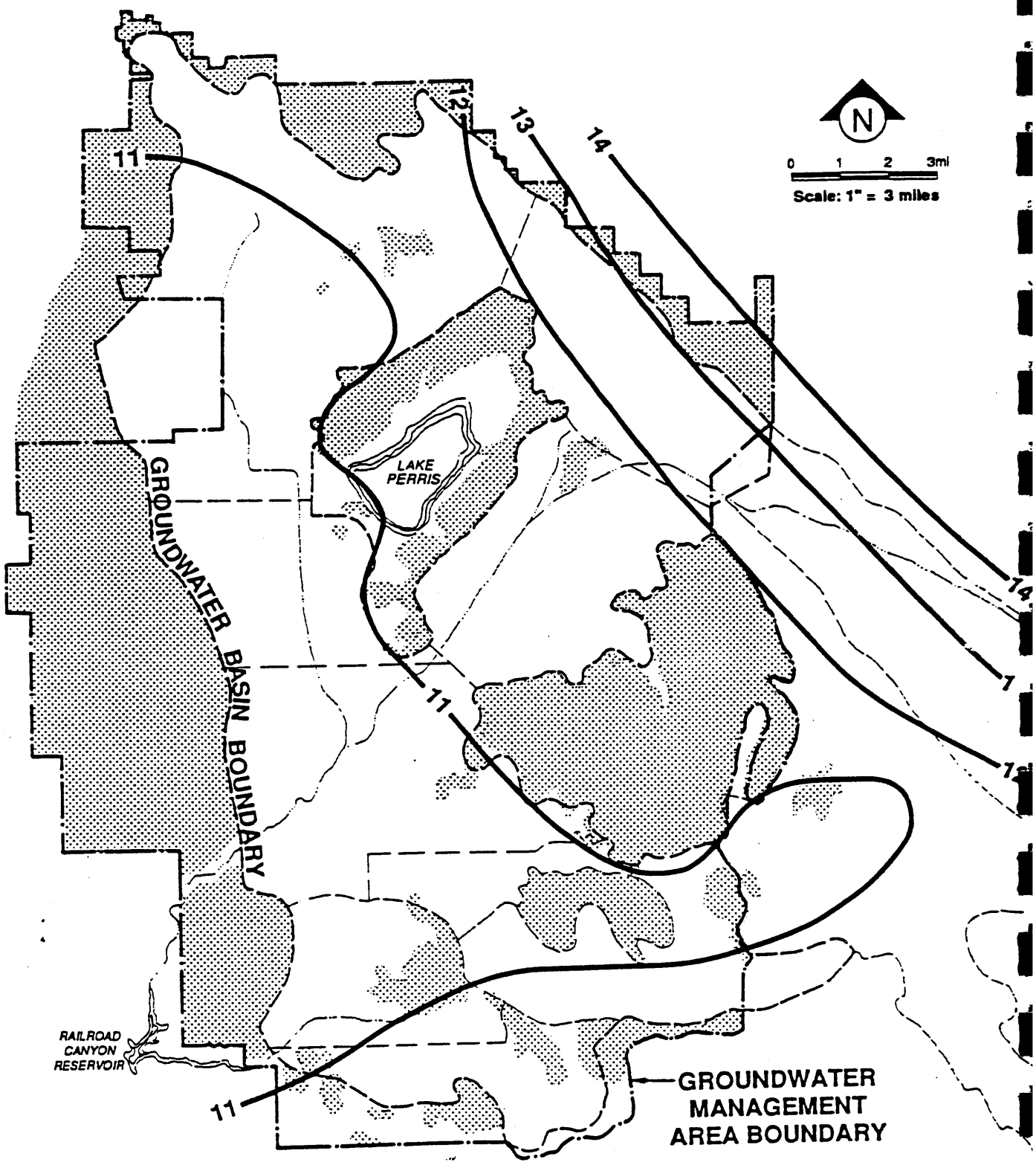

Figure 4-7
AVERAGE ANNUAL PRECIPITATION I
GROUNDWATER MANAGEMENT ARE

LEGEND:

NONWATER-BEARING PORTION

—11— EQUAL PRECIPITATION IN INCHES (Snowfall Converted to Equivalent Rainfall)

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REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

precipitation in the management area ranges between 10 to 12 inches per year. By contrast, the potential evapotranspiration in the management area is about 50 inches (California Department of Water Resources, 1978). Deep percolation of precipitation will occur in wet years, during periods of very high precipitation. In the management area, deep percolation of precipitation varies from about 400 acre-ft/yr in the Winchester subbasin, to a high of about 1,600 acre-ft year in the Lakeview subbasin. The long term deep percolation of precipitation for the management area is about 6,400 acre-ft/yr.

Deep Percolation of Applied Water. The deep percolation of applied water includes recharge from percolation ponds at municipal water plants, septic and irrigation return flows. Recharge from municipal wastewater plants, in order of magnitude, occurs in Perris South (from the Sun City and Perris reclamation plants), Perris North (from the Moreno Valley reclamation plant), and Winchester subbasins (from the Rancho Temecula reclamation plant). The annual recharge of reclaimed water in the management area is projected to be about 11,900 acre-ft/yr (Eastern Municipal Water District, 1993).

The deep percolation of irrigation ranges from about 1,300 acre-ft/yr in the Winchester subbasin, to 7,800 acre-ft/yr in the Perris North subbasin. The long term deep percolation of irrigation and septic tank returns for the management area is about 20,300 acre-ft/yr.

The deep percolation of applied water from reclamation plants, irrigation returns and septic tank disposal ranges from about 1,400 acre-ft/yr for the San Jacinto Lower Pressure subbasin, to about 13,600 acre-ft/yr for the Perris South subbasin.

Subsurface Inflow . Subsurface inflow along mountain boundaries is defined as the sum of subsurface inflows from the mountain boundaries plus runoff that percolates to groundwater along the mountain - aquifer contact. Subsurface inflow is projected to be about 2,800 acre-ft/yr.

Subtotal Inflow. The total inflow or recharge to the management area ranges from a low of 3,000 acre-ft/yr for the Winchester subbasin, to a high of about 19,500 acre-ft/yr for the Perris South subbasin. The total of all recharge into the management area is about 50,200 acre-ft/yr.

Outflow Components. Outflow from the management area consists of the following hydrologic components:

- subsurface outflow to areas outside the management area;
- groundwater production; and
- consumptive use from riparian vegetation.

Table 4-2 lists the average value for each of these recharge components for year 2000 land use conditions for each subbasin. These components are described below.

Subsurface Outflow. Subsurface outflow to areas outside the management area ranges from a low of zero for the Lakeview Menifee, Perris North and Perris South subbasins, to a high of about 1,200 acre-ft/yr for the Winchester subbasin. The total water lost to subsurface outflow is about 2,000 acre-ft/yr in the management area.

Groundwater Production. Groundwater production data was obtained for the period 1987 through 1991, the last five year period for which the State Water Resources Control Board (SWRCB) had compiled records of reported groundwater production. These data are listed in Table 4-3. Actual groundwater production is significantly larger because some groundwater producers do not report their groundwater production to the SWRCB. Groundwater production, while a hydrologic component, is omitted from the table because it is unknown. The safe yield estimate shown in Table 4-2 is based on total inflows minus non pumping outflows.

Losses to Riparian Vegetation. Losses to riparian vegetation are negligible. In the predevelopment past, uptake of groundwater by riparian vegetation was probably large, but has dropped to insignificance because of agricultural land development and lower groundwater levels.

Subtotal Outflow. The total outflow in the basin, from all sources, ranges from a low of 1,300 acre-ft/yr for the San Jacinto Lower Pressure subbasin, to a high of 4,600 acre-ft/yr for the Menifee subbasin. The total outflow for the management area is about 14,800 acre-ft/yr.

Volume of Groundwater in Storage. The volume of groundwater in storage was estimated from the Basin Planning Model simulations used in the 1993 Basin Plan. These estimates are listed in Table 4-2 and correspond to the year 2000. The volume of groundwater in storage is estimated as the product of the thickness of saturated sediments, times the specific yield, times the area of saturated sediments. The volume of groundwater in storage ranges from about 36,000

TABLE 4-3
HISTORICAL GROUNDWATER PRODUCTION

User	State Well ID	Reported Groundwater Production (acre-ft/yr) 1987	1988	1989	1990	1991
		Lakeview Subbasin Production				
Hammerschmidt	4S/2W 07J	750	750	750		
Motte	4S/2W 10C		600.3	792	653.4	428.1
Motte	4S/2W 09A	579	600.4	201	507.2	26.8
Nuevo Water Co.	4S/2W 18A	527	580.5	780.6	720	382.7
Nuevo Water Co.	4S/2W 18B	522.6	568.3	520	407	777.5
Nutriline	4S/2W 08Q	83	100.1	102.4	124.8	70
Nutriline	4S/2W 08K	53.7	120.6	102.8	120	130
Nutriline	4S/2W 08	361.6	1199.2	1166.9	1132.1	980
Verger	4S/2W 10B	724		620	600	510
Verger	4S/02W 10A	440		430	420	350
Total Annual Production for Lakeview Subbasin		4,041	4,519	5,466	4,685	3,655
		Perris North Subbasin Production				
E.G.M.W.C.	3S/3W 06N	13.8	12.5	77.6	1.1	0.3
EMWD	3S/3W 6D	6176	763	613.8	601.5	231.3
Knox	3S/3W 30Q	200				3.6
Schori	3S/3W 31Q			750		
UCR	3S/3W 21C	39.9	56.5	71.5	34.1	61.8
UCR	3S/3W 22D	266.5	325.5	181.4	276.3	266.8
UCR	3S/3W 21A	35.9	71.4	30.9	42.3	46
Warmington	3S/3W 21 F1		847		845	
Total Annual Production for Perris North Subbasin		6,732	2,076	1,725	1,800	610
		Perris South-I Subbasin Production				
Smith	4S/3W 16N	94.8				
Total Annual Production for Perris South-I Subbasin		95	0	0	0	0
		Perris South-II Subbasin Production				
Motte	5S/3W 11M	556	558	716	318	421.2
Underwood Farms	5S/3W 14P	375	365	365	365	350
Total Annual Production for Perris South-II Subbasin		931	923	1,081	683	771
		Perris South-III Subbasin Production				
Agri-Empire	5S/3W 13A	455	442	496	441	381
Agri-Empire	5S/3W 13Q	205	168	170	164	148
Agri-Empire	5S/3W 13A1					165
Total Annual Production for Perris South-III Subbasin		660	610	666	605	694
		San Jacinto Lower Pressure Subbasin Production				
Agri-Empire	4S/2W 35D1	576		638	293	204
H. Welch	3S/2W 33R1	20.2				
Hill & Sooy	3S/2W 28Q	166	208	214	211	172
Total Annual Production for San Jacinto Lower Pressure Subbasin		762	208	852	504	376
Total Reported Groundwater Production West San Jacinto Groundwater Basin		13,221	8,336	9,790	8,277	6,106

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acre-ft for the Winchester subbasin, to about 380,000 acre-ft in the San Jacinto Lower Pressure subbasin. The total groundwater in storage in the management area is about 1,130,000 acre-ft.

The storage capacity of these subbasins is also shown in Table 4-2. The storage capacity is equal to the volume of groundwater that could be stored in the basin with a minimum 50 feet depth to water. The storage capacity of groundwater in storage ranges from about 41,000 acre-ft for the Winchester subbasin, to about 515,000 acre-ft for the Lakeview subbasin. The total storage capacity in the management area is about 1,800,000 acre-ft

Safe Yield. Two estimates of the safe yield are presented in Table 4-2. The natural safe yield of the groundwater basins is assumed equal to the net inflow and is numerically equal to the long term average inflow, minus subsurface outflow from the management area, minus the average annual percolation of reclaimed water. The natural safe yield ranges from a low of 1,600 acre-ft/yr for the Winchester subbasin, to a high of about 13,700 acre-ft/yr for the Perris North subbasin. The natural safe yield for the management area is about 36,200 acre-ft. If the percolation of reclaimed water is included in the yield, then the safe yield will range from 1,800 acre-ft/yr for Winchester subbasin, to 19,500 acre-ft/yr for the Perris North subbasin. The safe yield of the management area is about 48,100 acre-ft/yr.

GROUNDWATER QUALITY

The water quality trends in the West San Jacinto Groundwater Basin are typical of the arid southwest. There are three principle sources of water quality degradation in operation in the management area. Naturally occurring brackish groundwater occurs in the vicinity of Salt Creek in the Menifee and Winchester subbasins; and in the Perris South-II subbasin in the vicinity of San Jacinto Creek. Groundwater production patterns in these areas have caused the brackish groundwater to spread out and thus affect larger areas.

The second principle cause of water quality degradation is irrigated agriculture. The mineral content in irrigation return flows to groundwater is three to four times the mineral content of the irrigation source. The irrigation returns degrade the groundwater. If the groundwater is subsequently reused, the mineral content of the irrigation returns are further increased causing additional groundwater degradation. Groundwater will continuously degrade unless additional sources of high quality recharge are introduced to the basin.

Finally, elevated boron and fluoride levels in groundwater have been observed near faults, in particular near the Casa Loma and San Jacinto faults. Boron, fluoride and elevated groundwater temperatures are common near faults. The area degraded by these contaminants is near the Casa Loma and San Jacinto faults.

Groundwater quality descriptions are presented below for each subbasin. These descriptions are based on all groundwater quality data currently available for the management area. Most of the discussion is based on the groundwater quality descriptions developed by the DWR in *Water Resources Evaluation of the San Jacinto Area* (California Department of Water Resources, 1978). With the exception of the Menifee-I, Menifee-II and Winchester subbasins, very little new water quality data has been collected since the DWR prepared the above-mentioned report. Data collected after 1978, including a recent round of water quality sampling by the United States Geological Survey (USGS), were reviewed in detail and, where appropriate, modifications to the DWR's descriptions were developed and included herein.

The water quality discussion presented herein is limited to general minerals, nitrate and chloride due to the lack of data on heavy metals, organics and radionuclides. An inventory of the available water quality data at wells is included in Appendix B. The available water quality data base contains water quality data for about 300 wells. The average period of record for these wells is about 5 years, with 62 percent of the wells having only one water quality sample. On the average, about half of the water quality data is from before 1980 and about 72 percent before 1990. Most of the recent data was obtained from wells in the Menifee subbasins as part of EMWD's Menifee desalter studies, and groundwater quality sampling surveys by the USGS. It should be emphasized that there is practically no information on heavy metals, organics or radionuclides.

New groundwater quality data will need to be collected and a new water quality characterization of the West San Jacinto Groundwater Basin will need to be prepared in the implementation of the groundwater management plan. The need for new data will become obvious in the discussion of Sections 7 and 8. A plan to obtain these data has been incorporated into the management plan described in Section 8.

Perris North Subbasin

Figure 4-8 shows the distribution of TDS in the management area as interpreted by the DWR (DWR 1978). TDS, nitrate and the general inorganic chemistry for the Perris North subbasin is shown in Figure 4-9. Figure 4-9 is based on all available data and corresponds approximately to 1993 conditions. In the Perris North subbasin, TDS concentrations generally range from about 300 mg/L to 600 mg/L with some wells exceeding 800 mg/L. The chemical character of its water is mostly sodium chloride, probably because of the extensive irrigated agriculture. Evapotranspiration and the frequent application of irrigation water produce changes in the relative concentrations of the mineral constituents that leave more sodium and chloride in solution. Recycling of this water further concentrates these ions. The only source of dilution is the deep percolation of precipitation and stormflow which are small compared to total recharge in the subbasin (see Table 4-2).

Nitrate concentrations range from about 1 to 12 mg/L (as nitrogen) with most values between 4 mg/L to 9 mg/L. Nitrate concentrations have increased over the years as a result of fertilization practices in the valley. Figures 4-10, 4-11, and 4-12 show TDS, nitrate and chloride trends in the Perris North subbasin. Figure 4-11 suggests an increasing trend of nitrate concentration.

Most of the water ranges from soft to moderately hard. Fluoride and boron concentrations are relatively high in certain wells in the area, possibly indicating the presence of unmapped faults. For human consumption, water from some wells in the area may not meet Department of Health Services standards for nitrate and fluoride concentrations.

Perris South Subbasins

Figure 4-13 illustrates the TDS, nitrate and general inorganic chemistry of the Perris South I and Lakeview subbasins and Figure 4-14 shows the same interpretation for the Perris South II and Perris South III subbasins. Figures 4-13 and 4-14 are based on all available data and correspond approximately to 1993 conditions. The variations in TDS and nitrate concentrations in the Perris South subbasins are listed below (mg/L).

Subbasin	TDS	Nitrate (as N)
Perris South-I	500 to 1300	0.0 to 7.2
Perris South-II	640 to 14,000	0.0 to 9.0
Perris South-III	400 to 3,300	5.0 to 31

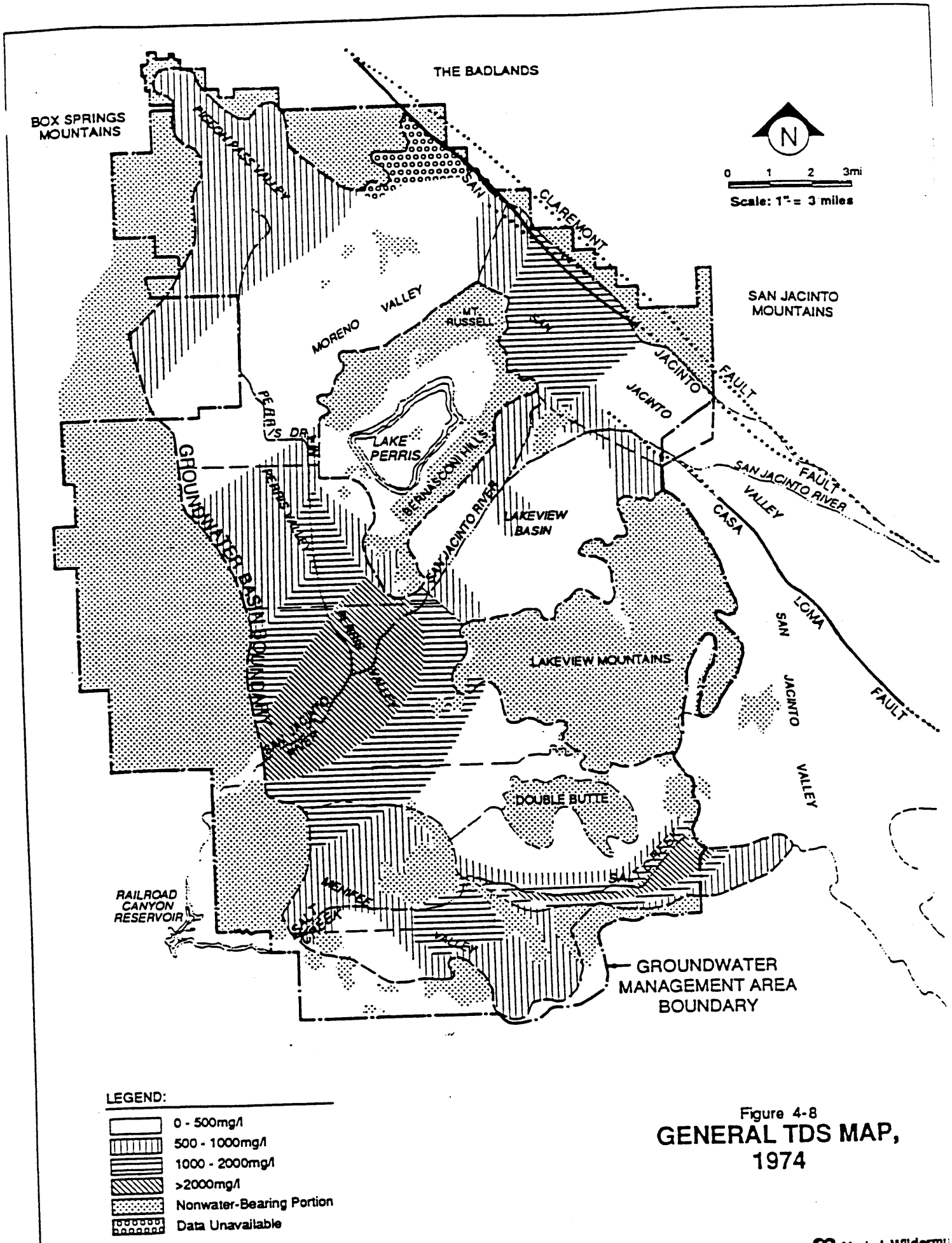

Figure 4-8
GENERAL TDS MAP, 1974

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Water Resources Engin

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

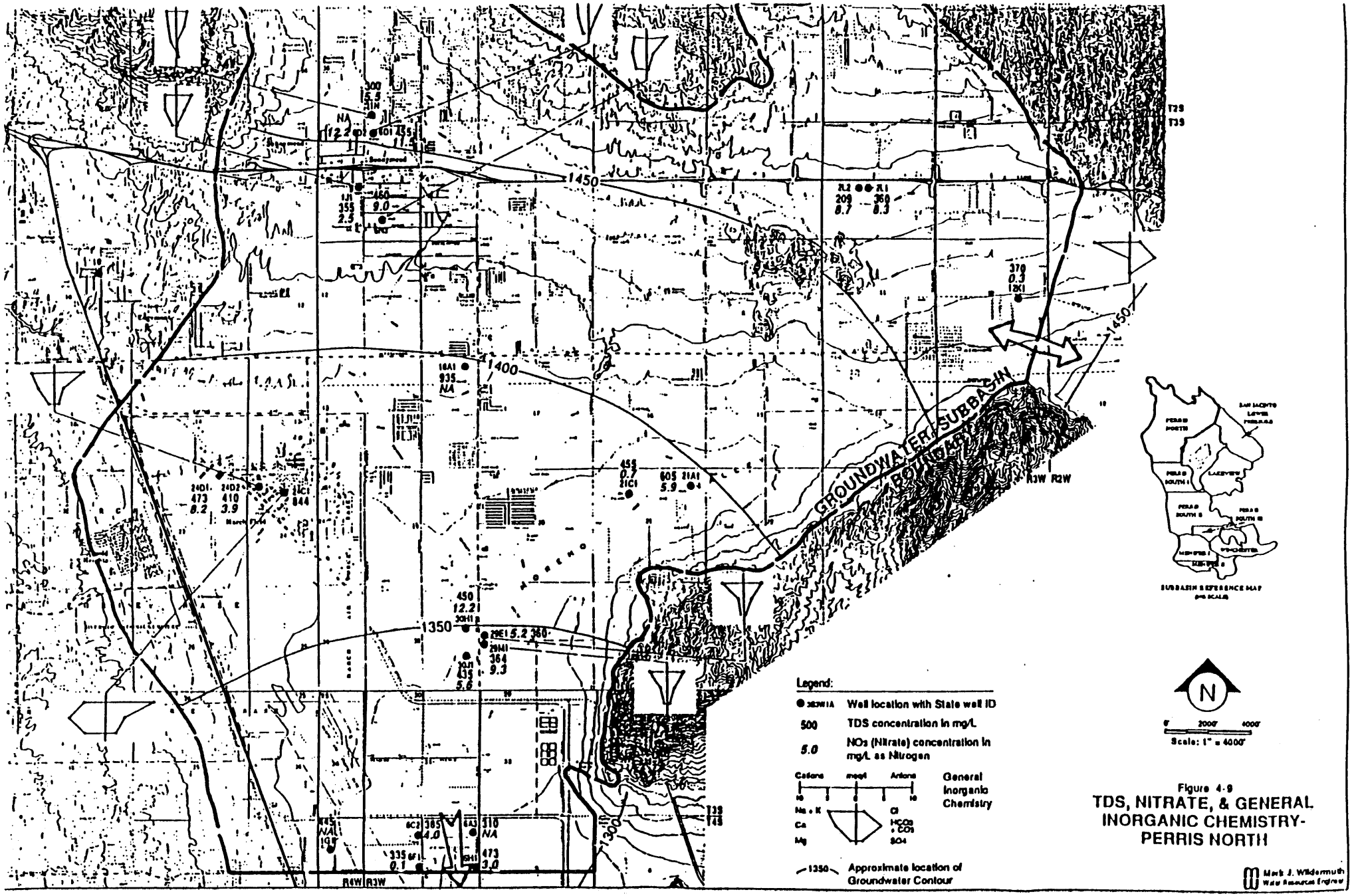
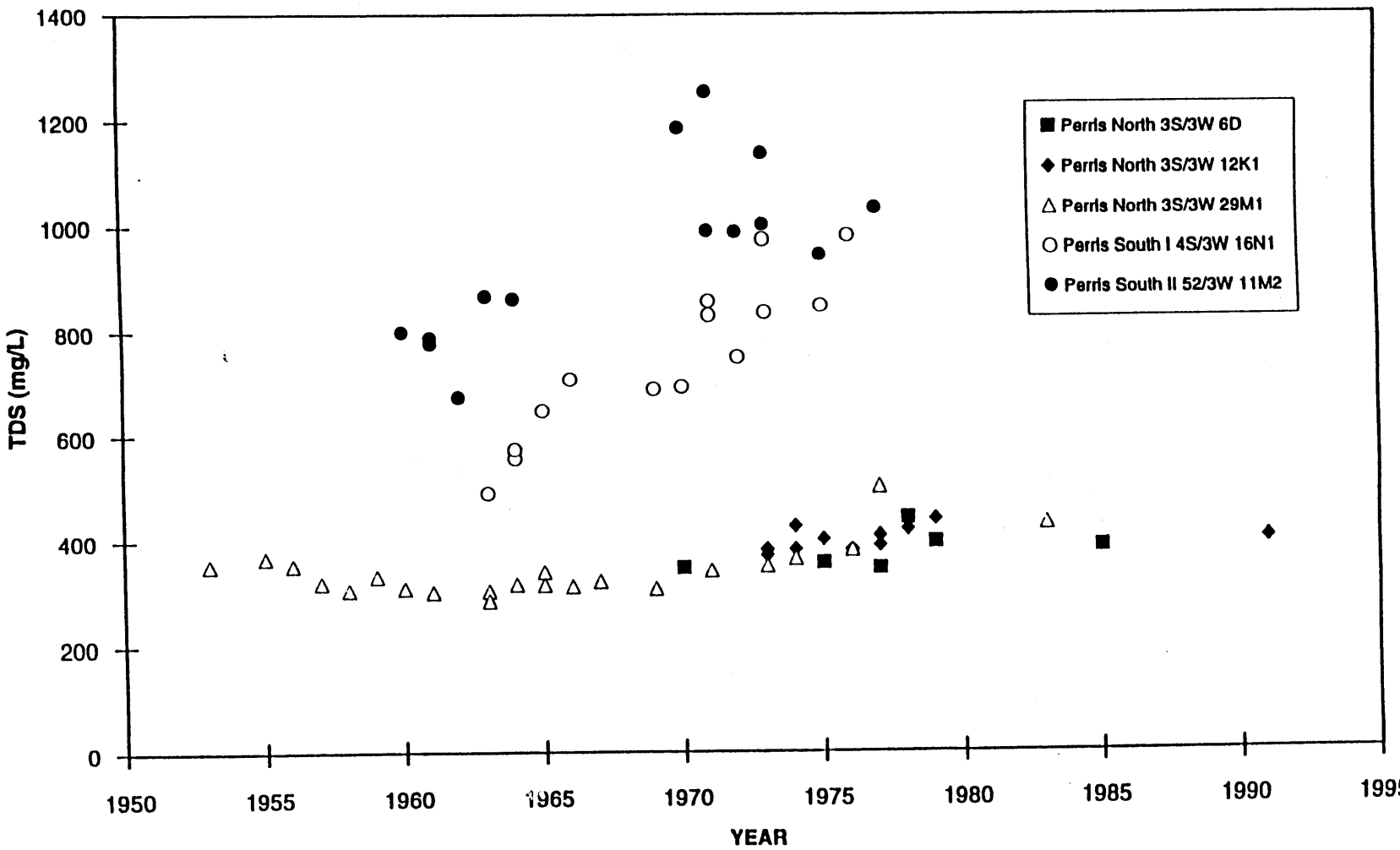


Figure 4-9
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-PERRIS NORTH

FIGURE 4-10 TDS CONCENTRATION IN PERRIS NORTH AND SOUTH BASINS



TDS Plot Perris N&S
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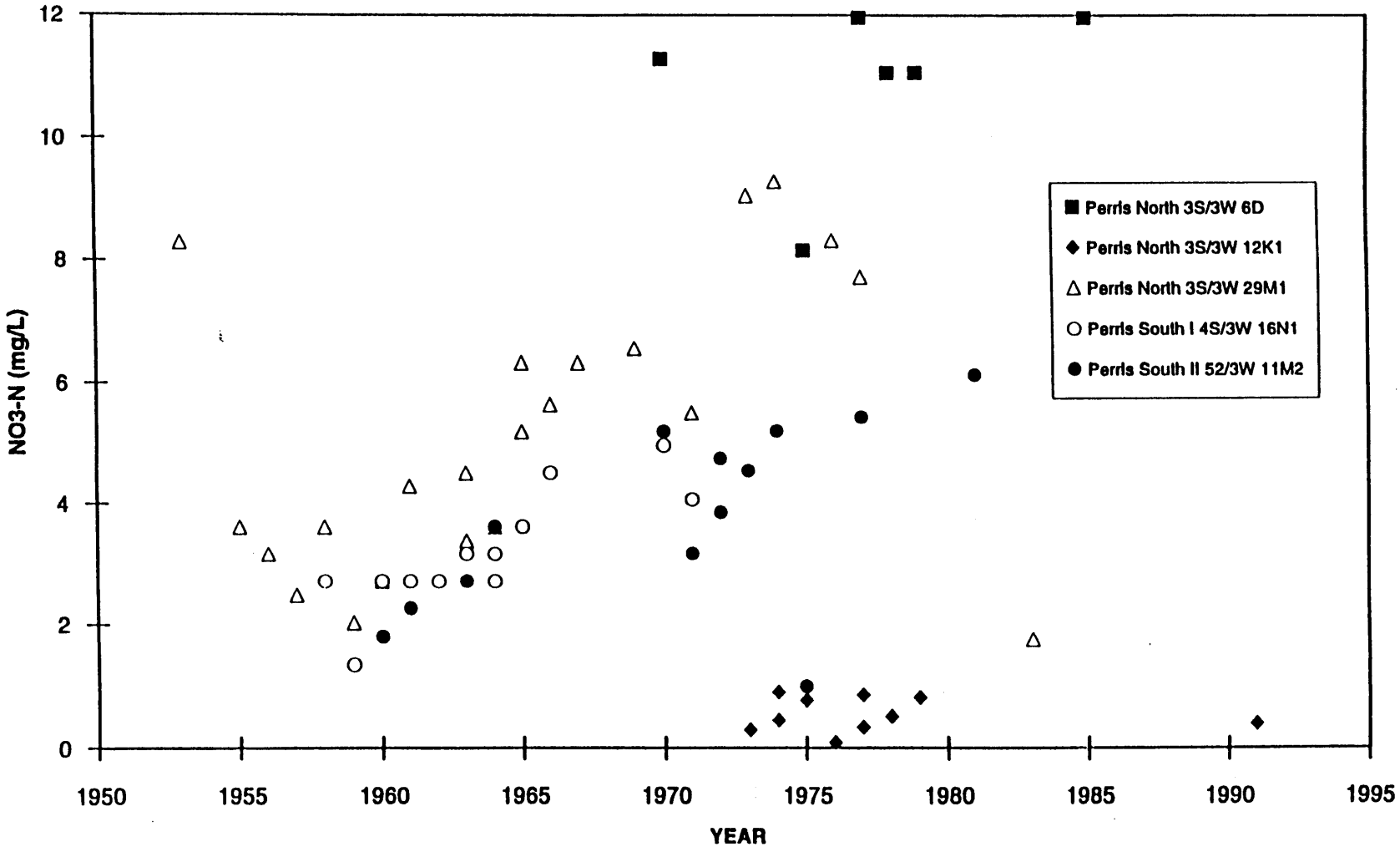
FIGURE 4-11 NITRATE-N CONCENTRATION PERRIS NORTH AND SOUTH BASINS



NO3 Plot Perris N&S
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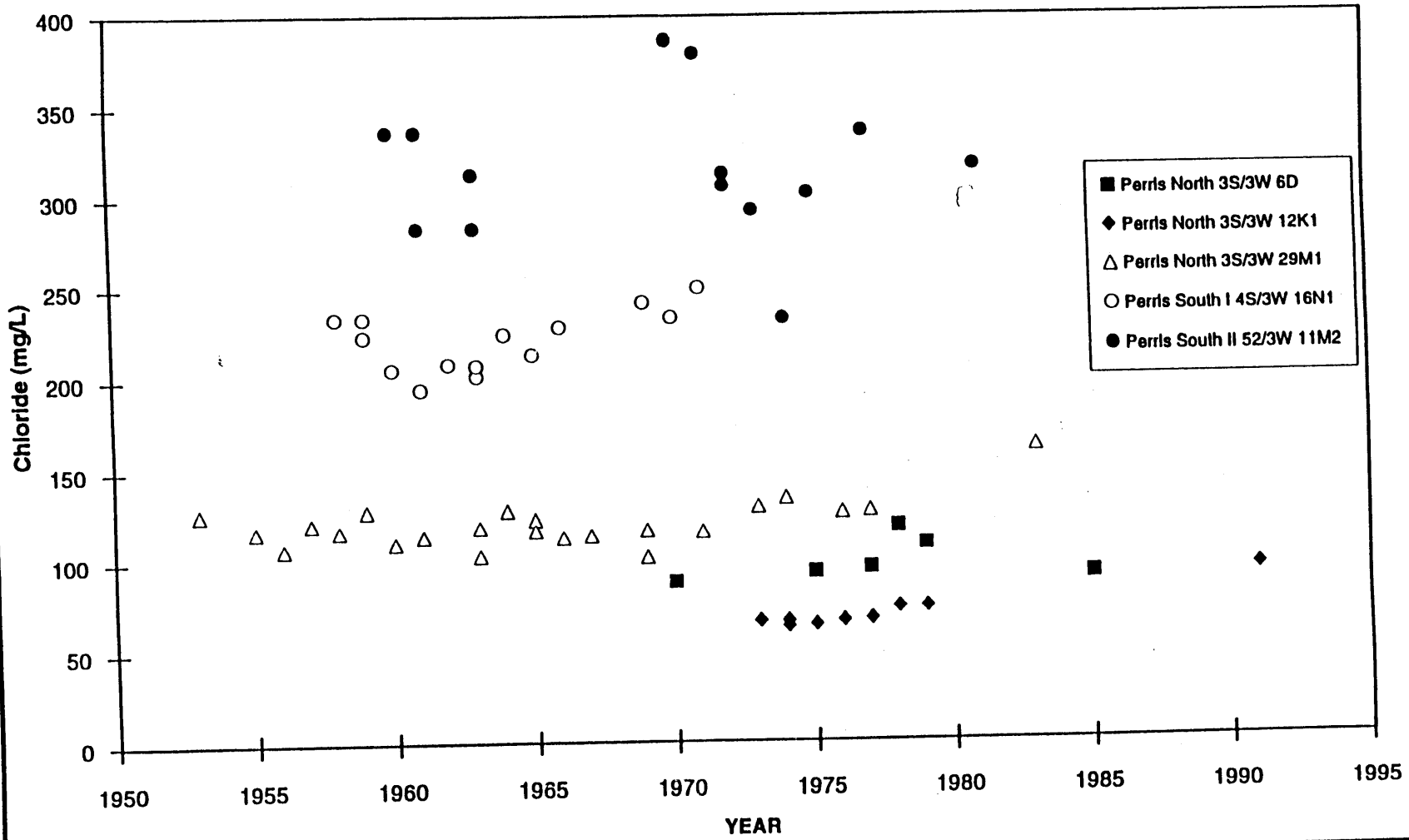
FIGURE 4-12 CHLORIDE CONCENTRATION PERRIS NORTH AND SOUTH BASINS



Chloride Plot Perris N&S
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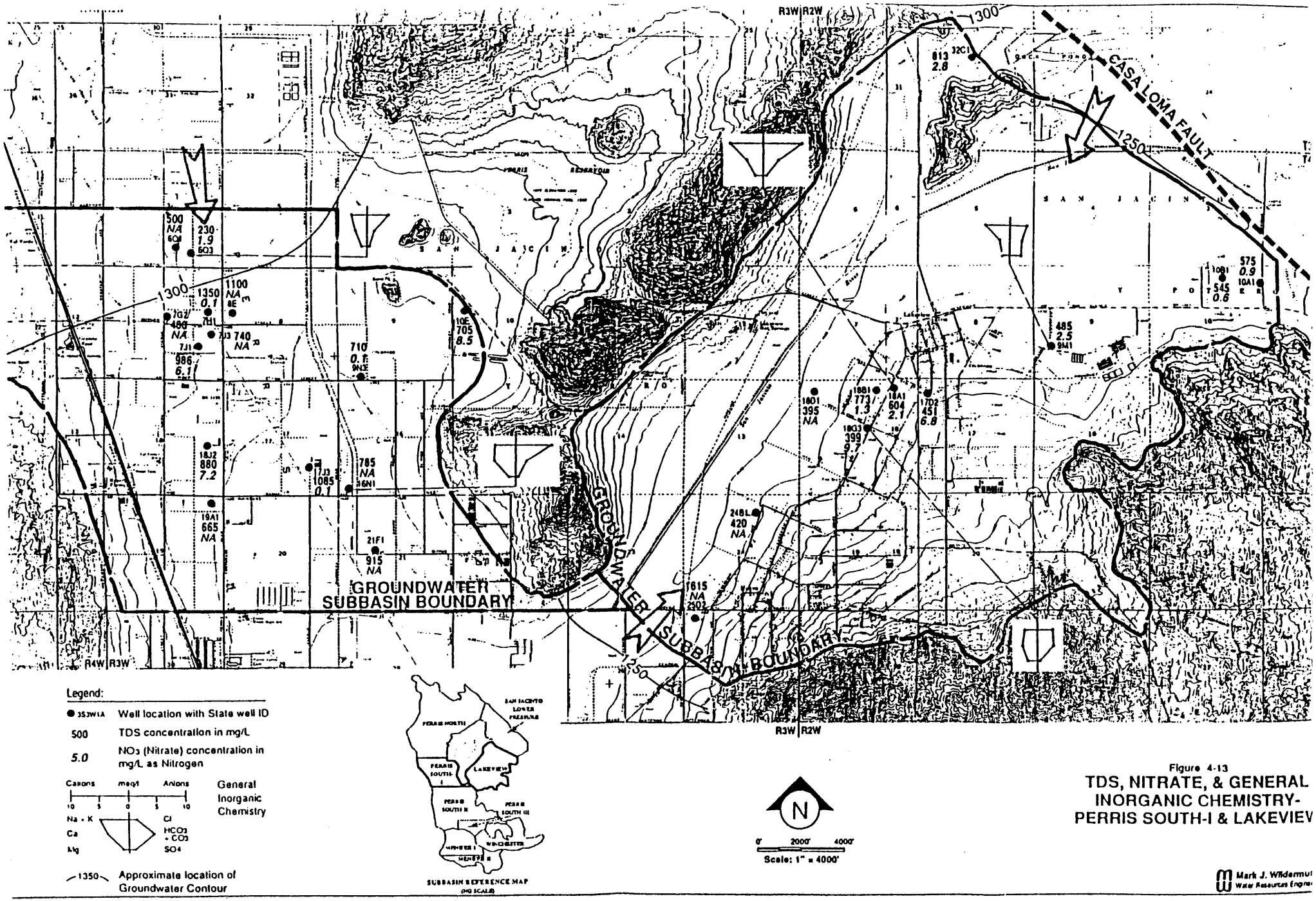


Figure 4-13
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-PERRIS SOUTH-I & LAKEVIEW

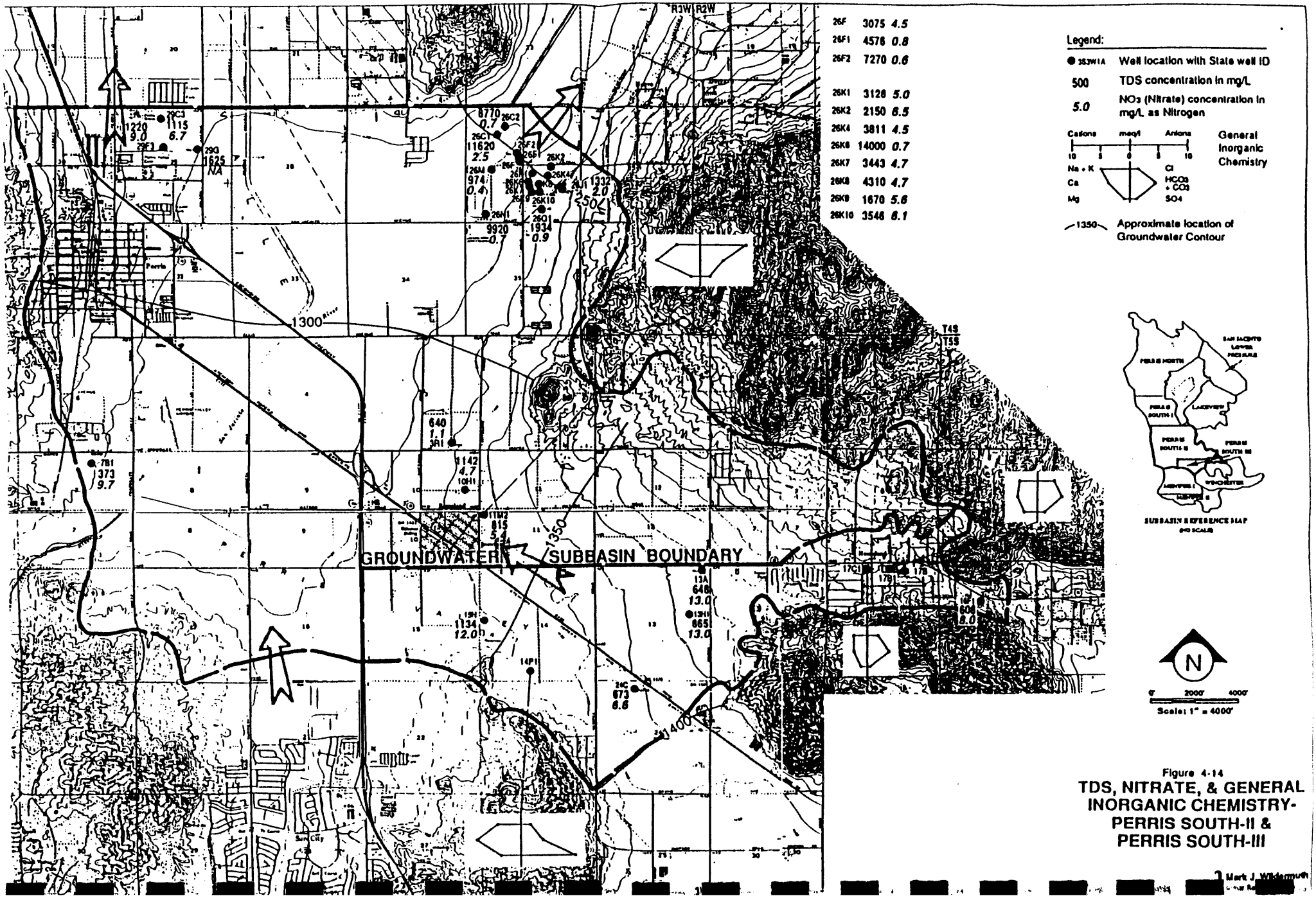


Figure 4-14
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-PERRIS SOUTH-II & PERRIS SOUTH-III

Mark J. Wildermuth

The poorest quality water is found near the San Jacinto River in the Perris South-II subbasin. This brackish water is believed to be the result of the large evapotranspiration losses incurred because of the high water table that existed in the past. As wells were abandoned because of this brackish water, pumping increased in the areas of better quality to the north and south. As a result, brackish water has spread out toward these areas. Thus, the TDS concentration of the groundwater has increased as water levels have declined in the areas north and south of the river. Figures 4-10, 4-11, and 4-12 illustrate TDS, nitrate and chloride trends in the Perris South subbasins. Figure 4-10 shows this increase in TDS concentration. The Ski Land area has anomalously high TDS concentrations ranging from 1,700 mg/L to 14,000 mg/L.

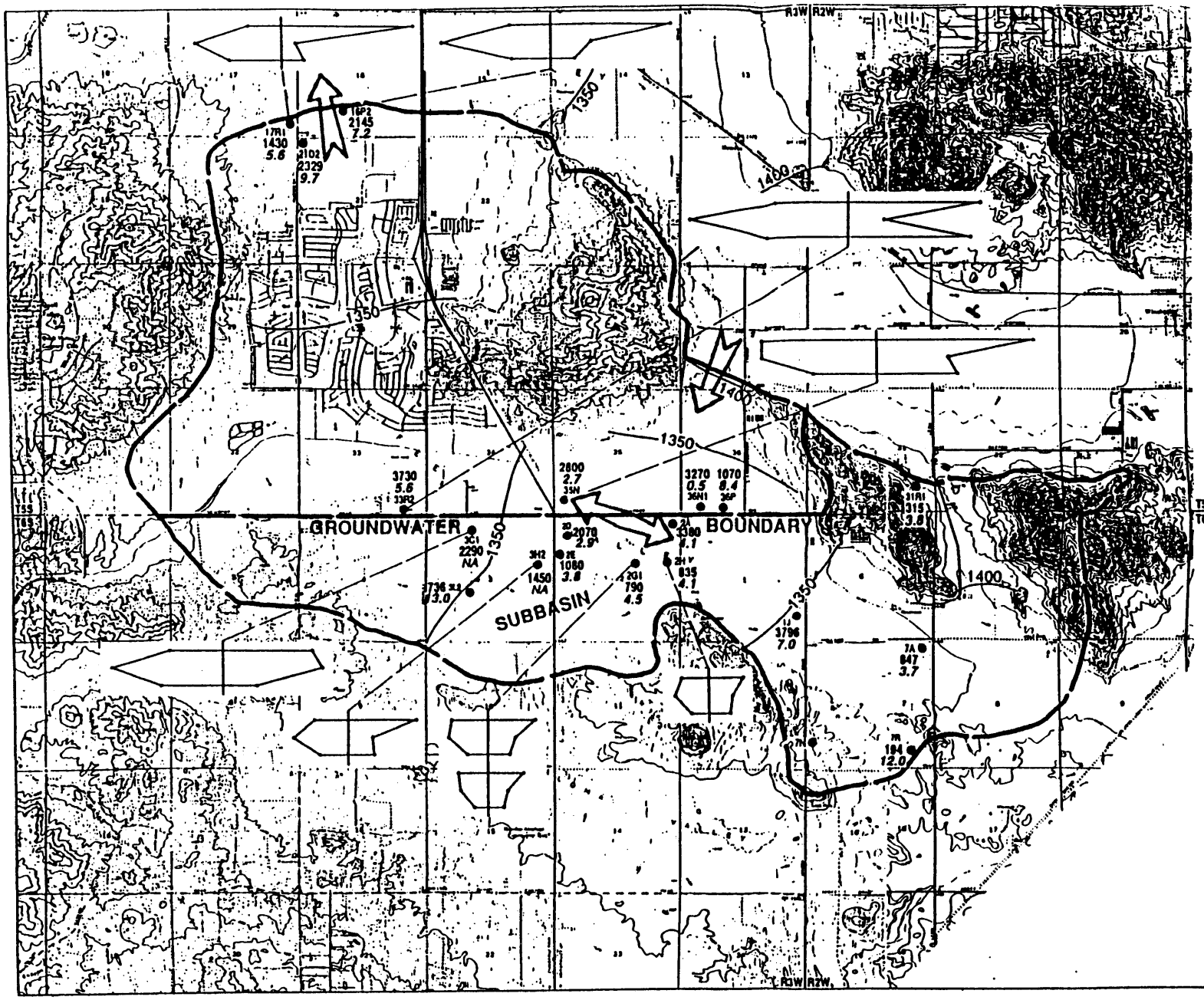
Menifee Subbasins

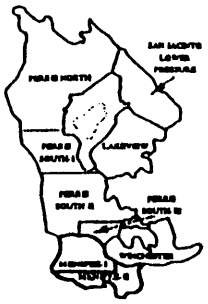
Figure 4-15 illustrates the TDS, nitrate and general inorganic chemistry of the Menifee-I and Menifee-II subbasins. Figure 4-15 is based on all available data and corresponds approximately to 1993 conditions.

Groundwater flow between Menifee and the adjacent subbasins is negligible. The volume of groundwater in storage for Menifee-I and Menifee-II is relatively small and is estimated at about 56,000 acre-ft (Table 4-2). Groundwater produced in these subbasins was, and is, used for agriculture and landscape irrigation. Returns from irrigation have contributed to increased mineral concentrations in these subbasins.

Under natural conditions, groundwater flowed toward Salt Creek from all directions and from Salt Creek westward, where high groundwater caused large evapotranspiration losses and concurrent salt buildup. In time, brackish water developed in these areas and, under normal conditions, remained close to the creek. TDS concentrations throughout the basin ranged from 300 to 1,500 mg/L in 1974, and have increased to range from 800 to 3,700 mg/L.

Most groundwater in the Menifee-I and Menifee-II subbasins cannot be used for domestic supply without demineralization or blending with imported water. Agricultural usage is somewhat limited due to high chloride and sodium concentrations.





Legend:

- 3S3W1A — Well location with State well ID
- 500 — TDS concentration in mg/L
- 5.0 — NO_3 (Nitrate) concentration in mg/L as Nitrogen
- General Inorganic Chemistry (Cations: Na + K, Ca, Mg; Anions: Cl, HCO_3 + CO_3, SO_4; meq/l)
- 1350 — Approximate location of Groundwater Contour

N

0 2000' 4000'

Scale: 1" = 4000'

Figure 4-15

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- MENIFEE-I & MENIFEE-II

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Water Resources Engineer

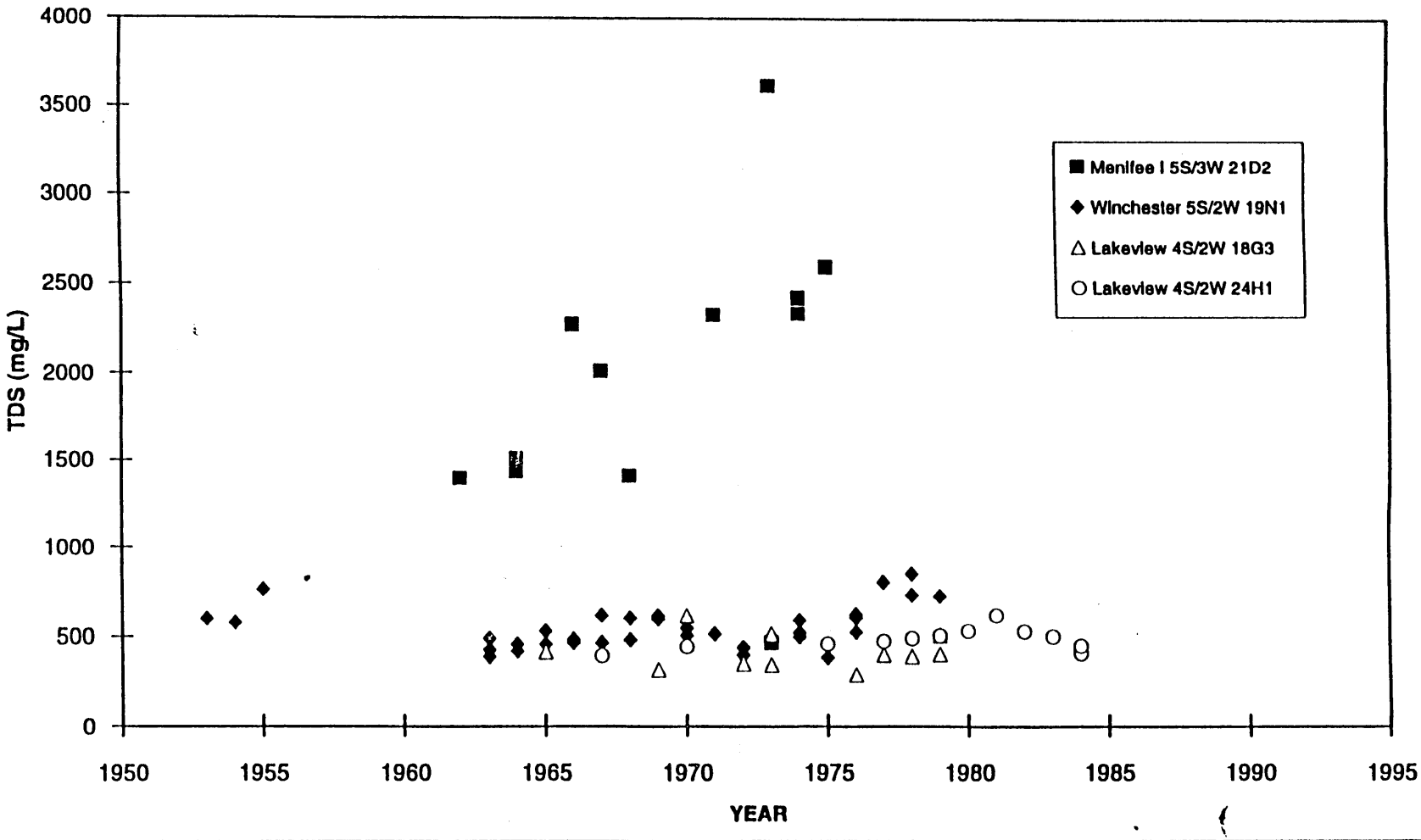
Lakeview Subbasin

Figure 4-13 illustrates the TDS, nitrate and general inorganic chemistry of the Lakeview subbasin. Figure 4-13 is based on all available data and corresponds approximately to 1993 conditions. Figures 4-16, 4-17 and 4-18 contain time histories for two wells in the Lakeview subbasin covering the period of 1957 to 1989.

The principle sources of groundwater in this basin are underflow from the San Jacinto Lower Pressure, Perris South I, Perris South II subbasins, stormflow percolation in San Jacinto Creek, and runoff from the Lakeview Mountains and Bernasconi Hills. Groundwater quality under natural conditions has been altered by a groundwater level drop of about 200 feet that has changed the direction of flow of groundwater. Groundwater flows toward Lakeview from all sides. Groundwater on the northwest and southeast sides of the basin has TDS concentrations of below 500 mg/L as a direct result of the recharge of the Bernasconi Hills and Lakeview Mountains, respectively. Brackish groundwater is entering from the Perris South-II subbasin because of lowered groundwater levels near Lakeview. The most conspicuous constituents of the brackish water are sodium and chloride. TDS concentrations range from 400 to 1,600 mg/L, with more typical values ranging from 400 to 600 mg/L. Nitrates range from 1 to 9 mg/L as nitrogen, with typical values less than 6 mg/L. Most of the groundwater in the basin is sodium chloride in character. The Casa Loma fault, which forms the eastern boundary of the basin, affects the quality of water in that area. Both boron and fluoride concentrations are relatively high near the fault and in a few other specific areas of the basin. Chloride is generally high and most of the groundwater is moderately hard.

With the exception of some instances of elevated fluoride, groundwater in the Lakeview subbasin is suitable for domestic and municipal supply. Agricultural usage is somewhat limited due to high boron and chloride concentrations.

FIGURE 4-16 TDS CONCENTRATION IN MENIFEE, WINCHESTER, LAKEVIEW BASINS



TDS Plot Men-Win-Lak
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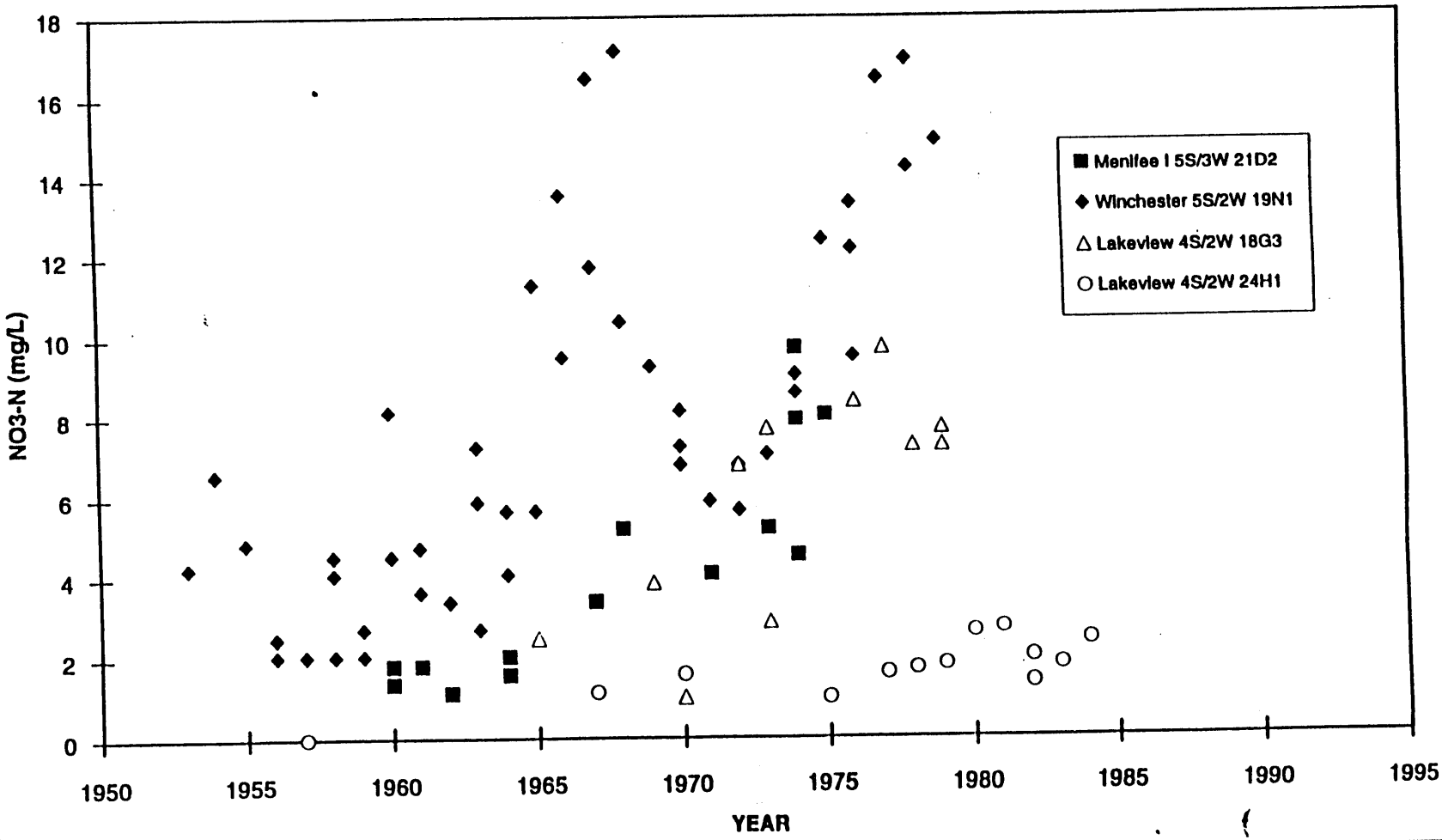
Water Resources Engineer

FIGURE 4-17 NITRATE-N CONCENTRATION MENIFEE I, WINCHESTER, AND LAKEVIEW BASINS



NO3 Plot Men-Win-Lak
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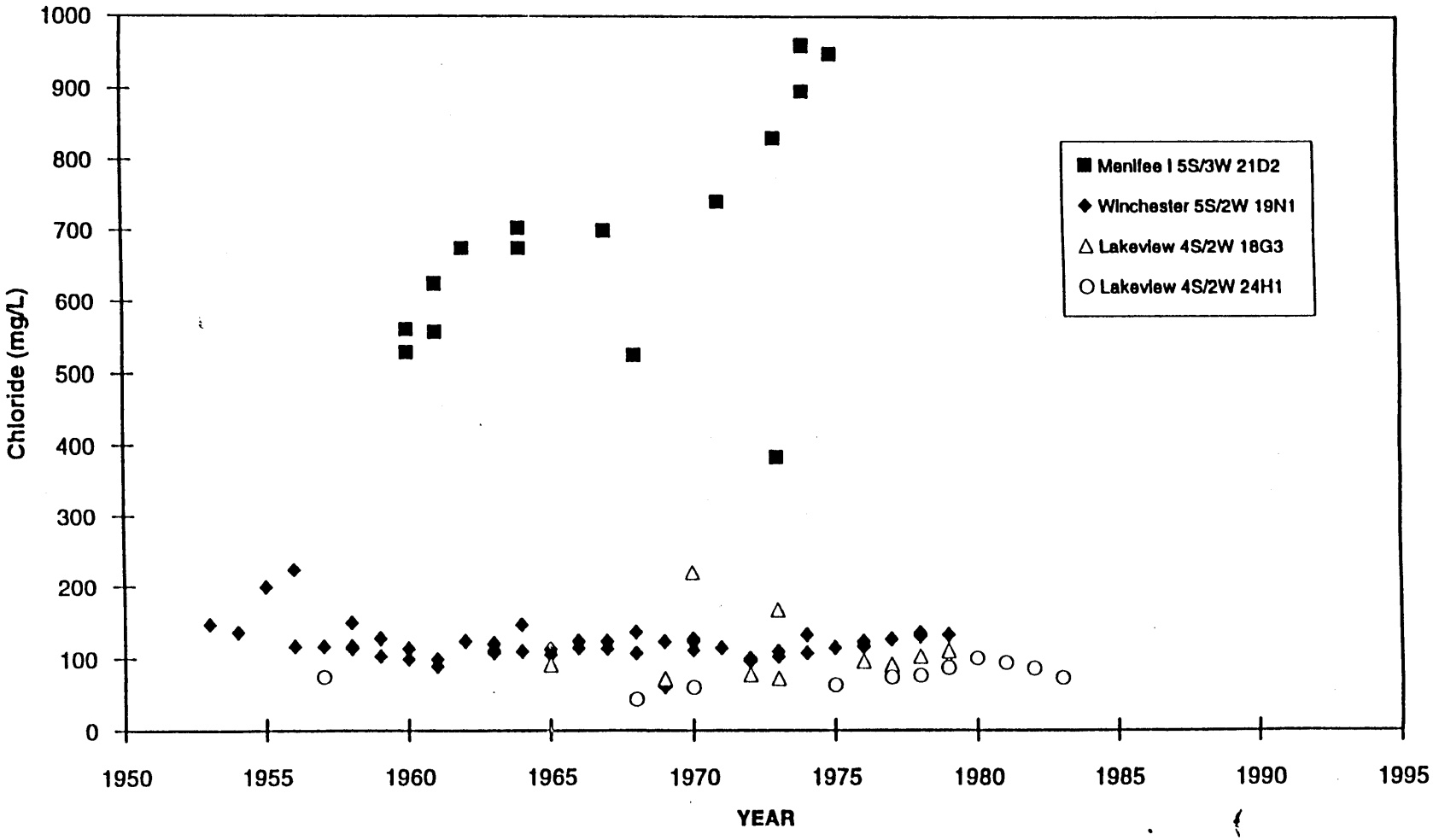
Water Resources Engineer

FIGURE 4-18 CHLORIDE CONCENTRATION IN MENIFEE, WINCHESTER, AND LAKEVIEW BASINS



Chloride Plot Men-Win-Lak
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Water Resource' 'gineer

Winchester Subbasin

Figure 4-19 illustrates the TDS, nitrate and general inorganic chemistry of the Winchester subbasin. Figure 4-19 is based on all available data and corresponds approximately to 1993 conditions. Winchester is the smallest of the groundwater basins, with about 36,000 acre-ft in storage and capacity of about 41,000 acre-ft. TDS concentrations range from 700 to 6,400 mg/L, with more typical values ranging from 1,000 to 3,000 mg/L. Nitrates range from 1 to 51 mg/L as nitrogen, with typical values ranging from 2 to 12 mg/L. TDS mapping in Figure 4-8 (California Department of Water Resources, 1978) indicates that brackish groundwater occurs in a half-mile-wide strip along the entire length of Salt Creek. This high TDS water is probably the result of evaporite deposits caused by past high-water-table conditions.

Under natural conditions, the primary source of recharge in the Winchester subbasin was subsurface inflow from the Hemet subbasin. The TDS in the subsurface inflow from the Hemet subbasin ranged from 500 to 1,000 mg/L. Currently, the Winchester subbasin flows into the Hemet subbasin causing groundwater degradation in that basin.

TDS, hardness and, occasionally, nitrate limit the use of Winchester groundwater for domestic purposes. Some groundwater in the Winchester subbasin cannot be used for municipal supply without demineralization. Agricultural usage is somewhat limited due to high boron and chloride concentrations.

San Jacinto Lower Pressure Subbasin

Figure 4-20 illustrates the TDS, nitrate and general inorganic chemistry of the San Jacinto Lower Pressure subbasin. Figure 4-20 is based on all available data and corresponds approximately to 1993 conditions. Water quality time histories could not be developed for this subbasin due to lack of data.

TDS concentrations in groundwater typically range from 500 to 1,500 mg/L. Nitrates range from near zero to 33 mg/L as nitrogen, with typical values less than 3 mg/L. Although data in the northwestern part of the subbasin are limited, the faults in the area appear to affect nearby groundwater because high boron and fluoride concentrations are found there.

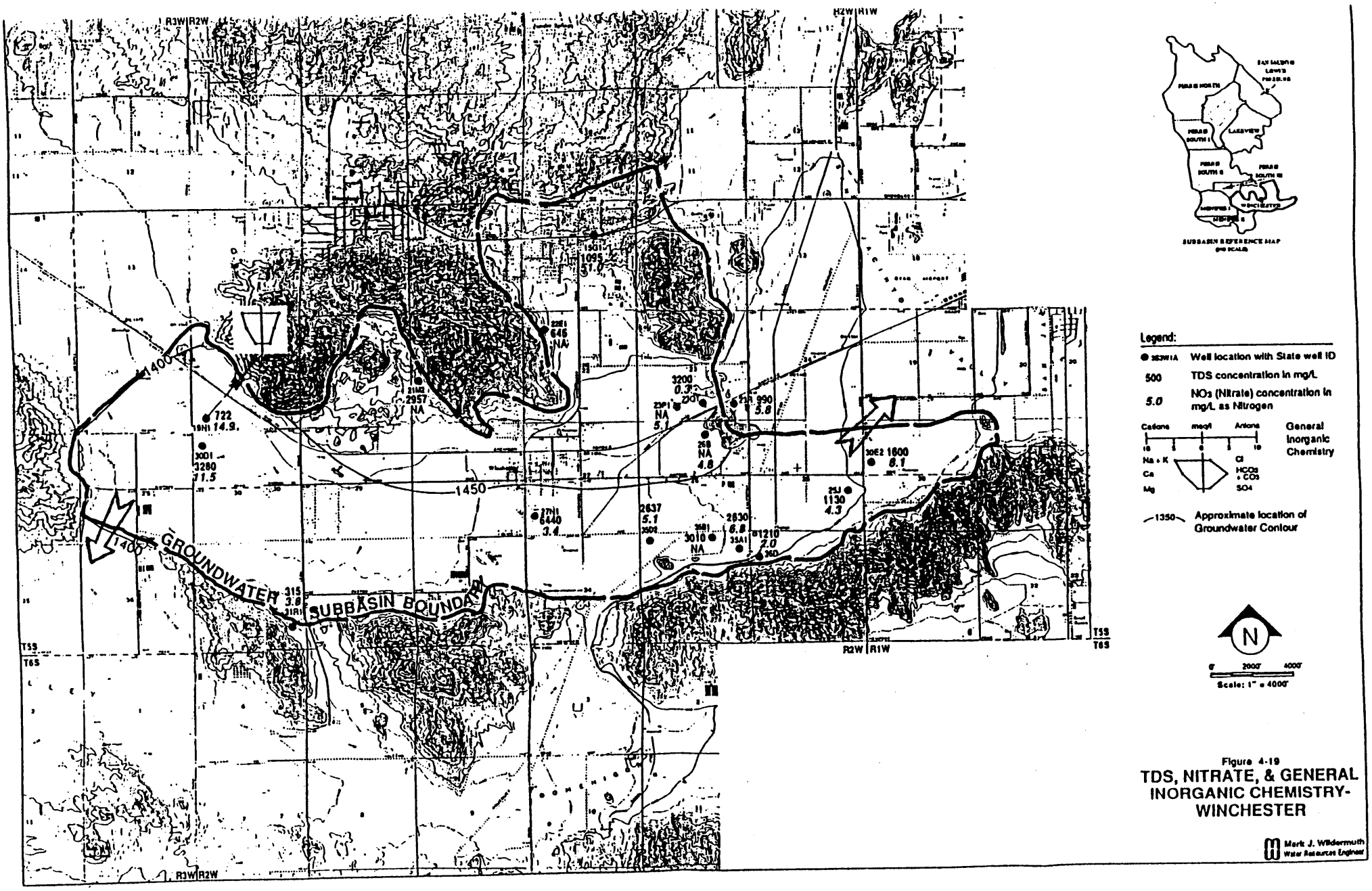

Figure 4-19
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-WINCHESTER

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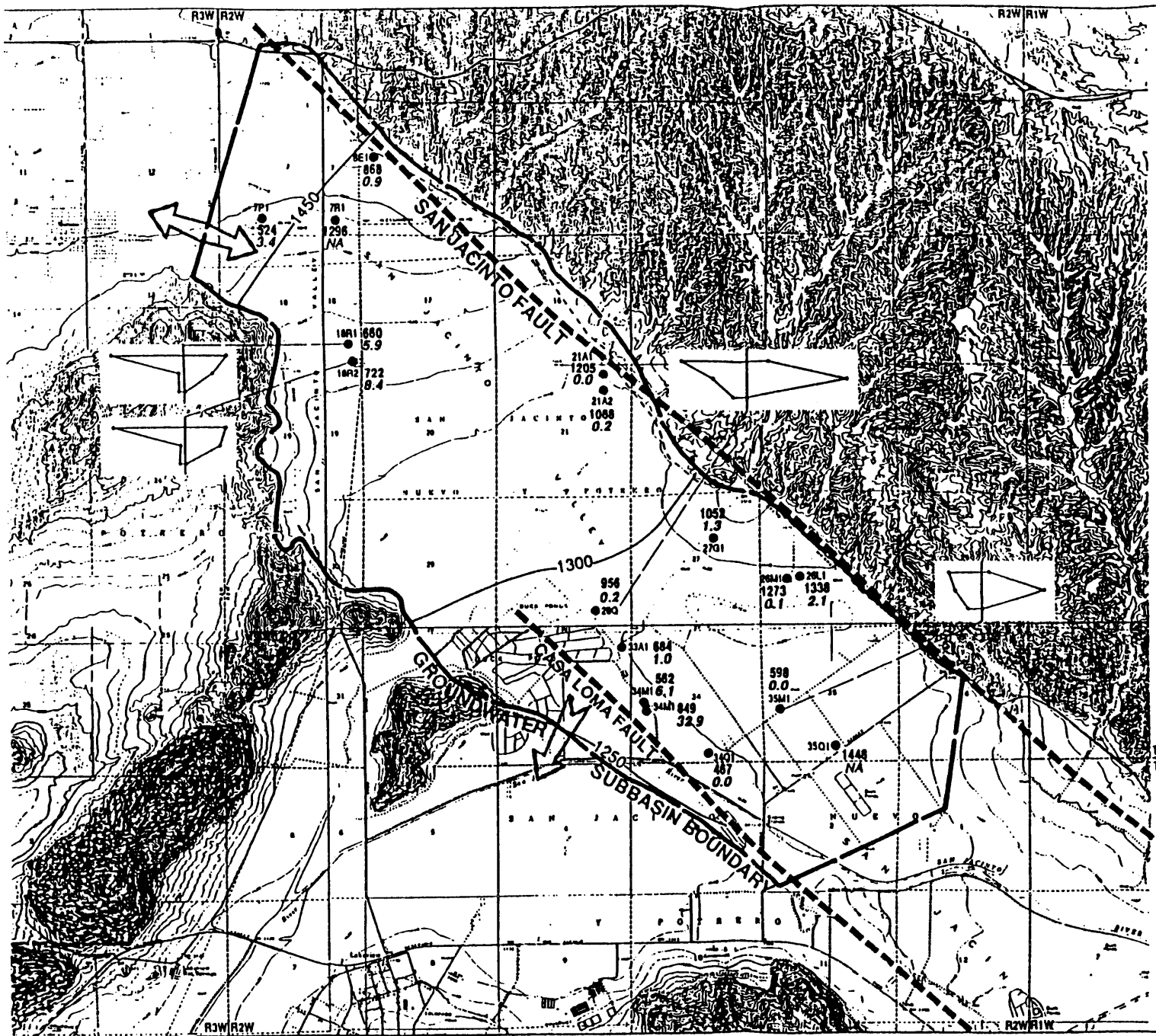
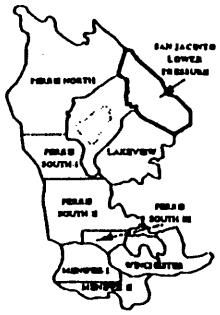
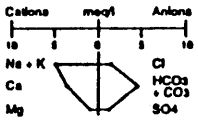




Legend:

- ● 3S3W11A — Well location with State well ID
- 500 — TDS concentration in mg/L
- *5.0* — NO_3 (Nitrate) concentration in mg/L as Nitrogen



General Inorganic Chemistry

1350 — Approximate location of Groundwater Contour

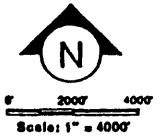


Figure 4-20

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- SAN JACINTO LOWER PRESSURE

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FUTURE GROUNDWATER QUALITY

Future projections of groundwater quality in the West San Jacinto Groundwater basin were prepared by SAWPA as part of the *Nitrogen and TDS Studies, Santa Ana River Watershed* (James M. Montgomery, 1989). These studies developed future projections of TDS and nitrate by subbasin for the period 1990 through 2005. These estimates, however, are based on a model that:

- has not been calibrated for TDS or nitrate;
- each subbasin is represented by only one node and thus the resolution of the analysis is crude; and
- future water supply and wastewater plans that were used in these studies are not representative of the future.

Therefore, the results are questionable and not of much value as a management tool for the West San Jacinto Groundwater Basin.

There is a need for a planning tool to estimate the groundwater level and quality response to groundwater management practices. The planning tool would consist of groundwater flow and simulation models similar to those models that were developed and that are in current use to develop the Chino Basin Water Resources Management Plan (Montgomery Watson & Wildermuth, Mark J., 1992; Montgomery Watson & Wildermuth, Mark J., 1993).

SECTION 5

SECTION 5
FUTURE WATER DEMANDS AND WASTEWATER FLOWS

WATER DEMANDS AND SOURCES OF SUPPLY

Projected Demands

Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 5-1 and shown graphically in Figure 5-1. These estimates are based on land use and population projections and projected water use rates. The projections in Table 5-1 were developed by the planning staff of EMWD and represent an update of the water demand projections developed for the 1990 Water Facilities Master Plan (Black & Veatch, James M. Montgomery, Inc., 1990). Municipal demands in the West San Jacinto Groundwater Management Area range from 47,000 acre-ft/yr in 1995 (58 percent of total demand), to 112,000 acre-ft/yr in 2010.

Agricultural demands are based on land use and are projected to decline from about 33,200 acre-ft/yr in 1995, to 31,000 acre-ft/yr in 2010. In 1990, about eight percent of the imported water served by EMWD was delivered to agricultural users. Throughout the planning period we assumed that agricultural demands would be satisfied with groundwater and reclaimed water.

Sources of Supply

The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

Imported Water from Metropolitan. The quality of treated imported water is generally excellent and meets all drinking water regulations. TDS in Colorado River water and, occasionally, SWP water, causes TDS concentration in wastewater to exceed the TDS limit specified for wastewater plants. The TDS concentrations in water will increase from 200 to 300

TABLE 5-1
PROJECTIONS OF MUNICIPAL AND AGRICULTURAL DEMANDS
WEST SAN JACINTO GROUNDWATER BASIN

Year	Municipal Demands(1) (acre-ft/yr)	Agricultural Demands (acre-ft/yr)
1995	47,000	33,000
2000	63,000	32,000
2005	84,000	31,000
2010	112,000	31,000

Sources: (1) EMWD Projections 8/94

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Water Resources Engineer

FIGURE 5-1 WATER DEMAND PROJECTIONS FOR THE WEST SAN JACINTO GROUNDWATER MANAGEMENT AREA

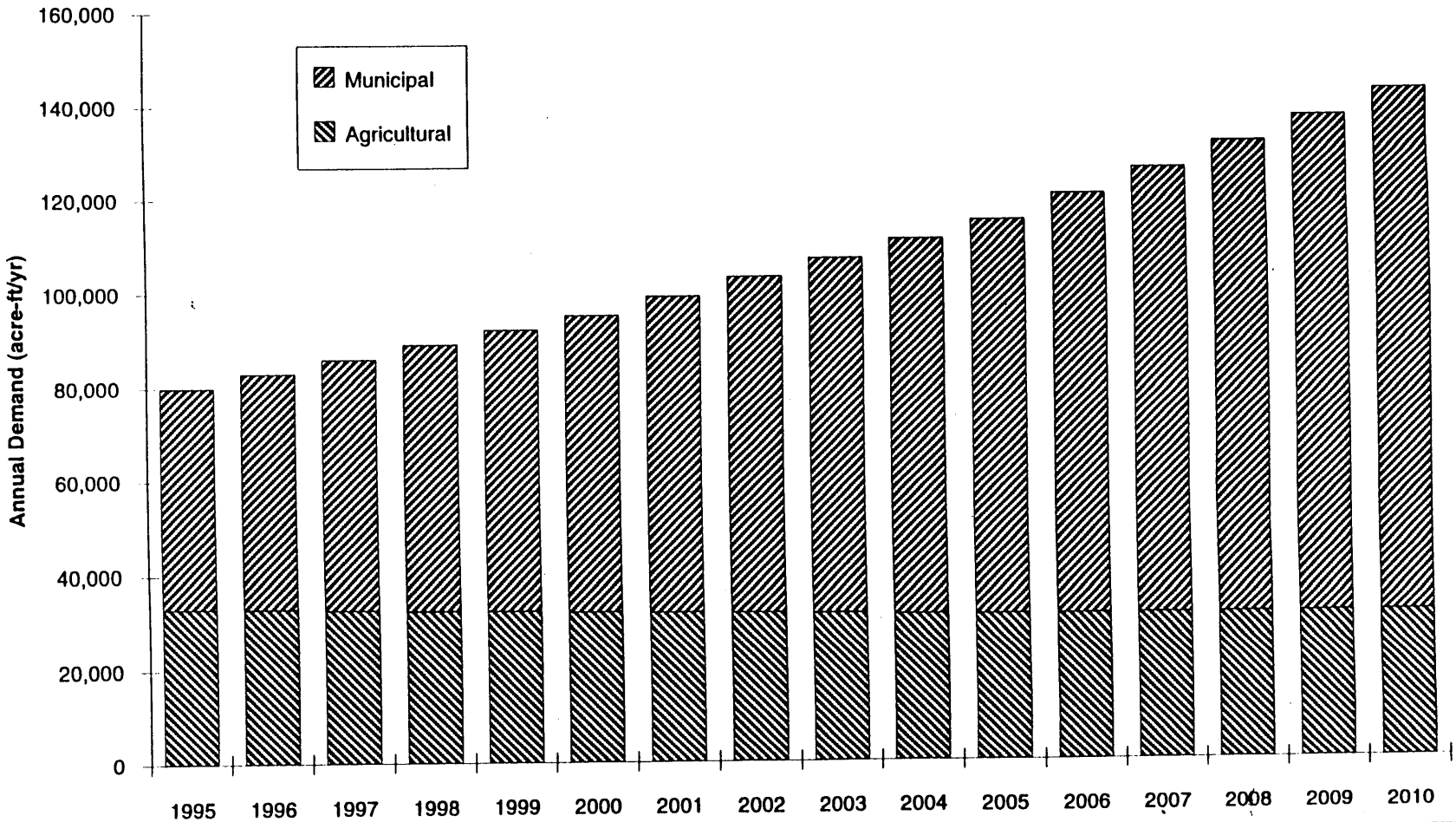

fig 5-1 Water Demands
9/2/94

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mg/L through typical municipal use. Thus, if the average TDS concentration in a water supply is 400 mg/L, the TDS concentration in the resulting wastewater will be about 600 to 700 mg/L. The TDS limits for EMWD's reclamation plants and the TDS required in the water supply to meet the TDS limits are listed below.

Reclamation Plant	TDS Limit (mg/L)	Water Supply TDS in the Tributary Area (mg/L)
Hemet-San Jacinto	575	325
Moreno Valley	550	300
Perris Valley	825	575
Sun City	950	700
Temescal	700	450

Figure 5-2 shows the TDS concentration of SWP water and Colorado River water available from Metropolitan in the management area. The average TDS concentration for SWP water is about 250 mg/L for the period shown in Figure 5-2. The comparable average for Colorado River water is about 660 mg/L. SWP water can be used in the areas tributary to all five reclamation plants listed above without causing violations, with the exception of the Moreno Valley plant that would have TDS concentrations in excess of the TDS limitations about 29 percent of the time. The use of Colorado River water or other sources with high TDS could cause TDS violations to occur at all five plants.

Metropolitan adopted a schedule of projected water rate increases in 1991. The water rates established included:

- a base rate;
- a treatment surcharge, to be added to the base rate for purchases of treated water; and
- a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

The goals of the seasonal discount are: to achieve greater conjunctive use of imported supplies and local supplies; encourage the construction of additional local production facilities; and reduce member agencies' dependence on Metropolitan deliveries during the summer months. Recently, Metropolitan announced water prices for 1993 and forecasted rates for the following ten years. The projected cost of imported water purchased from Metropolitan is listed in Table 5-2 and is shown graphically in Figure 5-3. Imported water costs after 2002 are assumed to increase 6 percent per year.

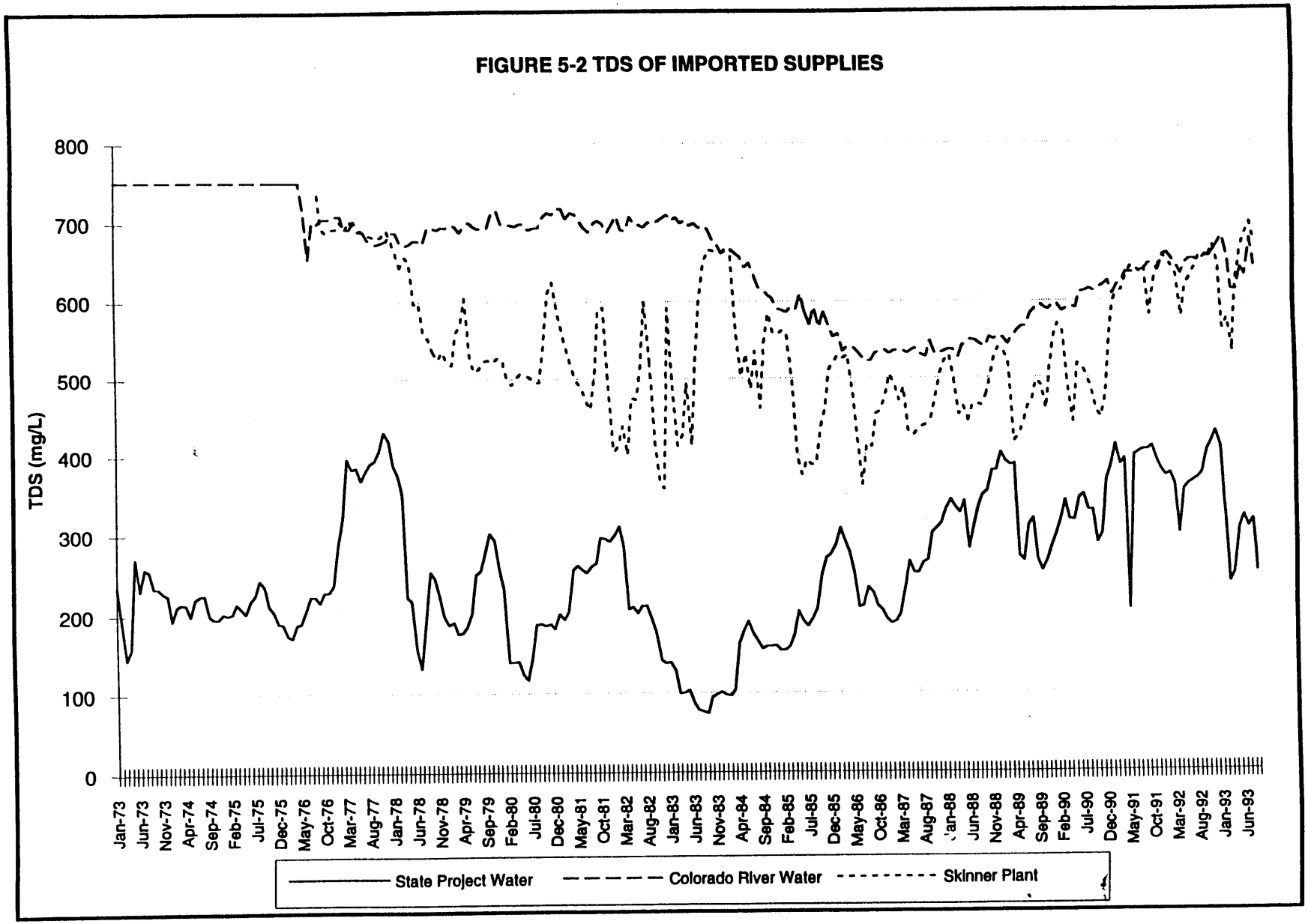

Figure 5-2 MWD
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TABLE 5-2
METROPOLITAN WATER RATE PROJECTIONS

4/2/94

Year	Treatment Surcharge	Base Rate	Base Treated	Seasonal Storage (1) Untreated	Seasonal Storage (1) Treated
1994	$77	$335	$412	$222	$275
1995	$77	$377	$454	$256	$256
1996	$78	$405	$483	$278	$279
1997	$78	$437	$515	$304	$304
1998	$89	$456	$545	$319	$328
1999	$98	$480	$578	$338	$345
2000	$104	$509	$613	$361	$366
2001	$105	$544	$649	$389	$390
2002	$109	$579	$688	$417	$420
2003	$114	$616	$730	$447	$451
2004	$119	$654	$773	$477	$481
2005	$124	$696	$820	$511	$515
2006	$130	$739	$869	$545	$550
2007	$136	$785	$921	$582	$587
2008	$142	$834	$976	$621	$626
2009	$148	$887	$1,035	$664	$669
2010	$154	$943	$1,097	$708	$713

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Water Resources Engineer

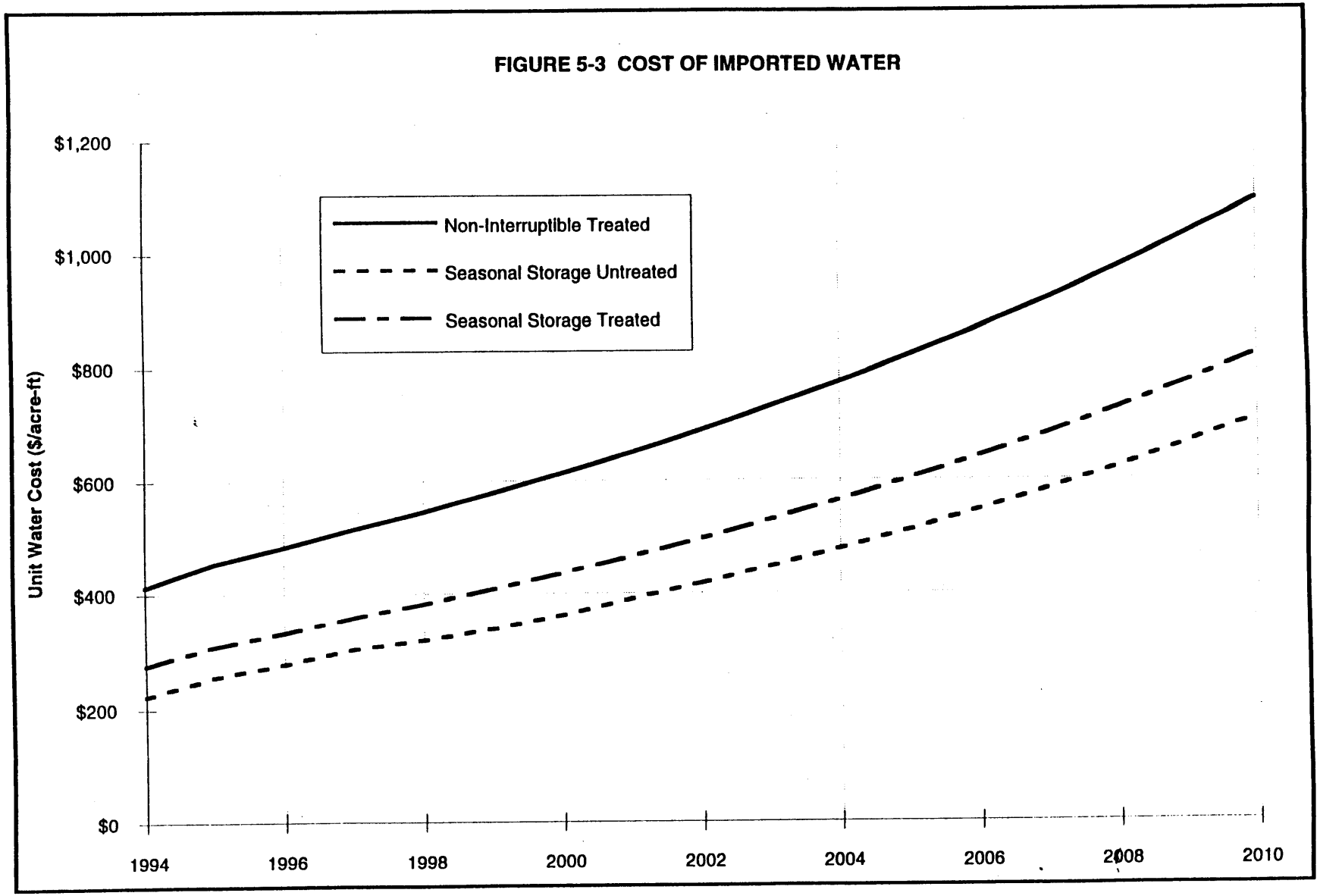

Figure 5-3
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Metropolitan is currently evaluating supply reliability for its service area (Metropolitan Water District of Southern California, 1994). Metropolitan is projecting that with year 2000 demands, shortages in retail supplies will occur at least four out of five years, with shortages up to 30 percent. By the year 2020, shortages will occur on average once in five years, with shortages up to 20 percent. The frequency and magnitude of retail shortages will be comparable for areas that depend heavily on Metropolitan.

Groundwater. Groundwater is available throughout the management area in that most of the management area overlies the West San Jacinto Basin. However, the quality of groundwater precludes the use of some of the management area groundwater for municipal supply. TDS and nitrate are the water quality constituents that limit the use of groundwater. TDS is regulated as a secondary standard. Secondary standards are for those substances that are not hazardous to health, but may cause taste, order, color, staining or other conditions that adversely affect the aesthetics of drinking water. The maximum contaminant level (MCL) for TDS is expressed as follows:

> *Recommended MCL* - 500 mg/L. TDS concentrations less than or equal to the *Recommended MCL* are desirable for a higher level of consumer acceptance.
>
> *Upper MCL* - 1,000 mg/L. TDS concentrations ranging up to the *Upper MCL* are acceptable if it is neither reasonable nor feasible to provide more suitable waters.
>
> *Short Term MCL* - 1,500 mg/L. TDS concentrations ranging up to the *Short Term MCL* are acceptable only for existing systems on a temporary basis, pending the construction of treatment facilities or the development of acceptable new water sources.

Nitrate is regulated under primary standards. The MCL for nitrate is 10 mg/L (as nitrogen). Table 5-3 lists the groundwater in storage, storage capacity, safe yield, and average TDS and nitrate concentrations for each groundwater subbasin in the management area. The subbasins are ranked in Table 5-3 from lowest to highest in TDS. From a drinking water perspective, approximately 36 percent of the yield of the West San Jacinto Basin could be developed from the Lakeview and Perris North subbasins for direct use, without additional treatment for TDS and nitrate. Some groundwater in the Perris South-I subbasin could also be used without treatment and San Jacinto Lower Pressure, Perris South-II and Perris South-III groundwater could be used

TABLE 5-3
AVAILABILITY OF GROUNDWATER IN THE WEST SAN JACINTO BASIN
YEAR 2000 CONDITIONS

Subbasin	Volume in Storage (acre-ft)	Storage Capacity (acre-ft)	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield (acre-ft/yr)	Safe Yield with Wastewater Recharge (acre-ft/yr)	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration (mg/L)	Average Nitrate Concentration (as Nitrogen) (mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	450	7
Lakeview	283,000	515,000	25%	6,800	6,800	14%	500	3
Perris South	248,000	402,000	22%	8,300	12,800	27%	920	5
San Jacinto Lower Pressure	382,000	391,000	34%	2,500	2,500	5%	1,000	4
Winchester	36,000	41,000	3%	1,600	1,800	4%	2,000	8
Menifee	56,000	101,000	5%	3,300	4,700	10%	2,250	6
Totals	1,128,000	1,797,000	100%	36,200	48,100	100%		
Average							891	5

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if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a water supply source are blending with low TDS supplies such as SWP water, and demineralization. From a wastewater perspective, most of the groundwater in the West San Jacinto Basin would have to be treated prior to use as a municipal supply.

EMWD is currently designing a groundwater demineralization facility in the Menifee area. This facility will produce about 3 mgd (3,360 acre-ft/yr) of potable water for municipal use. The source water to the desalter will have a TDS of about 2,400 mg/L. The product water will have a TDS concentration of about 400 mg/L. This project will develop the full yield of the Menifee-I and Menifee-II subbasins for municipal use.

The cost to use groundwater, exclusive of treatment, includes capital cost and operations and maintenance costs. The capital cost for new municipal wells ranges from about $400,000 to $500,000. This is equivalent to about $32 per acre-ft, assuming a 1,500 gpm well (2,420 acre-ft/yr), six percent amortization rate, 20-year amortization period and 50% usage. Fixed operating and maintenance costs are about $6 per acre-ft. Power costs vary according to lift and pumping plant efficiency. The cost for a pumping lift of 200 feet and overall plant efficiency of 60 percent is about $30 per acre-ft. Thus, the total cost to produce groundwater for a 1,500-gpm well, operating year round with a total lift of 200 feet would be about $68 per acre-ft.

Reclaimed Water. Currently, EMWD is in a phased process of implementing a reclaimed water distribution plan that will make reclaimed water available throughout the management area. The reclaimed water system consists of five reclamation plants and about 79 miles of backbone distribution pipelines. Figure 5-4 shows the layout of the pipelines and the location of reclamation plants. Table 5-4 shows the projections of the availability of reclaimed water during the planning period. Reclaimed water sources include the discharge of up to 30 mgd or 33,600 acre-ft/yr of reclaimed water from the city of San Bernardino. The TDS of reclaimed water from San Bernardino is projected to range between 480 mg/L to 500 mg/L, which is lower than any of the reclaimed water generated in EMWD. The use of reclaimed water replaces non-potable demand on groundwater and imported supplies.

For this study, we have assumed the cost of producing and distributing reclaimed water in the EMWD service area to be a sunk cost. EMWD must treat and dispose of reclaimed water. The

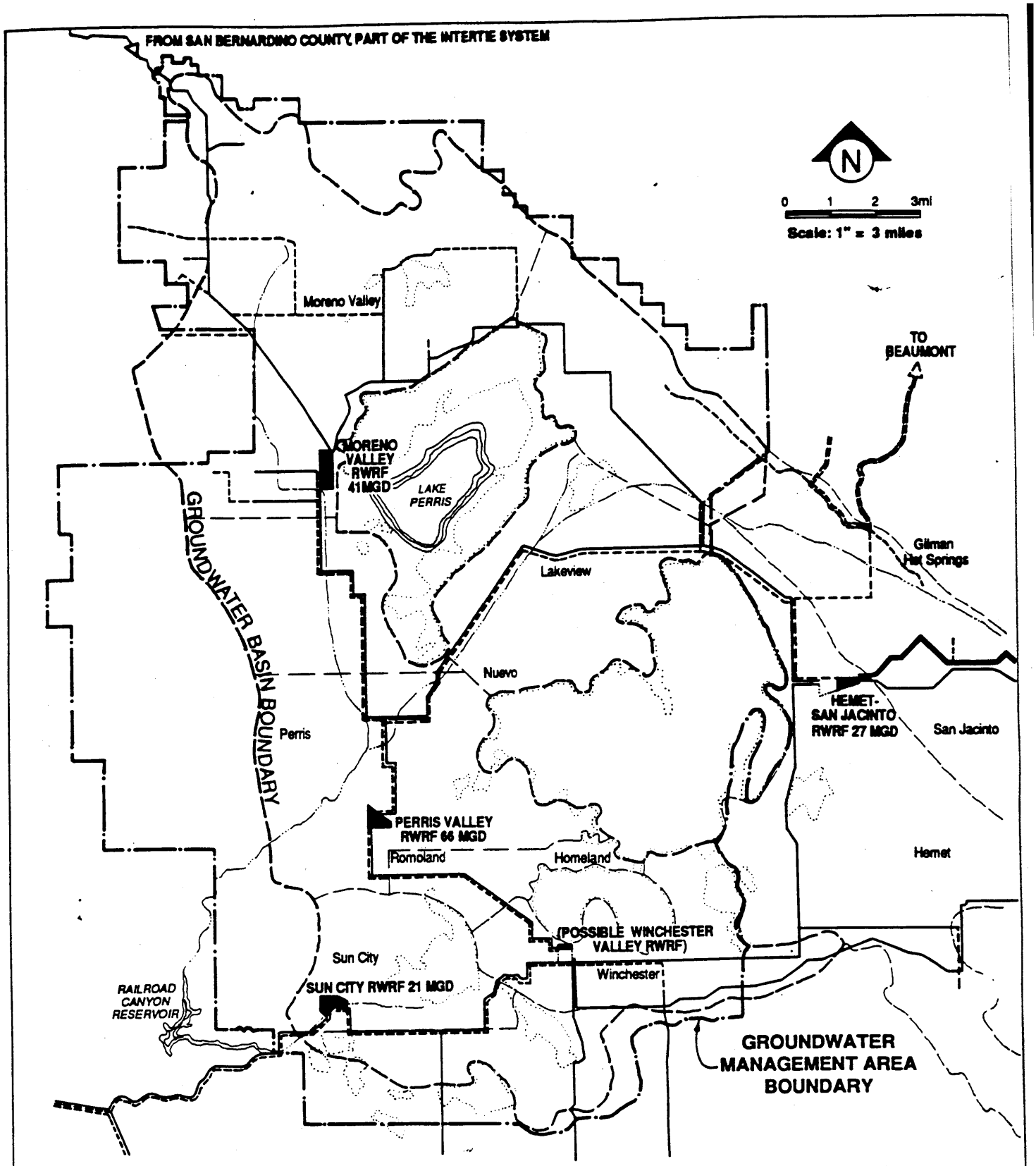

Figure 5-4

ULTIMATE RECLAIMED WATER SYSTEM

LEGEND:

——— EXISTING RECLAIMED WATER SYSTEM (CONSTRUCTED OR DESIGNED)

- - - - - ULTIMATE RECLAIMED WATER SYSTEM

■ RWRF LOCATION, WITH ULTIMATE CAPACITY

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REFERENCE: EMWD RECLAIMED WATER FACILITIES MASTER PLAN, 1993. (DOCUMENT FILE NAME: DFILEOIN.DGN, REV. 8/93)

TABLE 5-4
PROJECTED RECLAIMED WATER FLOWS
(acre-ft/yr)

Reclamation Plant	1995	2000	2005	2010
Moreno Valley	10,328	15,274	20,435	25,597
Perris Valley	8,110	11,994	16,041	20,089
Sun city	2,532	3,750	5,013	6,275
Temecula Valley (1)	5,332	7,897	10,558	13,219
Hemet-San Jacinto (1)	5,646	8,343	11,165	13,987
Subtotal	31,947	47,258	63,213	79,167
San Bernardino (2)	0	11,201	12,322	20,723
Totals	31,947	58,459	75,534	99,890

Sources: Wastewater Facilities Master Plan Black & Veatch and James M. Montgomery, 1990; Projected Water Demands and Planned Storage for the Years 1995 to 2005, Eastern Municipal Water District, 1993.

Note - (1) Reclaimed water from outside of West San Jacinto Groundwater Basin management area.
(2) Reclaimed water pumped to EMWD from city of San Bernardino.

Mark J. Wildermuth
Water Resources Engineer

cost of the reclaimed water distribution system is the cost of disposal. The value of the reclaimed water as a resource to non-potable water users is equal to their next least costly source of water. For a farmer, the value of the reclaimed water is approximately the same as the cost to produce groundwater. A typical 1,000 gpm agricultural well cost would be about $250,000. Assuming the well is operated half the year, the amortization cost is about $27 per acre-ft. Total operation and maintenance costs would be about $36 per acre-ft for a total lift of 200 feet. The total cost of operating a well for an agricultural supply is about $63 per acre-ft. These costs would be about the same for industrial and large urban landscape users. These costs vary with depth to groundwater and location in the study area.

WATER SUPPLY PLAN WITHOUT GROUNDWATER MANAGEMENT PLAN

The water supply plan for the management area, in the absence of a groundwater management plan, consists of the use of imported water for all municipal uses and a combination of groundwater and reclaimed water for agricultural uses. All agricultural demands would be satisfied with reclaimed water by the year 2010. The Menifee desalter would be operational in 1997, producing about 3,360 acre-ft/yr. The water supply plan for the management area is listed in Table 5-5. Groundwater usage in 1995 is estimated to range from 26,600 acre-ft/yr (33 percent of total supply) in 1995, to 28,000 acre-ft/yr by 2010 (19 percent of total supply). The Menifee desalter will require about 4,200 acre-ft/yr of groundwater to produce 3,360 acre-ft/yr of product water.

Imported water use in the management area is projected to range from about 44,500 acre-ft/yr (56 percent of total supply) in 1995, to 103,000 acre-ft/yr (72 percent of total supply) by the year 2010. Imported water is used for municipal purposes only. Reclaimed water use in the management area is projected to range from about 8,900 acre-ft/yr (11 percent of total supply) in 1995, to 11,900 acre-ft/yr (8 percent of total supply) by the year 2010. Reclaimed water would be used for agricultural and non-potable municipal purposes.

The cost of this water supply plan, exclusive of the distribution costs, is summarized in Table 5-6. Table 5-6 shows the annual demand, supplies by source and cost of each source in terms of annual cost, total annual cost and present value of all cost over the 1995 to 2010 planning period. The fractions of total supply and total supply cost by source are listed below.

TABLE 5-5
WATER SUPPLY PLAN IN THE ABSENCE OF
A GROUNDWATER MANAGEMENT PLAN
(acre-ft/yr)

Year	1995		2000		2005		2010	
	Volume	Fraction	Volume	Fraction	Volume	Fraction	Volume	Fraction
Municipal Demand	47,000	100%	63,000	100%	84,000	100%	112,000	100%
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Menifee Desalter	0	0%	3,360	5%	3,360	4%	3,360	3%
Reclaimed Water	0	0%	1,000	2%	2,000	2%	3,000	3%
Groundwater	2,500	5%	2,500	4%	2,500	3%	2,500	2%
Agricultural Demand	33,000	100%	32,000	100%	31,000	100%	31,000	100%
Reclaimed Water	8,900	27%	8,900	28%	8,900	29%	8,900	29%
Groundwater	24,100	73%	23,100	72%	22,100	71%	22,100	71%
Total Demand	80,000	100%	95,000	100%	115,000	100%	143,000	100%
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Menifee Desalter (1	0	0%	3,360	4%	3,360	3%	3,360	2%
Reclaimed Water	8,900	11%	9,900	10%	10,900	9%	11,900	8%
Groundwater (2)	26,600	33%	25,600	27%	24,600	21%	24,600	17%

note - (1) actual groundwater production for the Menifee desalter will be about 4,200 acre-ft/yr with 3,360 acre-ft/yr of potable water and 1,840 acre-ft/yr.

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TABLE 5-6
COST OF WATER SUPPLY FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA WITHOUT A GROUNDWATER MANAGMENT PLAN

Year	Demand	Imported Water			Reclaimed Water			Groundwater											Total Cost	Composite Unit Cost of Supply
								Menifee Desalter			Agricultural Use			Municipal Use			Total Cost of Groundwater Production			
	(acre-ft/yr)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	($)	($)	($/acre-ft)
1995	80,000	44,500	$454	$20,203,000	8,900	$63	$560,700	0	$501	$0	24,100	$63	$1,518,300	2,500	$68	$170,000	$1,688,300	$22,452,000	$281
1996	83,000	47,500	$483	$22,942,500	9,100	$66	$596,232	0	$516	$0	23,900	$66	$1,565,928	2,500	$71	$176,800	$1,742,728	$25,281,460	$305
1997	86,000	47,140	$515	$24,277,100	9,300	$68	$633,709	3,360	$532	$1,787,520	23,700	$68	$1,614,937	2,500	$74	$183,872	$3,586,329	$28,497,138	$331
1998	89,000	50,140	$545	$27,326,300	9,500	$71	$673,231	3,360	$549	$1,844,640	23,500	$71	$1,665,361	2,500	$76	$191,227	$3,701,228	$31,700,759	$356
1999	92,000	53,140	$578	$30,714,920	9,700	$74	$714,901	3,360	$578	$1,942,080	23,300	$74	$1,717,235	2,500	$80	$198,876	$3,858,191	$35,288,012	$384
2000	95,000	56,140	$613	$34,413,748	9,900	$77	$758,826	3,360	$613	$2,059,752	23,100	$77	$1,770,595	2,500	$83	$206,831	$4,037,178	$39,209,752	$413
2001	99,000	60,140	$649	$39,030,784	10,100	$80	$805,122	3,360	$649	$2,180,716	22,900	$80	$1,825,476	2,500	$86	$215,104	$4,221,296	$44,057,202	$445
2002	103,000	64,140	$688	$44,128,240	10,300	$83	$853,908	3,360	$688	$2,311,760	22,700	$83	$1,881,914	2,500	$89	$223,708	$4,417,383	$49,399,531	$480
2003	107,000	68,140	$730	$49,742,115	10,500	$86	$905,308	3,360	$730	$2,452,885	22,500	$86	$1,939,947	2,500	$93	$232,657	$4,625,489	$55,272,912	$517
2004	111,000	72,140	$773	$55,764,130	10,700	$90	$959,454	3,360	$773	$2,597,370	22,300	$90	$1,999,611	2,500	$97	$241,963	$4,838,944	$61,562,528	$555
2005	115,000	76,140	$820	$62,434,704	10,900	$93	$1,016,484	3,360	$820	$2,755,296	22,100	$93	$2,060,944	2,500	$101	$251,642	$5,067,882	$68,519,069	$596
2006	120,600	81,540	$869	$70,858,158	11,100	$97	$1,076,540	3,360	$869	$2,919,942	22,100	$97	$2,143,382	2,500	$105	$261,707	$5,325,031	$77,259,729	$641
2007	126,200	86,940	$921	$80,071,632	11,300	$101	$1,139,775	3,360	$921	$3,094,668	22,100	$101	$2,229,117	2,500	$109	$272,175	$5,595,960	$86,807,367	$688
2008	131,800	92,340	$976	$90,123,726	11,500	$105	$1,206,346	3,360	$976	$3,279,474	22,100	$105	$2,318,282	2,500	$113	$283,062	$5,880,819	$97,210,890	$738
2009	137,400	97,740	$1,035	$101,160,779	11,700	$109	$1,276,419	3,360	$1,017	$3,417,239	22,100	$109	$2,411,013	2,500	$118	$294,385	$6,122,637	$108,559,835	$790
2010	143,000	103,140	$1,097	$113,144,452	11,900	$113	$1,350,167	3,360	$1,041	$3,497,882	22,100	$113	$2,507,454	2,500	$122	$306,160	$6,311,496	$120,806,115	$845
Total Volume	1,719,000	1,100,959			166,400			47,041			364,600			40,000					
Fraction of Total	100%	64%			10%			3%			21%			2%					
Total Cost				$866,336,287			$14,527,124			$36,141,224			$31,169,495					$951,884,301	
Fraction of Total				91%			2%			4%			3%						
Present Value																		$556,663,649.25	

Table 5-6
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Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Menifee Desalter	3%	4%
Groundwater	23%	3%

The most expensive water in the supply plan is Menifee desalter water, ranging from $532 to $1,041 per acre-ft over the planning period. The second most expensive water in the supply plan is imported water, ranging from $454 to $1097 per acre-ft over the planning period. The cost of reclaimed water and groundwater are about one-tenth that of imported water, ranging from about $63 to $122 per acre-ft over the planning period. From a purely economic viewpoint, the cost of future supplies could be reduced if more groundwater and reclaimed water can be used for municipal supplies. The present value cost of future water supplies in the management area, exclusive of new pipelines, pump stations and reservoirs, is about $557,000,000 for the period of 1995 to 2010.

SECTION 6

SECTION 6
GROUNDWATER MANAGEMENT GOALS

The mission statement of EMWD is:

> ***The mission of the Eastern Municipal Water District is to deliver a dependable supply of safe, quality water and provide sewage collection services to its customers in an economical, efficient and publicly responsible manner.***

The water supply part of EMWD's mission statement is a goal shared by all purveyors of water in the West San Jacinto Groundwater Basin management area. Groundwater, as a potentially important part of the water supply in the management area, should be incorporated into the water supply plans of the management area. The safe yield of the West San Jacinto Basin is about 32,000 acre-ft/yr. Projections of groundwater usage in the management area range from about 30,000 acre-ft/yr in 1995, to 28,000 acre-ft/yr in 2010.

Agricultural groundwater use will decrease slightly in the future, from about 24,100 acre-ft/yr to 22,100 acre-ft/yr, as agricultural lands are converted to urban uses. Remaining agricultural water demand will be converted to reclaimed water. The need for potable water will increase dramatically in the future. Potable water demands in the management area will range from 69,600 acre-ft/yr in 1995, to 167,000 acre-ft/yr by 2010.

Most of the new potable demand will be met from treated imported water purchased from Metropolitan. Metropolitan's supplies are projected to increase in cost about 142 percent over the 1995 to 2010 planning period, from $454 per acre-ft in 1995, to $1097 per acre-ft in 2010. Metropolitan's supply is also not entirely reliable. For year 2000 demands, Metropolitan has projected shortages in four years out of five years, ranging from 10 to 30 percent.

There are many private groundwater producers in the management area that do not rely on EMWD for water supply. The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved or equitably replaced.

Based on the above comments, the goal of the groundwater management plan is to

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin Management area.***

There are several elements that could go into the management plan to achieve this goal. The next section describes these elements.

SECTION 7

SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

This section describes the features or elements that can be used to build a groundwater management plan that is consistent with the management plan goal described in Section 6 and A.B. 3030. These elements include: new management policies, yield enhancement programs, conjunctive use, and the exchange of agricultural and other non-potable water users from groundwater to reclaimed water. These elements are described below.

MANAGEMENT POLICY ELEMENTS

Management policy elements consist of developing and implementing policies, regulations and coordinated activities among the groundwater producers. Currently, there is no routine monitoring of groundwater production, groundwater level and groundwater quality in the management area. There are no programs or institutions that routinely collect and review these data. There are no management tools available to forecast the impact of existing and future groundwater management practices. Consequently, there is little information available to site new groundwater recharge and extraction facilities.

Currently, there is no coordination or oversight of well construction in the management area. There is no systematic plan to manage unused and obsolete wells. The management plan needs to include policies to manage well construction and to ensure their destruction when wells become obsolete.

Monitoring of Groundwater Production, Groundwater Levels and Groundwater Quality

Groundwater Production. There is very little reported groundwater production data in the management area. The reported groundwater production volumes for the period ranged from 6,000 to 13,000 acre-ft/yr during the five-year period of 1987 to 1991 (see table 4-3). The 1991

estimate of agricultural demand in the management area, based on land use, is about 33,200 acre-ft/yr, of which about 27,000 acre-ft is estimated to be satisfied with groundwater. Groundwater production needs to be limited to the long term safe-yield of the management area and, locally, to the safe yield of the individual subbasins in the management area. Temporary overdraft could be allowed and, occasionally, encouraged during periods of imported supply shortages, as long as there is a way to replenish the overdraft. Uncontrolled overdraft, similar to that which occurred prior to the mid 1970's, will cause groundwater levels to drop, some wells to dry up, increase the cost of producing groundwater and lead to groundwater quality degradation. Therefore, it is important to obtain accurate information on groundwater production volume and to make a determination of the hydrologic balance for each subbasin in the management area.

Groundwater Level and Quality Monitoring. The monitoring of groundwater level (or storage) data includes the routine collection and review of groundwater level data to determine the hydraulic and volumetric response of the groundwater basin to groundwater management activities and climate. The monitoring of groundwater quality includes the collection and review of groundwater quality data that can be used to assess current and future trends in groundwater quality, and to evaluate groundwater quality response to groundwater management activities and climate.

Administration and Monitoring of Well Construction

Monitoring of Well Construction. The monitoring of well construction and location is extremely important to the understanding of current groundwater conditions and for future groundwater development. Well construction information includes the size and design of the well, lithology and aquifer test data. These data are necessary for the interpretation of groundwater production, level and quality data; and the evaluation of the aquifer as a source of supply. For the management plan, all these data should be collected, digitized and placed into a data base for future use. EMWD is in the process of completion of this data base for most of the existing wells in the management area. These data would be made available to all groundwater producers so that the producers can more reliably construct and operate new wells. These data would be used in future groundwater studies.

Administration of Well Construction Policies. Poor well construction can lead to groundwater contamination and excessive drawdown. Contamination can occur from inadequate sanitary seals, location of wells in, or near, contaminated groundwater, and cross contamination.

Excessive drawdown could be caused by over-extraction, interference from other adjacent wells or poor aquifer properties. Policies need to be developed that:

- Specify criteria that will be used to locate wells. Well location criteria would be established to ensure that new wells do not contribute to groundwater quality degradation. The intent of this policy is to minimize the redirection and acceleration of known contaminated groundwater to areas of potable supply.

- Develop minimum well construction standards. Minimum well construction standards would be developed based on existing state and county standards and additional standards that will be unique to the management area.

- Review and approval of proposed new well locations and well designs. The intent of the policy is to protect groundwater quality consistents with well siting criteria and construction standards.

Administration of Well Abandonment and Destruction Program

There are many obsolete and unused wells in the management area that are potentially useful for future production and monitoring of groundwater levels and quality. Unused wells could also be a source of contamination. Illegal disposal of wastes sometimes occurs in unused wells. Cross contamination between aquifers can occur through wells when contaminated groundwater in one aquifer flows into a well, vertically, through the casing and out of the well into an uncontaminated aquifer. The management plan should contain policies and regulations that will locate all obsolete and unused wells, and make a determination as to the most beneficial fate of each such well. Obsolete and unused wells that do not present a water quality contamination threat and have a potential use should be preserved. Otherwise, these wells should be properly destroyed.

Groundwater Quality Protection

Groundwater quality protection will maintain existing yield and reduce the future cost of water treatment. There are two parallel tracks to follow:

- prevention of pollution

- control and mitigation of existing groundwater quality problems.

EMWD should develop an aggressive groundwater pollution prevention program that, at a minimum, embodies the Basin Plan. Groundwater quality should be constantly monitored to assess spatial and time trends in groundwater quality in the groundwater management area. At a minimum, these efforts should include the monitoring of water quality data from municipal and agricultural wells, landfills, chemical and industrial operations, underground storage tanks, areas undergoing groundwater remediation such as March Air Force Base, sludge disposal areas and reclaimed water recharge areas. EMWD should consider obtaining authority to act proactively to prevent pollution and to take immediate action on new pollution threats when they occur.

The control and mitigation of existing groundwater quality problems consists of the containment and, potentially, the remediation of existing water quality problems, such that adjacent high quality groundwater resources are not degraded. Three major areas of concern in the West San Jacinto Groundwater Management Plan area are high TDS groundwater in the Perris South II subbasin (Ski Land area), migration of high TDS groundwater from the Winchester subbasin into the Hemet subbasin, and the organics contamination at March Air Force Base. The groundwater management plan should contain elements that will ensure that these three problems are controlled and mitigated.

EMWD has initiated a pollution prevention program in the Menifee subbasin. This program will intercept and treat saline groundwater that would otherwise migrate to areas with high quality groundwater and cause the abandonment of wells. This program will lead to the eventual recovery of the entire Menifee subbasin.

YIELD ENHANCEMENT ELEMENTS

Artificial Recharge

Artificial recharge is the recharge of water from sources that are not normally tributary to groundwater. There are three sources of water for artificial recharge in the West San Jacinto Groundwater Basin management area: local runoff, imported water and reclaimed water.

Artificial recharge with local runoff. There are several ways local runoff can be captured and recharged. The most common approach is to divert storm flows into spreading basins where the captured water can percolate into the underlying groundwater basin. Spreading basins can have

multiple uses including flood peak attenuation, water treatment, recharge of imported water and reclaimed water, wildlife habitat enhancement and recreational use.

Several factors must be considered for the development of a spreading basin. They include:

- Water rights
- Availability of recharge water
- Surface flow and flood hazard impacts
- Percolation rates
- Subsurface permeability and the presence of barriers or aquitards that hinder percolation
- Depth to groundwater
- Underlying groundwater quality
- Recharge water quality
- Proximity to major areas of groundwater production
- Creation of undesirable conditions such as high groundwater levels or vector problems
- Economic feasibility

Runoff generated on individual lots can be retained and recharged on individual lots. This would require special grading and drainage specifications on individual lots and is only practical for new development. The same considerations for spreading basins apply to artificial recharge through local retention and recharge.

Most of the precipitation for frequently occurring precipitation events that falls on undeveloped land is lost to evapotranspiration. Groundwater recharge occurred only during periods of heavy rainfall prior to the development of the land. About 60 to 80 percent of the land becomes impervious as land is developed for urban uses. The remaining land is irrigated and has relatively high soil moisture. Consequently, precipitation that falls on developed land is either:

- converted to runoff; or
- recharges the groundwater basin through presaturated soils.

New runoff due to developed land can be collected and recharged, a process referred to as water harvesting. EMWD has conducted studies of water harvesting in the San Jacinto and Hemet subbasins, but has not yet conducted such studies in the West San Jacinto Groundwater Management Area. EMWD is currently evaluating these studies and proceeding to implement water harvesting in these subbasins. EMWD has stated a goal of reaching 10,000 acre-ft/yr of additional yield in its service area using water harvesting.

Artificial recharge of runoff can occur anywhere in the management area where suitable recharge facilities can be sited. The DWR published a draft report in 1975, *TIR 1335-11-A-3 Preliminary Evaluation of Potential Artificial Recharge sites and Sink Sites in the San Jacinto Study Area* (California Department of Water Resources, 1975) that concluded that conditions conducive to artificial recharge through spreading basins exist in the Lakeview, Perris North and Perris South subbasins. In the Lakeview subbasin, there is a one mile-wide band of tight surface sediments along the San Jacinto River. The rest of the subbasin appears to have good recharge characteristics. Water quality in this subbasin is generally good and the unused storage capacity is about 230,000 acre-ft (see Table 5-3). Recharge in the Perris North subbasin could occur along a small creek that drains the Pigeon Pass Valley, in spreading basins located at the base of the hills on the south side of the subbasin and near major drainage features such as the Perris Valley drain. There may be other areas suitable for spreading basins. Water quality in the Perris North subbasin is good. The unused storage capacity in the Perris North subbasin is about 220,000 acre-ft.

Groundwater quality in the Perris South subbasins ranges from acceptable to poor. The soils and geology appear to favor recharge in spreading basins. However, due to existing groundwater quality conditions, it may not be possible to recover additional potable groundwater without groundwater treatment. The unused storage capacity in the Perris South subbasins is about 120,000 acre-ft. The San Jacinto Lower Pressure, Menifee I, Menifee II and Winchester subbasins have soil and geologic conditions that appear non-suitable for surface spreading.

Imported Water. Recharge of imported water can occur through surface spreading, direct injection and by in-lieu recharge. Surface spreading is done by conveying imported water to spreading basins for percolation. Untreated water can be used for surface spreading. Untreated off-peak water can be purchased at substantially lower rates if spreading is done between October 1 to April 30.

Conventional injection of imported water is accomplished by conveying treated water to wells and injecting the water into the saturated part of the groundwater basin. Imported water is discharged into the well below the standing water level in the well. The pressure in the well forces the water into the aquifer. Water used for injection into the saturated zone must be treated to drinking water standards prior to injection. Treatment consists of filtration and disinfection and can be obtained by either purchasing treated water from Metropolitan or by purchasing untreated water from Metropolitan and using other treatment facilities. Treated off-peak water can be purchased at substantially lower rates if injection is done between October 1 to April 30.

In-lieu recharge occurs when imported water is used in lieu of groundwater, allowing groundwater to accumulate in the groundwater basin. The basic premise is that imported water would be used when there is an abundance of imported water, allowing groundwater to accumulate. Groundwater production in excess of the normal extraction rates could occur when imported water is scarce due to drought or shortages in the imported water system.

The areas that are suitable for artificial recharge of imported water in spreading basins are identical to the areas described in *artificial recharge of runoff* above. Artificial recharge of imported water by injection can occur almost anywhere in the management area where groundwater production is practical. Considerations in siting injection facilities include favorable hydrogeologic conditions, proximity to source water facilities, proximity of recovery wells, and unused groundwater storage capacity. Unlike spreading basins that create a veneer of imported water on top of ambient groundwater, injection wells create a zone of imported water around the injection well. The injected water within this zone drifts slowly away from the injection well with the regional groundwater flow. The water quality in wells that tap into the injected water zone will have a water quality that is similar to the imported water.

Reclaimed water. Recharge of reclaimed water can occur through surface spreading, direct injection and by over irrigation. Recharge by percolation and injection is subject to regulatory approval. The DHS proposed regulations for planned recharge projects that recharge reclaimed water were described in Section 3 and are contained in Appendix A.

Reclaimed water can be used to augment potable supplies through groundwater recharge. The volume of natural recharge is small in the West San Jacinto Groundwater Basin management area. The dilution of reclaimed water that can be obtained in the groundwater basin could be

small and insufficient to achieve the dilution requirements in the proposed guidelines. Therefore, reclaimed water may have to be blended with other non-reclaimed water prior to recharge. The most probable source of blending water will be imported water purchased from Metropolitan.

The groundwater basins can also be used for seasonal storage of reclaimed water. Reclaimed water can be stored in the groundwater basins during the winter when demand for reclaimed water is low and recovered in the spring, summer and fall when reclaimed water demands exceed supply.

The subbasins in the management area that are conducive to recharge of reclaimed water, either by spreading or injection, include the Perris North, Lakeview and Perris South subbasins. Reclaimed water can be recharged in the San Jacinto Lower Pressure, Menifee and Winchester subbasins by injection.

Increase in Yield. The increase in yield from artificial recharge is approximately equal to the long term average annual volume of artificial recharge. That is, if the annual volume of artificial recharge is 30,000 acre-ft, then the increase in groundwater yield would be about 30,000 acre-ft. The Lakeview, Perris North and Perris South subbasins are the most promising subbasins for artificial recharge that can increase potable supplies to the West San Jacinto Groundwater Basin management area. These basins have a combined unused storage capacity of about 600,000 acre-ft, good water quality and reasonably good aquifer properties. The natural replenishment in these subbasins is small, averaging about 29,000 acre-ft/yr (Table 4-1). Hydrogeologic conditions and economics control the size of artificial recharge projects in these subbasins. Based on current information, it seems reasonable to expect that the combined increase in groundwater yield from artificial recharge could range from 30,000 to 50,000 acre-ft/yr.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of potential artificial recharge projects. The types of new information and studies that are required include:

- geophysical studies to determine aquifer boundaries and geometry
- hydrogeologic studies to determine aquifer hydraulic properties
- geochemical studies to establish ambient groundwater quality, trends, and compatibility of ambient groundwater with recharge water

- facility studies to site and evaluate engineering and facility requirements
- economic studies
- environmental studies

Part of these investigations should include demonstration or pilot projects. Demonstration-level artificial recharge projects should be done to test the technical and institutional feasibility of artificial recharge. Demonstration projects should include the following:

- Surface spreading in The Perris North, Perris South and Lakeview subbasins. Small recharge basins, observation wells and pipelines would be constructed and operated to develop data and design criteria for full scale projects. The source water would be imported water from Metropolitan and reclaimed water from EMWD.
- Groundwater Injection in The Perris North, Perris South and Lakeview subbasins. Injection of imported water could be done in the winter time using EMWD's existing wells in these subbasins. Small observation wells may need to be constructed.
- Water Harvesting in the Lakeview subbasin. Storm water captured in EMWD's Mystic Lake project could be captured and conveyed to test recharge basins in the Lakeview subbasin.

Recovery of Contaminated Groundwater

Some of the groundwater in the West San Jacinto Groundwater Management area is contaminated and cannot be put to beneficial use without treatment. Currently, production of contaminated groundwater is avoided. Contaminated groundwater takes up storage in the aquifer and reduces the useful storage capacity in the groundwater basins. Contaminated groundwater can be put to beneficial use through treatment. The types of treatment that are appropriate depend on the nature of contamination and the intended water use. The types of treatment that appear appropriate in the West San Jacinto Management area are blending, demineralization and nitrate removal through ion exchange. Other treatment technologies may be required if water quality conditions change or new types of contamination are discovered.

Blending. Blending is a very simple form of treatment and consists of mixing a poor quality supply with a suitable amount of high quality water such that the blend is of adequate quality for its intended use. Table 7-1 lists the groundwater subbasins, the reclamation plants that receive water from these subbasins, reclamation plant TDS regulatory limitations, estimated average

TABLE 7-1
BLENDING WATER REQUIREMENTS TO MEET TITLE 22 DRINKING WATER REGULATIONS AND WASTE DISCHARGE REQUIREMENTS AT RECLAMATION PLANTS

Subbasin	Supply Tributary to EMWD Reclamation Plant (1)	Reclamation Plant TDS Objective (mg/L)	Estimated Average TDS in Subbasin (2) (mg/L)	Required Water Supply TDS (mg/L)	Blending Ratio of SWP Water to Groundwater for SWP Water TDS (in mg/L) of 250	300
Perris North	Moreno Valley	550	450	300	3.0	Infeasible
Lakeview	Perris Valley	825	500	575	No Blending Required	No Blending Required
Perris South-I	Perris Valley	825	700	575	0.4	0.5
Perris South-II	Perris Valley	825	1,100	575	1.6	1.9
Perris South-III	Sun City	950	1,100	700	0.9	1.0
Menifee-I	Sun City	950	3,000	700	5.1	5.8
Menifee-II	Sun City	950	2,200	700	3.3	3.8
Winchester	(3)	na	2,000	na	na	na
San Jacinto Lower Pressure	Perris Valley	825	1,000	575	1.3	1.5

note - (1) based on Figure 3-1 Existing Wastewater Service Areas, Wastewater Facilities Master Plan, (Black & Veatch, James M. Montgomery, 1990); revised by EMWD 1993.

(2) Subbasin averages based on available data, and in most cases, old data. Average for Perris South-II excludes Ski Land area.

(3) Winchester subbasin is currently unsewered. In the future, the Winchester subbasin area will either be sewered to a new reclamation plant in Winchester area or sewered to an existing reclamation plant.

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TDS concentration for each subbasin, the water supply TDS requirement and the blending ratios for SWP water to groundwater. Based on existing groundwater quality information, blending SWP water with groundwater from the San Jacinto Lower Pressure, Perris North, Perris South-I, parts of Perris South-II, and parts of Perris South-III, could provide potable water that is also within the waste discharge requirements of EMWD reclamation plants. Generally, blending ratios around one are considered economically feasible and blending ratios of two could be feasible. Lakeview groundwater will not need to be blended. Perris North groundwater will need three parts of SWP water if it is to be used in the area tributary to the Moreno Valley reclamation plant. Groundwater from Perris South-I, Perris South-II, Perris South-III, and the San Jacinto Lower Pressure subbasins can easily be blended with SWP water. Menifee-I, Menifee-II and Winchester cannot be economically blended.

Demineralization. Demineralization is a treatment process that reduces the mineral content of groundwater to a specified level that is established for the use of the product water. Demineralization facilities, often called desalters, have been constructed in the Arlington subbasin, near Riverside, and are in design for the Chino Basin and the Menifee area.

The proposed Menifee desalter will convert 4,200 acre-ft/yr of groundwater pumped from the Menifee I and II subbasins with a TDS concentration of 2,400 mg/L to 3,360 acre-ft of potable water, with a TDS concentration of 400 mg/L (Black & Veatch, 1993). Product water from the Menifee desalter will be served in EMWD service area.

Demineralization could be used to recover the yield of the San Jacinto Lower Pressure, Perris South-I, Perris South-II, Perris South-III, and Winchester subbasins. These basins are excessively mineralized, partly from irrigated agriculture and partly from natural sources. The proposed Menifee desalter will recover the yield of the Menifee-I and Menifee-II subbasins. EMWD is considering treating groundwater from the Perris South II, Perris South III and Winchester subbasins at the Menifee desalter site in a future expansion of that facility.

Other Treatment Technologies. Other treatment technologies can be used to recover groundwater when other contaminants render groundwater unusable. Selective ion exchange can be used to remove specific ions such as nitrate or uranium. Granulated activated carbon (GAC), air stripping and advanced oxidation can be used individually, or in combination, to remove organic compounds. The need for these treatment technologies is unknown at this time due to the lack of water quality data.

Increase In Supply. Currently, contaminated groundwater is either avoided, or is used for non-potable demands such as agricultural or landscape irrigation. These non potable demands, whenever possible, could be supplied with reclaimed water, allowing the contaminated groundwater to be treated and supplied for municipal use. The volume of contaminated groundwater that can be recovered and used through blending will cause an equal reduction in the demand for imported water. The volume of contaminated groundwater that can be recovered through demineralization varies between 70 and 85 percent of the water produced for demineralization; the remaining water is a brine which must be exported. The volume of potable water produced by the demineralization will cause an equal reduction in the demand for imported water. The increase in supply from the recovery of contaminated groundwater is equal to the safe yield of the subbasins where the recovery projects will occur, minus the existing level of groundwater pumping in those subbasins. Table 7-2 summarizes considerations for blending and demineralization of elements and presents an estimate of the groundwater production that could be used for blending or demineralization. The volume of groundwater available for blending or demineralization is estimated as the safe yield of the subbasin, minus reported groundwater production. The safe yield used in this estimate includes the recharge of EMWD reclaimed water. The estimates of groundwater available for blending and demineralization shown in Table 7-2 are slightly higher than would be implemented because actual groundwater production by local producers is higher than reported production. Estimates of actual groundwater production will need to be developed prior to implementing blending or demineralization elements.

Cost. The cost of blending consists of the capital and operations and maintenance costs associated with wells, pipelines and reservoirs required to implement blending. The costs of these types of facilities are highly sensitive to location of wells, blending water sources and the design flow rates (e.g., base load or peaking). The development of these costs is beyond the scope of this investigation. Most of the facilities that will be required for blending will be required even if blending were not used. Thus, the incremental cost associated with blending facilities will be small, relative to the cost of future water distribution facilities. The volume of groundwater used with blending would offset the need for an equal amount of imported water. The SWP water used for blending is not a new imported water demand. The blending water would come from SWP water that would have been used if there were no blending with groundwater. Therefore, blending will cause a net decrease in imported water demands.

The cost of demineralization varies depending on source water quality, product water quality, well field(s), distribution system and the treatment technology. The Menifee desalter is a three

TABLE 7-2
CONSIDERATIONS FOR BLENDING AND DEMINERALIZATION ELEMENTS

Conjunctive Use Characteristics	Lakeview	Subbasin: Menifee	Perris North	Perris South (1)	San Jacinto Lower Pressure	Winchester
Groundwater Quality (2)	Good	Poor	Good	Poor	Poor	Poor
Range in Capacity of Producing Wells (gpm)	100-2,000	10-1,000	90-1,000	90-1,000	Unknown	100-850
Safe Yield						
Natural Safe Yield	6,800	3,300	13,700	8,300	2,500	1,600
Natural Safe Yield plus Reclaimed Water Recharge (acre-ft/yr)	6,800	4,700	19,500	12,800	2,500	1,800
Average Reported Groundwater Production 1987 to 1991 (2) (acre-ft/yr)	4,000	0	2,300	1,400	500	0
Potential Groundwater Production That could Be Used for Blending and Demineralization (acre-ft/yr)	Not Applicable	4,700	Not Applicable	12,100	700	1,800

note - (1) part of Perris South-I and -II have good quality water
(2) Production values shown in Table 4-3 and excludes small producers (<25 acre-ft/yr).

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mgd treatment plant with a capital cost estimated to range from $14,000,000 to $17,000,000. Table 7-3 lists the capital and operations and maintenance cost opinions for the Menifee desalter (Black & Veatch, 1993). The 1995 cost to produce water from the Menifee desalter is about $501 per acre-ft, which is slightly higher than comparable water imported from Metropolitan. By 2001, the unit cost of water from the Menifee desalter will be equal to water from Metropolitan.

Metropolitan has instituted a Groundwater Recovery (GWR) program that will subsidize the cost of these desalters up to $250 per acre-ft. In the GWR program, Metropolitan will purchase the product water from the desalter for up to $250 over Metropolitan's base treated rate and sell the water back to EMWD at the base treated rate. Metropolitan instituted this program to encourage the recovery of contaminated groundwater. Table 7-3 shows how the GWR program will work for the Menifee desalter.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of projects to recover contaminated groundwater. The types of new information and studies that are required include:

- geophysical studies to determine aquifer boundaries and geometry
- hydrogeologic studies to determine aquifer hydraulic properties
- geochemical studies to establish ambient groundwater quality, and trends
- facility studies to site and evaluate engineering and facility requirements
- economic studies
- environmental studies

Part of these investigations should include demonstration or pilot projects. Demonstration-level projects for the recovery of contaminated water should be done to test the technical and institutional feasibility of full scale projects. Demonstration projects should include the following:

- Pilot scale demineralization projects in Winchester, Perris South and San Jacinto Lower Pressure subbasins. These tests would provide design data for large scale projects.

- Well scale blending projects. Poor quality groundwater from out-of-service EMWD wells could be injected into EMWD's distribution system. This could be done with EMWD's Falico well in the Perris South subbasin

TABLE 7-3
MENIFEE DESALTER COSTS AND METROPOLITAN'S GROUNDWATER RECOVER PROGRAM

Year	Menifee Desalter Cost				Metropolitan Treated Base Rate	Metropolitan GWR Subsidy	Purchase Price to Metropolitan	Remaining Unsubsidized Cost	Unit Cost to EMWD
	Amortized Capital cost ($)	Annual O & M Cost ($)	Total Annual Cost (1) ($)	Unit Cost (2) ($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)
1995	$919,652	$1,748,734	$2,668,386	$794	$454	$250	$704	$90	$544
1996	$919,652	$1,801,196	$2,720,848	$810	$483	$250	$733	$77	$560
1997	$919,652	$1,855,232	$2,774,884	$826	$515	$250	$765	$61	$576
1998	$919,652	$1,910,889	$2,830,541	$842	$545	$250	$795	$47	$592
1999	$919,652	$1,968,216	$2,887,868	$859	$578	$250	$828	$31	$609
2000	$919,652	$2,027,262	$2,946,914	$877	$613	$250	$863	$14	$627
2001	$919,652	$2,088,080	$3,007,732	$895	$649	$246	$895	$0	$649
2002	$919,652	$2,150,722	$3,070,374	$914	$688	$226	$914	$0	$688
2003	$919,652	$2,215,244	$3,134,896	$933	$730	$203	$933	$0	$730
2004	$919,652	$2,281,701	$3,201,353	$953	$773	$180	$953	$0	$773
2005	$919,652	$2,350,152	$3,269,804	$973	$820	$153	$973	$0	$820
2006	$919,652	$2,420,657	$3,340,309	$994	$869	$125	$994	$0	$869
2007	$919,652	$2,493,277	$3,412,929	$1,016	$921	$95	$1,016	$0	$921
2008	$919,652	$2,568,075	$3,487,727	$1,038	$976	$62	$1,038	$0	$976
2009	$919,652	$2,645,117	$3,564,769	$1,061	$1,035	$26	$1,061	$0	$1,035
2010	$919,652	$2,724,471	$3,644,123	$1,085	$1,097	$0	$1,085	$0	$1,097

note (1) annual O & M cost escalate at three percent per year
(2) desalter produces 3,360 acre-ft/yr

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and other wells in Winchester and the Lower San Jacinto subbasins, as appropriate.

CONJUNCTIVE USE

Conjunctive use is an operational strategy that combines the operations of multiple sources of water and storage resources in such a way that the combined yield is greater than the yield that would occur from the sum of independent, uncoordinated operations of the sources. The same definition would apply if other goals could be achieved by coordinated operation and the yield remained at an acceptable level. Other goals might include reduced cost, more reliable supply, and the attainment of environmental objectives. In most cases, conjunctive use results in increased yield and lower cost. Conjunctive use is commonly associated with storing of imported water in groundwater basins for use during periods of shortage. The more general definition could involve EMWD reclamation and municipal distribution facilities, Metropolitan facilities and resources, state project facilities and resources, groundwater basins within EMWD, and, potentially, groundwater basins outside of EMWD. Conjunctive use can operate seasonally, over-year or both. Seasonal conjunctive use would bank water during seasonal period(s) of over-supply or abundance for use during dry times of the year. Over-year conjunctive use would bank water during years of over-supply or abundance for use during drought periods and imported water shortages.

Table 7-4 summarizes the considerations for conjunctive use projects by subbasin. Based on current knowledge of groundwater conditions, EMWD could bank local runoff, imported water purchased from Metropolitan and reclaimed water in the Lakeview, Perris North and Perris South subbasins during the period of October 1 through April 30, for use either during the summer, during periods of imported water shortages, or both. The unused storage capacity of the Lakeview, Perris North and Perris South subbasins is about 600,000 acre-ft. EMWD could use up to half (and possibly more) of this unused storage capacity for seasonal and over-year storage, thereby reducing the cost of imported water purchases and providing an additional source of water during periods of imported supply shortage.

Recharge would be accomplished with a combination of new spreading basins and injection wells. Recovery of recharge will be through existing and new production wells. Where practical, injection and production will occur at the same well. That is, injection will take place

TABLE 7-4
CONSIDERATIONS FOR CONJUNCTIVE USE PROJECTS

Conjunctive Use Characteristics	Subbasin					
	Lakeview	Menifee	Perris North	Perris South(1)	San Jacinto Lower Pressure	Winchester
Unused Groundwater Storage Capacity (acre-ft)	230,000	40,000	220,000	150,000	9,000	5,000
Groundwater Quality (2)	Good	Poor	Good	Poor	Poor	Poor
Range in Capacity of Producing Wells (gpm)	100-2,000	10-1,000	90-1,000	90-1,000	Unknown	100-850
Recharge Methods	Spreading Basins In-Lieu Injection	Injection In-Lieu	Spreading Basins In-Lieu Injection	Spreading Basins In-Lieu Injection	Injection In-Lieu	Injection In-Lieu
Spreading Basin Potential	Yes	No	Yes	Yes	No	No
Proximity to Imported Water Facilities	State Project Water Colorado River Water		State Project Water	State Project Water Colorado River Water		State Project Water Colorado River Water
Proximity to Reclaimed Water Facilities	Yes	Yes	Yes	Yes	Yes	Yes
Proximity to Major Drainage Facilities	San Jacinto River	Salt Creek	Perris Valley Drain	San Jacinto River Salt Creek	San Jacinto River	Salt Creek

note - (1) part of Perris South-I and -II have good quality water
(2) good quality water has a TDS less than 500 mg/L; poor quality water has TDS greater than 500 mg/L and generally greater than 1,000 mg/L

Mark J. Wildermuth
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during the recharge period of October 1 through April 30, followed by groundwater production at the same well during the period of May 1 to September 30. This type of aquifer storage and recovery scheme is ideal for areas where spreading is infeasible due to land use, low recharge rates or groundwater quality limitations.

Reclaimed water could be a source of recharge in a conjunctive use program for augmentation of potable supplies. Parts of groundwater subbasins could be used for the seasonal storage of reclaimed water.

Based on current knowledge of groundwater conditions, conjunctive use with imported supplies and local runoff in the San Jacinto Lower Pressure, Menifee and Winchester subbasins appears to be more difficult to implement and of less benefit. Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.

Increase in Supply. The increase in supply from conjunctive use could not be determined at this level of study. Under a worst case scenario, conjunctive use would reduce shortages that EMWD customers would face during imported water shortages and would reduce the cost of imported water use through the purchase of off-peak supplies and use of reclaimed water for recharge. EMWD should be able to shift about 30,000 to 50,000 acre-ft year of base rate purchases to off-peak, with large conjunctive use projects in the Lakeview, Perris North and Perris South subbasins. The reduction in cost would be much more substantial if a blend of reclaimed water and imported water were recharged during the winter.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of potential artificial recharge projects. The types of new information and studies that are required include:

- geophysical studies to determine aquifer boundaries and geometry
- hydrogeologic studies to determine aquifer hydraulic properties
- geochemical studies to establish ambient groundwater quality, trends, and compatibility of ambient groundwater with imported water
- facility studies to site and evaluate engineering and facility requirements
- economic studies
- environmental studies

Demonstration projects should be developed to test injection of treated imported water in the Lakeview, Perris North and Perris South subbasins. These demonstration projects would test the feasibility of well injection for groundwater recharge and aquifer storage and recovery for conjunctive use. Demonstration level injection well tests should be done for blends of treated imported water and reclaimed water.

EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE WATER USERS FROM GROUNDWATER TO RECLAIMED WATER

The exchange of agricultural and other non-potable groundwater production to municipal uses can occur through:

- retirement of agricultural lands, that is, the conversion of agricultural lands to non-agricultural uses; and
- by substituting other supplies such as reclaimed water.

Agricultural demands are projected to range from 33,000 acre-ft/yr in 1995 to 31,000 acre-ft/yr in 2010. The average agricultural demand during this period is approximately equal to the total yield of the West San Jacinto Basin. The substitution of reclaimed water for agriculture groundwater production and other non-potable uses is a prerequisite to developing municipal supplies from the West San Jacinto Groundwater Basin. There are some agricultural demands that cannot be satisfied with reclaimed water, such as dairy cow washing and processing of produce for market.

Increase in Supply. The increase in municipal supply that will occur from the exchange of agricultural and other non-potable groundwater production to municipal production is approximately one acre-ft for each acre-ft of exchange. Agricultural groundwater production is projected to range from about 24,100 acre-ft/yr in 1995, to 22,100 acre-ft/yr in 2010. A reasonable goal would be to exchange between 10,000 to 20,000 acre-ft of agricultural and other non-potable groundwater production to municipal production.

Demonstration-level projects for the exchange of agricultural and other non-potable users from groundwater to reclaimed water should be done to test the technical and institutional feasibility of full scale projects. Long term use of reclaimed water for irrigation may impact the drainage characteristics of the soil. Demonstration projects should be done to investigate the impacts from irrigation with reclaimed water on soils and evaluate appropriate soil and irrigation management practices. EMWD is currently in the process of completing exchange agreements similar to that

described above with Moreno Valley Ranch Golf Course and University of California, Riverside, in the Perris North subbasin and Mr. John D. Mott in Lakeview Subbasin.

Cost. The cost associated with supplying reclaimed water to agricultural users is the capital, operations and maintenance cost associated with the conveyance of reclaimed water to the agricultural and other non-potable water users. This cost is a sunk cost as EMWD must treat and dispose of reclaimed water whether any water exchange occurs or doesn't occur. The water supply cost associated with the exchange of agricultural groundwater production to municipal production with the retirement of agricultural lands is assumed to be zero.

SECTION 8

SECTION 8
GROUNDWATER MANAGEMENT PLAN

CONTENTS OF THE MANAGEMENT PLAN

The management plan described herein is a program to achieve the management plan goals and includes conceptual descriptions of elements of the plan, and a description of the process to define and implement these elements consistent with the management plan goal. This plan, when adopted, will be the groundwater management program for the West San Jacinto Groundwater Basin management area. The groundwater management program will include: the development and implementation of policies, engineering investigations, facilities construction and operation, and other management activities. There are significant deficiencies in the knowledge of the groundwater resources of the West San Jacinto Groundwater Basin management area. These deficiencies preclude the definitive descriptions for some of the physical and institutional elements of the groundwater management plan. The groundwater management program includes studies to develop additional information that is necessary to develop all the institutional and physical elements described in the plan.

MANAGEMENT PLAN CRITERIA

The goal of the management plan stated in Section 6 is:

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin management area</u>***

This goal extends to all groundwater users. Groundwater users that are not dependent on EMWD should benefit from the groundwater management plan. Adverse impacts, if any, from the

groundwater plan will be minimized or mitigated. The rights of private groundwater producers will be protected. Groundwater producers who extract 10 acre-ft/yr or less shall be exempt from the operation and implementation of the groundwater management plan.

The implementation of this goal and its attendant constraints requires a set of criteria from which to test the various elements of the Management Plan. These criteria include:

- meet future water demands
- minimize dependence on imported water
- adequate (safe) water supply quality
- minimum cost
- ease of implementation

The groundwater management plan must be an integral part of satisfying the water demands in the West San Jacinto Groundwater Basin management area. Each element of the plan must, on its own, either add to the water supply or, by complementary action, cause the yield of another element to increase.

Minimizing the dependence on imported water is driven by the need for reliability and cost. The management area will, for the foreseeable future, be heavily dependent on imported water. Imported water is expensive and prone to shortage. Groundwater, properly managed, can be used to minimize peak seasonal demand on imported supplies and can provide carry-over storage for use when shortages occur in the imported supply.

The yield developed by the management program should, when delivered to water users, be of suitable quality. For municipal users this will be potable quality. For private groundwater producers, groundwater quality should be improved or the same as if the groundwater management plan did not exist.

The cost of municipal water supplies should be less with the management plan. The water supply cost for private water users should be less or unchanged. The yield of the management plan is part of the mix of water sources available in the management area. The groundwater management elements incorporated in the groundwater management plan will be such as to minimize the cost of the total water supply and will not be based on the individual element cost.

The groundwater management plan should be implementable. The benefits, cost and institutional complexity should be such that it will be feasible to implement the groundwater management plan.

ULTIMATE PLAN DESCRIPTION

The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints. The management plan includes implementation of new policies, institutional arrangements, and physical projects. EMWD will be the agency responsible for implementation of the groundwater management plan. Based on the information developed in this study and presented in the previous sections, the ultimate groundwater management plan should include the following elements.

Establishment of a Groundwater Basin Manager

EMWD will implement the groundwater management plan. EMWD Board of Directors will be the decision-making body responsible for directing the implementation of the groundwater management plan. EMWD staff will serve as the staff to assist the EMWD Board of Directors in implementing the plan.

Upon adoption of the groundwater management plan, EMWD Board of Directors will appoint an Advisory Committee. The Advisory Committee will be composed of seven members, with one member each from city of Moreno Valley, city of Perris, Nuevo Mutual Water Company, Edgemont Gardens Mutual Water Company, and EMWD; and two members representing agricultural producers. The Advisory Committee shall study, review and provide comments on all groundwater management plan activities directly to the EMWD Board of Directors.

EMWD staff will prepare an annual engineering report describing the operation of the management plan for review by the EMWD Board of Directors, Advisory Committee and groundwater producers. EMWD, in consultation with the Advisory Committee and participating groundwater producers, will develop a coordinated operating strategy on an annual basis, based on the management plan and the findings of the annual report.

Monitoring of Groundwater Production

EMWD, in cooperation with the Advisory Committee, will implement a groundwater production monitoring program. Detailed estimates of the safe yield will be developed in the first year of the groundwater production monitoring. Groundwater production estimates will be developed by EMWD based on totalizing meters, energy usage and land use. EMWD will produce a groundwater production report and estimates of overdraft (if any). These data will be included in the annual report provided to the Advisory Committee. The production monitoring program will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Groundwater Level and Quality

EMWD, in cooperation with the Advisory Committee, will implement a groundwater level and quality monitoring program. Groundwater level and quality data will be collected from well owners. EMWD will measure groundwater levels and quality from select private wells. Groundwater levels and quality data from agencies' wells will be provided to EMWD by the agencies. EMWD will compile these data and develop estimates of the groundwater in storage, change in storage, overdraft and groundwater quality conditions. These data will be included in the annual report provided to the management committee.

Development of Well Construction Policies

EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, will develop well construction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies will be updated continuously based on new regulatory requirements and data. These polices will not limit or suspend groundwater production by existing groundwater producers.

Development of a Well Abandonment and Destruction Program

EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, should develop well abandonment and destruction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies should be updated continuously based upon new regulatory requirements and data.

Monitoring of Well Construction, Abandonment and Destruction

EMWD has compiled and digitized most, if not all the well construction information that is available for existing wells. EMWD, in cooperation with other groundwater producers, will collect well construction data for new wells. EMWD will provide comments and suggestions to supplement design criteria that will be required by other agencies, including the Department of Health Services and the Riverside County Health Department. EMWD, through the monitoring of groundwater production, will determine wells that are inactive and make recommendations to well owners regarding the fate of these wells.

Groundwater Quality Protection

EMWD, in cooperation with the Advisory Committee and parties responsible for groundwater quality degradation, should develop cooperative plans to prevent further degradation of groundwater and to integrate the solution of existing water quality problems to maximize the beneficial use of groundwater. The known areas of concern are the high TDS groundwater in the Perris South II (Ski Land area) and Winchester subbasins, and the groundwater contamination associated with March Air Force Base. The existing efforts undertaken by EMWD to rehabilitate the Menifee subbasins (the Menifee desalter project) will be completed independent of the groundwater management plan. Additional degraded groundwater areas could be discovered through groundwater monitoring.

Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use

The intent of this element is to increase the groundwater yield available for municipal use by either retiring agricultural and non potable demands or by substituting reclaimed water for groundwater used for agricultural and other non-potable uses. It is the goal of this element to maximize the exchange of groundwater production from non-potable uses to municipal uses. Incentives should be developed to encourage the exchange of agricultural groundwater production to municipal use. From an agricultural perspective, the cost of using reclaimed water should be equal to, or less than, the cost of groundwater.

EMWD should consider providing reliable reclaimed water service to individual farms and other non-potable users by constructing pipelines from EMWD reclamation facilities to logical points

in the farm irrigation systems. The farmer would pay for the reclaimed water at a rate that would make the farmer indifferent to either groundwater or reclaimed water; or at a rate slightly less than his groundwater production cost. The rate should be based on the actual cost of groundwater production and the usefulness of the farmer's well to EMWD. The farmer would pay for reclaimed water based on the operation and maintenance cost of his well. The farmer would produce only enough groundwater for potable uses on the farm, and future potable demands, when the land is developed, would be served by EMWD.

If the agricultural well were suitable for municipal use, then the farmer's well and necessary easements could be purchased by EMWD. The purchase price would be reflected in the cost of reclaimed water. In this case, the farmer would pay for reclaimed water based on the operation and maintenance cost of his well, less the amortized purchase price of the farmer's well. In either case, the reclaimed water rate may have to be discounted slightly to cause the exchange to occur.

Use of reclaimed water on some soils may reduce the drainage rate of soil and lead to water logged and other undesirable soil conditions. Each site where reclaimed water could be applied in lieu of groundwater needs to be evaluated to ensure that the reclaimed water can safely be applied to the soil. This evaluation will be completed prior to formalizing agreements to exchange groundwater for reclaimed water.

Maximize Yield Augmentation with Local Resources - Local Runoff and Reclaimed Water

Yield augmentation through the recharge of runoff (water harvesting) and through the recharge of reclaimed water should be implemented where consistent with water quality objectives and other elements of the groundwater management plan. The Lakeview, Perris North and Perris South subbasins appear to be the most feasible areas for this element. The cost associated with the recharge of runoff and reclaimed water are the capital and operation costs for the facilities to capture and recharge runoff and reclaimed water.

The specifics of recharge and conveyance facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate yield augmentation alternatives.

Maximize Conjunctive Use

Conjunctive use should be implemented in the West San Jacinto Groundwater Basin management area. The unused storage capacity in the West San Jacinto Groundwater Basin management area is about 670,000 acre-ft, with about 600,000 acre-ft or 90 percent in the Lakeview, Perris North and Perris South subbasins. The yield from conjunctive use, exclusive of safe yield, could range from 30,000 to 50,000 acre-ft, or perhaps larger. Conjunctive use will improve overall water supply reliability, groundwater quality, and will lower water supply cost. These benefits will be realized by all groundwater users.

The specifics of recharge, extraction, conveyance and treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate conjunctive use alternatives.

Groundwater Treatment

Groundwater treatment in the form of blending and demineralization should be done in the West San Jacinto Groundwater Basin management area to recover contaminated groundwater for municipal use. The specifics of treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to evaluate groundwater treatment feasibility.

Groundwater Management Plan Alternatives

Four groundwater management alternatives were developed to evaluate the economic benefits to all water users in the groundwater management area. All four of these alternatives include the following management elements:

- Establishment of Groundwater Basin Manager
- Monitoring of Groundwater Production
- Monitoring of Groundwater Level and Quality
- Development of Well Construction Policies
- Development of a Well Abandonment and Destruction Program
- Monitoring of Well Construction, Abandonment and Destruction
- Groundwater Quality Protection

Alternative 1 - Agricultural Exchange and Blending. Alternative 1 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 17,500 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use.

Alternative 2 - Agricultural Exchange, Blending and Demineralization. Alternative 2 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 21,700 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use. Five thousand three hundred acre-ft/yr of highly mineralized groundwater from the Perris South and Winchester subbasins will be pumped and demineralized to produce about 4,200 acre-ft of drinking water.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use. Alternative 3 includes all the elements of Alternative 2, plus conjunctive use. Conjunctive use will be implemented in the Perris North, Perris South I, Perris South II and Lakeview subbasins. Recharge would occur in spreading basins. Source water is state project water and reclaimed water. Average annual increase in recharge and extraction from conjunctive use will be about 30,000 acre-ft/yr.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use.. Alternative 4 is identical to Alternative 3 except that the conjunctive use element has been expanded to 50,000 acre-ft/yr.

Economic Evaluation of the Groundwater Management Plan Alternatives

Tables 8-1 through 8-4 illustrate the economic benefits that water users in the West San Jacinto Groundwater Basin management area would realize if a groundwater management plan were implemented. Each table lists the projected total demand for water and shows how that demand would be satisfied with each groundwater management plan alternative. For economic

TABLE 8-1
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 1 - AGRICULTURAL EXCHANGE AND BLENDING

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Imported Water: Total: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization: Volume	Municipal Use of Groundwater: Demineralization: Rate	Municipal Use of Groundwater: Direct Municipal Use: Volume	Municipal Use of Groundwater: Direct Municipal Use: Rate	Municipal Use of Groundwater: Volume	Municipal Use of Groundwater: Blending Rate	Municipal Use of Groundwater: Cost	Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,203,000	8,900	$63	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,300	0	$483	47,300	$22,845,900	10,849	$66	10,849	$710,826	22,351	$66	$1,464,438	0	$0	2,500	$71	0	$71	$176,800	2,500	24,851	$25,197,964	$304
1997	86,000	46,740	0	$515	46,740	$24,071,100	12,798	$68	12,798	$872,066	20,602	$68	$1,403,837	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	26,462	$28,466,235	$331
1998	89,000	49,540	0	$545	49,540	$26,999,300	14,747	$71	14,747	$1,045,067	18,853	$71	$1,336,045	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	24,713	$31,560,759	$355
1999	92,000	33,604	5,500	$578	39,104	$22,602,112	16,696	$74	16,696	$1,230,513	17,104	$74	$1,260,583	3,360	$609	8,636	$80	7,100	$80	$3,298,045	19,096	36,200	$28,391,254	$309
2000	95,000	34,655	5,500	$613	40,155	$24,615,015	18,645	$77	18,645	$1,429,123	15,355	$77	$1,176,947	3,360	$627	10,385	$83	7,100	$83	$3,553,296	20,845	36,200	$30,774,381	$324
2001	99,000	36,706	5,500	$649	42,206	$27,391,694	20,594	$80	20,594	$1,641,653	13,606	$80	$1,084,604	3,360	$649	12,134	$86	7,100	$86	$3,835,566	22,594	36,200	$33,953,516	$343
2002	103,000	38,757	5,500	$688	44,257	$30,448,816	22,543	$83	22,543	$1,868,898	11,857	$83	$982,989	3,360	$688	13,883	$89	7,100	$89	$4,189,309	24,343	36,200	$37,490,013	$364
2003	107,000	40,808	5,500	$730	46,308	$33,804,840	24,492	$86	24,492	$2,111,697	10,108	$86	$871,510	3,360	$730	15,632	$93	7,100	$93	$4,568,301	26,092	36,200	$41,356,348	$387
2004	111,000	42,859	5,500	$773	48,359	$37,381,307	26,441	$90	26,441	$2,370,929	8,359	$90	$749,540	3,360	$773	17,381	$97	7,100	$97	$4,966,679	27,841	36,200	$45,468,654	$410
2005	115,000	44,910	5,500	$820	50,410	$41,336,200	28,390	$93	28,390	$2,647,521	6,610	$93	$616,418	3,360	$820	19,130	$101	7,100	$101	$5,395,423	29,590	36,200	$49,995,562	$435
2006	120,600	50,310	5,500	$869	55,810	$48,498,890	28,590	$97	28,590	$2,772,818	6,610	$97	$641,075	3,360	$869	19,130	$105	7,100	$105	$5,665,672	29,590	36,200	$57,578,455	$477
2007	126,200	55,710	5,500	$921	61,210	$56,374,410	28,790	$101	28,790	$2,903,904	6,610	$101	$666,718	3,360	$921	19,130	$109	7,100	$109	$5,950,225	29,590	36,200	$65,895,257	$522
2008	131,800	61,110	5,500	$976	66,610	$65,011,360	28,990	$105	28,990	$3,041,040	6,610	$105	$693,387	3,360	$976	19,130	$113	7,100	$113	$6,249,252	29,590	36,200	$74,995,039	$569
2009	137,400	66,510	5,500	$1,035	72,010	$74,530,350	29,190	$109	29,190	$3,184,501	6,610	$109	$721,122	3,360	$1,035	19,130	$118	7,100	$118	$6,566,287	29,590	36,200	$85,002,260	$619
2010	143,000	71,910	5,500	$1,097	77,410	$84,918,770	29,390	$113	29,390	$3,334,573	6,610	$113	$749,967	3,360	$1,085	19,130	$122	7,100	$122	$6,857,835	29,590	36,200	$95,861,145	$670
Total Volume	1,719,000	765,929	66,000		831,929		350,045				201,955			47,040		202,831		85,200			335,071	337,026		
Fraction of Total		45%	4%				20%				12%			3%		12%		5%						
Total Cost						$641,033,264				$31,725,830			$15,937,480							$65,742,269			$754,438,842	
Fraction of Total						85%				4%			2%							9%				
Present Value																							$449,025,139	

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TABLE 8-2
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 2 - AGRICULTURAL EXCHANGE, BLENDING AND DEMINERALIZATION

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization: Volume	Municipal Use of Groundwater: Demineralization: Rate	Municipal Use of Groundwater: Direct Municipal Use: Volume	Municipal Use of Groundwater: Direct Municipal Use: Rate	Municipal Use of Groundwater: Blending: Volume	Municipal Use of Groundwater: Blending: Rate	Municipal Use of Groundwater: Municipal Cost	Municipal Use of Groundwater: Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,203,000	8,900	$63	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,300	0	$483	47,300	$22,845,900	11,269	$66	11,269	$738,345	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,197,964	$304
1997	86,000	46,740	0	$515	46,740	$24,071,100	13,638	$68	13,638	$929,304	19,762	$68	$1,346,598	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,466,235	$331
1998	89,000	49,540	0	$545	49,540	$26,999,300	16,007	$71	16,007	$1,134,359	17,593	$71	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,560,759	$355
1999	92,000	31,924	5,500	$578	37,424	$21,631,072	18,376	$74	18,376	$1,354,331	15,424	$74	$1,136,766	7,540	$609	6,136	$80	7,100	$80	$3,644,789	20,776	36,200	$29,766,958	$324
2000	95,000	32,555	5,500	$613	38,055	$23,327,715	20,745	$77	20,745	$1,590,086	13,255	$77	$1,015,984	7,540	$627	8,305	$83	7,100	$83	$4,002,073	22,945	36,200	$31,935,858	$336
2001	99,000	34,186	5,500	$649	39,686	$25,756,214	23,114	$80	23,114	$1,842,535	11,086	$80	$883,722	7,540	$649	10,474	$86	7,100	$86	$4,405,557	25,114	36,200	$34,888,027	$352
2002	103,000	35,817	5,500	$688	41,317	$28,426,096	25,483	$83	25,483	$2,112,635	8,917	$83	$739,252	7,540	$688	12,643	$89	7,100	$89	$4,954,190	27,283	36,200	$38,232,173	$371
2003	107,000	37,448	5,500	$730	42,948	$31,352,040	27,852	$86	27,852	$2,401,395	6,748	$86	$581,812	7,540	$730	14,812	$93	7,100	$93	$5,543,390	29,452	36,200	$41,878,637	$391
2004	111,000	39,079	5,500	$773	44,579	$34,459,567	30,221	$90	30,221	$2,709,876	4,579	$90	$410,593	7,540	$773	16,981	$97	7,100	$97	$6,159,104	31,621	36,200	$45,739,140	$412
2005	115,000	40,710	5,500	$820	46,210	$37,892,200	32,590	$93	32,590	$3,039,193	2,410	$93	$224,745	7,540	$820	19,150	$101	7,100	$101	$6,825,036	33,790	36,200	$49,981,175	$435
2006	120,600	46,110	5,500	$869	51,610	$44,849,090	32,790	$97	32,790	$3,180,158	2,410	$97	$233,735	7,540	$869	19,150	$105	7,100	$105	$9,300,185	33,790	36,200	$57,563,169	$477
2007	126,200	51,510	5,500	$921	57,010	$52,506,210	32,990	$101	32,990	$3,327,537	2,410	$101	$243,085	7,540	$921	19,150	$109	7,100	$109	$9,802,183	33,790	36,200	$65,879,015	$522
2008	131,800	56,910	5,500	$976	62,410	$60,912,160	33,190	$105	33,190	$3,481,619	2,410	$105	$252,808	7,540	$976	19,150	$113	7,100	$113	$10,331,196	33,790	36,200	$74,977,783	$569
2009	137,400	62,310	5,500	$1,035	67,810	$70,183,350	33,390	$109	33,390	$3,642,703	2,410	$109	$262,920	7,540	$1,035	19,150	$118	7,100	$118	$10,894,942	33,790	36,200	$84,983,916	$619
2010	143,000	67,710	5,500	$1,097	73,210	$80,311,370	33,590	$113	33,590	$3,811,103	2,410	$113	$273,437	7,540	$1,085	19,150	$122	7,100	$122	$11,395,584	33,790	36,200	$95,791,494	$670
Total Volume	1,719,000	724,149	66,000		790,349		394,145				157,855			97,200		194,251		85,200			376,651	534,506		
Fraction of Total		42%	4%		46%		23%				9%			6%		11%		5%						
Total Cost						$605,726,384				$35,855,879			$11,807,430							$105,904,608			$759,294,301	
Fraction of Total						80%				5%			2%							14%				
Present Value																							$452,553,506	

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TABLE 8-3 (revised 9/7/94)
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 3 - AGRICULTURAL EXCHANGE, BLENDING, DEMINERALIZATION AND
30,000 ACRE-FT CONJUNCTIVE USE (ALL RECHARGE THROUGH SPREADING)

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Unit. Seasonal Water: Conj. Use	Imported Water: Unit. Seasonal Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Conj. Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization: Volume	Municipal Use of Groundwater: Demineralization: Rate	Municipal Use of Groundwater: Direct + Conj. Use: Volume	Municipal Use of Groundwater: Direct + Conj. Use: Rate	Municipal Use of Groundwater: Volume	Municipal Use of Groundwater: Blending: Rate	Municipal Use of Groundwater: Cost	Municipal Use of Groundwater: Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	0	$256	44,500	$20,203,000	8,900	$63	0	$0	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,500	0	$483	0	$278	47,500	$22,942,500	11,069	$66	0	$0	11,069	$725,241	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,281,460	$305
1997	86,000	47,140	0	$515	0	$304	47,140	$24,277,100	13,238	$68	0	$0	13,238	$902,048	19,762	$68	$1,346,598	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,644,978	$333
1998	89,000	50,140	0	$545	0	$319	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,839	17,593	$71	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
1999	92,000	2,724	5,500	$578	20,000	$338	28,224	$11,513,472	17,576	$74	10,000	$0	27,576	$1,295,370	15,424	$74	$1,136,766	7,540	$609	36,136	$80	7,100	$80	$8,031,300	50,776	66,200	$21,976,908	$239
2000	95,000	3,555	5,500	$613	20,000	$361	29,055	$12,774,715	19,745	$77	10,000	$0	29,745	$1,513,437	13,255	$77	$1,015,984	7,540	$627	38,305	$83	7,100	$83	$8,484,045	52,945	66,200	$23,788,181	$250
2001	99,000	5,386	5,500	$649	20,000	$389	30,886	$14,849,014	21,914	$80	10,000	$0	31,914	$1,746,877	11,086	$80	$883,722	7,540	$649	40,474	$86	7,100	$86	$8,986,808	55,114	66,200	$26,466,420	$267
2002	103,000	7,217	5,500	$688	20,000	$417	32,717	$17,093,296	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,252	7,540	$688	42,643	$89	7,100	$89	$9,638,691	57,283	66,200	$29,467,809	$286
2003	107,000	9,048	5,500	$730	20,000	$447	34,548	$19,557,320	26,252	$86	10,000	$0	36,252	$2,263,444	6,748	$86	$581,812	7,540	$730	44,812	$93	7,100	$93	$10,335,271	59,452	66,200	$32,737,846	$306
2004	111,000	10,879	5,500	$773	20,000	$477	36,379	$22,204,378	28,421	$90	10,000	$0	38,421	$2,548,473	4,579	$90	$410,593	7,540	$773	46,981	$97	7,100	$97	$11,062,661	61,621	66,200	$36,226,104	$326
2005	115,000	12,710	5,500	$820	20,000	$511	38,210	$25,142,468	30,590	$93	10,000	$0	40,590	$2,852,682	2,410	$93	$224,745	7,540	$820	49,150	$101	7,100	$101	$11,844,734	63,790	66,200	$40,064,630	$348
2006	120,600	18,110	5,500	$869	20,000	$545	43,610	$31,422,808	30,790	$97	10,000	$0	40,790	$2,986,187	2,410	$97	$233,735	7,540	$869	49,150	$105	7,100	$105	$12,440,672	63,790	66,200	$47,083,402	$390
2007	126,200	23,310	5,500	$921	20,000	$582	49,010	$38,363,837	30,990	$101	10,000	$0	40,990	$3,125,807	2,410	$101	$243,085	7,540	$921	49,150	$109	7,100	$109	$13,068,288	63,790	66,200	$54,801,017	$434
2008	131,800	28,910	5,500	$976	20,000	$621	54,410	$46,014,012	31,190	$105	10,000	$0	41,190	$3,271,819	2,410	$105	$252,808	7,540	$976	49,150	$113	7,100	$113	$13,727,946	63,790	66,200	$63,206,586	$480
2009	137,400	34,310	5,500	$1,035	20,000	$664	59,810	$54,477,596	31,390	$109	10,000	$0	41,390	$3,424,511	2,410	$109	$262,920	7,540	$1,035	49,150	$118	7,100	$118	$14,427,562	63,790	66,200	$72,592,590	$528
2010	143,000	39,710	5,500	$1,097	20,000	$708	65,210	$63,758,026	31,590	$113	10,000	$0	41,590	$3,584,184	2,410	$113	$273,437	7,540	$1,085	49,150	$122	7,100	$122	$15,069,509	63,790	66,200	$82,685,156	$578
Total Volume	1,719,000	385,349	66,000		240,000		691,349		373,145						157,855			97,200		554,251		85,200			736,651	894,506		
Fraction of Total		22%	4%		14%		40%		22%						9%			6%		32%		5%						
Total Cost								$451,919,843						$33,889,189			$11,807,430							$141,763,865			$639,380,327	
Fraction of Total								71%						5%			2%							22%				
Present Value																											$384,636,284	

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TABLE 8-4 (revised 9/7/94)
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 4 - AGRICULTURAL EXCHANGE, BLENDING, DEMINERALIZATION AND
50,000 ACRE-FT CONJUNCTIVE USE (80% RECHARGE THROUGH SPREADING, 20% RECHARGE THROUGH INJECTION)

Year	Demand	Imported Water: Treated Base Water: Direct Use	Treated Base Water: Blending	Treated Base Water: Rate	Unit Seasonal Water: Conj Use	Unit Seasonal Water: Rate	Treated Seasonal Water: Conj. Use	Treated Seasonal Water: Rate	Total: Imported Volume	Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Conj. Use	Reclaimed Water: Rate	Total Recl Water Use	Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization Volume	Demineralization Rate	Direct + Conj Use Volume	Direct + Conj Use Rate	Blending Volume	Blending Rate	Cost	Total Muni Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	0	$256		$309	44,500	$20,203,000	8,900	$63	0	$0	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,500	0	$483	0	$278		$332	47,500	$22,942,500	11,069	$66	0	$0	11,069	$725,241	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,281,460	$303
1997	86,000	47,140	0	$513	0	$304		$357	47,140	$24,277,100	13,238	$68	0	$0	13,238	$902,048	19,762	$68	$1,346,598	3,360	$376	2,500	$74	0	$74	$2,119,232	5,860	23,622	$28,644,978	$333
1998	89,000	50,140	0	$545	0	$319		$381	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,839	17,593	$71	$1,246,753	3,360	$392	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
1999	92,000	0	5,500	$578	21,362	$338	1,362	$408	28,224	$10,954,780	17,376	$74	10,000	$0	27,376	$1,293,370	15,424	$74	$1,136,766	7,540	$409	38,860	$80	7,100	$80	$8,247,996	53,500	66,924	$21,634,911	$233
2000	95,000	0	5,500	$613	21,777	$361	1,778	$436	29,055	$12,012,205	19,745	$77	10,000	$0	29,745	$1,513,437	13,255	$77	$1,015,984	7,540	$427	41,860	$83	7,100	$83	$8,778,158	56,500	69,755	$23,319,784	$243
2001	99,000	0	5,500	$649	22,693	$389	2,693	$465	30,886	$13,652,783	21,914	$80	10,000	$0	31,914	$1,746,877	11,086	$80	$883,722	7,540	$449	45,860	$86	7,100	$86	$9,450,228	60,500	71,586	$25,733,610	$260
2002	103,000	0	5,500	$688	23,609	$417	3,609	$496	32,717	$15,422,561	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,252	7,540	$688	49,860	$89	7,100	$89	$10,284,492	64,500	73,417	$28,442,875	$276
2003	107,000	0	5,500	$730	24,524	$447	4,524	$529	34,548	$17,368,898	26,252	$86	10,000	$0	36,252	$2,263,444	6,748	$86	$581,812	7,540	$730	53,860	$93	7,100	$93	$11,177,302	68,500	75,248	$31,391,455	$293
2004	111,000	0	5,500	$773	25,439	$477	5,440	$564	36,379	$19,457,314	28,421	$90	10,000	$0	38,421	$2,548,473	4,579	$90	$410,593	7,540	$773	57,860	$97	7,100	$97	$12,115,587	72,500	77,079	$34,531,966	$311
2005	115,000	0	5,500	$820	26,355	$511	6,355	$601	38,210	$21,784,477	30,590	$93	10,000	$0	40,590	$2,852,642	2,410	$93	$224,745	7,540	$820	61,860	$101	7,100	$101	$13,124,060	76,500	78,910	$37,987,985	$338
2006	120,600	0	5,500	$869	29,055	$545	9,055	$641	43,610	$26,423,415	30,790	$97	10,000	$0	40,790	$2,966,187	2,410	$97	$233,735	7,540	$869	67,260	$105	7,100	$105	$14,336,479	81,900	84,310	$43,979,816	$365
2007	126,200	3,310	5,500	$921	30,000	$582	10,000	$682	49,010	$32,588,651	30,990	$101	10,000	$0	40,990	$3,123,807	2,410	$101	$243,085	7,540	$921	69,150	$109	7,100	$109	$15,245,692	83,790	86,200	$51,203,235	$406
2008	131,800	8,910	5,500	$976	30,000	$621	10,000	$726	54,410	$39,970,938	31,190	$105	10,000	$0	41,190	$3,271,819	2,410	$105	$252,806	7,540	$976	69,150	$113	7,100	$113	$15,992,446	83,790	86,200	$59,488,012	$451
2009	137,400	14,310	5,500	$1,035	30,000	$664	10,000	$773	59,810	$48,148,719	31,390	$109	10,000	$0	41,390	$3,424,511	2,410	$109	$262,930	7,540	$1,035	69,150	$118	7,100	$118	$16,782,642	83,790	86,200	$68,618,794	$499
2010	143,000	19,710	5,500	$1,097	30,000	$708	10,000	$823	65,210	$57,129,354	31,590	$113	10,000	$0	41,590	$3,584,184	2,410	$113	$273,437	7,540	$1,085	69,150	$122	7,100	$122	$17,518,792	83,790	86,200	$78,503,767	$549
Total Volume	1,719,000	233,720	66,000		314,814		74,814		691,349		373,145						137,855			97,200		703,860		85,200			886,260	1,044,135		
Fraction of Total		14%	4%		18%		4%		40%		22%						9%			6%		41%		5%						
Total Cost										$409,664,995						$33,849,189			$11,807,430							$157,700,273			$613,061,887	
Fraction of Total										67%						6%			2%							26%				
Present Value																													$371,114,039	

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evaluation purposes, all the plan elements are assumed on line in 1999, that is, all elements would be implemented in five years. Actual implementation could take place over a longer period of time ranging from five to fifteen years. This analysis assumes an amortization period of 20 years, amortization rate of six percent and an inflation rate of four percent. Capital, operations and maintenance costs for recharge facilities, and blending facilities are not included. Salvage costs are not included for the wells and desalters.

Tables 8-1 through 8-4 list the annual cost of water supply and the total present value cost of the water supply plan with the implementation of a groundwater management plan. Similar costs are presented in Table 5-6 for a case without a groundwater management plan. The groundwater management plan alternatives are compared to the *no groundwater management plan case* in Table 8-5. The difference in costs between the *with management plan* cases and *without management plan* case occurs in years 1999 through 2010.

Alternative 1 - Agricultural Exchange and Blending groundwater management plan case has a present value savings of about $108,000,000 over the no groundwater management plan case illustrated in Table 5-6. The saving comes from the exchange of up to 17,500 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water.

Alternative 2 - Agricultural Exchange, Blending and Demineralization groundwater management plan is identical to Alternative 1 except that the agricultural exchange of groundwater production to municipal uses has been expanded to about 21,700 acre-ft/yr and municipal groundwater production has been expanded by about 4,200 acre-ft/yr through construction of a demineralization facility. Alternative 2 has a present value savings of about $104,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and is comparable to the cost of Alternative 1. The cost savings over the *no groundwater management plan case* come from the exchange of up to 21,600 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water. The cost of Alternative 2 is slightly higher than Alternative 1 because the demineralization costs are higher than the cost of imported water prior to 2010. After 2010 demineralization costs will be less than imported water. Alternative 2 would have costs savings greater than Alternative 1 if the economic analysis were extended beyond 2010.

TABLE 8-5 (revised 9/7/94)
COMPARISON OF GROUNDWATER MANAGEMENT PLAN ALTERNATIVES

Alternative	Percentage of Total Supply: Non Interruptible Treated Imported Water	Percentage of Total Supply: Seasonal Treated Imported Water	Percentage of Total Supply: Seasonal Untreated Imported Water	Size of Groundwater Management Plan Elements: Agricultural Exchange (acre-ft/yr)	Size of Groundwater Management Plan Elements: Blending (acre-ft/yr)	Size of Groundwater Management Plan Elements: Demineralization (acre-ft/yr)	Size of Groundwater Management Plan Elements: Conjunctive Use (acre-ft/yr)	Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
No Groundwater Management Plan	64%	0%	0%	0	0	0	0	$557,000,000	na
1 Agricultural Exchange and Blending	49%	0%	0%	17,510	7,100	0	0	$449,000,000	$108,000,000
2 Agricultural Exchange, Blending and Demineralization	46%	0%	0%	21,690	7,100	4,180	0	$453,000,000	$104,000,000
3 Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use (all recharge through spreading)	26%	0%	14%	21,690	7,100	4,180	30,000	$385,000,000	$172,000,000
4 Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use (80 recharge through spreading, 20 % through injection)	18%	4%	18%	21,690	7,100	4,180	50,000	$371,000,000	$186,000,000

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Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 2 plus the incorporation of 30,000 acre-ft/yr of conjunctive use. The source water for conjunctive use is 20,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the *no management plan case* to 26 percent. The demand for untreated seasonal water has risen to 14 percent. Treated non-interruptible and seasonal untreated imported water make up 40 percent of municipal supplies. Alternative 3 has a present value savings of about $172,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $66,000,000 over Alternatives 1 and 2. About 62 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due to conjunctive use.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 3 except that conjunctive use has been expanded from 30,000 to 50,000 acre-ft. The source water for conjunctive use is 40,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the no management plan case to 18 percent. Untreated seasonal water has risen to 18 percent and treated seasonal water to 4 percent. Treated non-interruptible, treated seasonal and seasonal untreated imported water make up 40 percent of municipal supplies. Treated seasonal water would be used for recharge by injection. Alternative 4 has a present value savings of about $186,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $80,000,000 over Alternatives 1 and 2. About 57 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due conjunctive use.

The groundwater management plan development costs and the costs of recharge of basins and blending facilities are not included in Tables 8-1 through 8-4. These costs could have a present value ranging from $50,000,000 to $70,000,000. The cost savings from implementation of any of these alternatives far exceed the cost of implementation. The projected cost savings from the groundwater management plan illustrated in Tables 8-1 through 8-4 are for the 15-year period of 1999 to 2010 in which the capital-intensive facilities, such as spreading basins, have been in operation (and amortized) for 11 years. If these analyses were extended to the period of time

over which capital-intensive facilities were to be financed, say 20 years, the cost saving would be significantly greater.

There are two additional significant benefits from a groundwater management plan. First, imported water for direct use has been reduced by half, which will improve overall water supply reliability. The volumetric impact of water shortages in the imported water supply could be reduced by half. Second, the recharge of state project water into the Lakeview, Perris North and Perris South subbasins will improve the quality of the groundwater in these subbasins.

The groundwater management alternatives illustrated in Tables 8-1 through 8-4 clearly show that the economic benefits, water supply reliability benefits and water quality benefits of a groundwater management plan are very significant. Tables 8-1 through 8-4 assume that the conjunctive use elements are operational in 1999. As mentioned above, it could take an additional five years (till 2004) to implement the large scale conjunctive use projects described in these examples. Other management elements, yield augmentation in particular, should also be included in the management plan. Cooperative efforts among the water users in the management area, and results of future engineering and economic studies will define which elements will ultimately be used in the management plan.

FINANCING THE GROUNDWATER MANAGEMENT PLAN

The primary beneficiaries of the plan are municipal water users in the West San Jacinto Groundwater Basin management area. Private groundwater producers such as farmers, dairy operators and individuals with small domestic wells will either be beneficially impacted or have no impacts. It is the intent of the plan to mitigate all significant adverse groundwater impacts to private groundwater producers. The types of beneficial impacts that private well owners could experience will be stabilized or increased groundwater levels where overdraft is currently occurring, such as the Lakeview subbasin, and reduced supply cost for those groundwater producers that can use reclaimed water in lieu of groundwater.

The cost of implementing and operating the West San Jacinto Groundwater Basin management plan should be born by municipal water users in the management area. The cost savings experienced by the local private groundwater users should be their incentive to participate in the groundwater management plan. There could be some cost to local groundwater producers if

groundwater replenishment is necessary due to groundwater overdraft. In the event of continued overdraft, an equitable cost sharing plan should be developed to correct the overdraft.

EMWD, acting as manager of the West San Jacinto Basin Groundwater Basin, will not levy and/or collect any rate, fee or charge from any groundwater producer unless authorized by law or contract with the producer, or in the event a producer extracts water stored in a basin by entities participating in the management plan. The plan will not require financial participation by any producer unless there is a consideration provided to such producer in the form of a quantifiable benefit to the producer.

The benefits and costs associated with the groundwater management plan should be accounted for locally, that is, by subbasin or some other geographic unit, to insure the benefits and costs are equitably distributed. The benefits to municipal users in the management area are essentially uniform throughout the management area and thus, the costs associated with those benefits should be distributed uniformly to all municipal water users in the management area. Localized benefits or costs to the Nuevo Water Company and the Edgemont Gardens Mutual Water Company should be estimated when the projects implemented by the groundwater management plan are better defined. EMWD and these agencies may need to develop adjustments in the cost of water supplied to these agencies by EMWD to compensate for localized benefits and costs to these agencies that are caused by the management plan.

Some of the elements of the management plan are capital intensive such as recharge facilities, wells, treatment plants, pipelines, etc. EMWD will need to develop a plan to finance these elements of the groundwater management plan with cost recovery based on the sale of water developed by the plan, or some other method as appropriate. The economic analysis presented previously in this section show that the management plan should easily pay for itself.

IMPLEMENTATION OF THE GROUNDWATER MANAGEMENT PLAN

Upon adoption of the groundwater management plan, EMWD will form the Advisory Committee and implement the groundwater management plan. The implementation of the groundwater management plan will occur in phases and consist of the following:

Phase 1 Short Term Implementation

Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 3 Ultimate Groundwater Management Plan Implementation

Phase 1 Short Term Implementation

The goals of the short term implementation phase are to: implement those elements of the groundwater management plan that are easy to implement, where existing information is adequate for implementation; and to develop and implement demonstration projects that will provide engineering information necessary for design of management elements in the ultimate plan. This phase consists of five tasks that are described below.

Task 1-1 Groundwater Resources Evaluation. Section 4 described what is currently known about the groundwater resources in the management area, based on available reports and data. Most of the water quality data and groundwater elevation data is fifteen to twenty years old. There are no definitive studies evaluating the feasibility of surface water recharge. A complete groundwater resource evaluation should be done to define the groundwater resources in the management area. This effort will include the following sub tasks.

Define the Hydrogeologic Characteristics of the basin including: geology; flow controlling features such as faults, barriers, aquicludes, effective base of the aquifer, and hydraulic conductivity. This will involve: review of existing well logs, new aquifer tests, drilling new test holes, and geophysical studies.

Describe Groundwater Quality Conditions Historical groundwater quality data will be mapped and reviewed. EMWD has recently collected and entered these data into a data base, which will greatly facilitate this effort. A completely new groundwater quality monitoring program will be conducted evaluating the groundwater quality for constituents described in Title 22, plus other constituents that could be regulated and constituents that can be used to understand the groundwater hydrology, such as isotopes of oxygen and hydrogen.

Describe the Occurrence of Groundwater including: groundwater levels, groundwater hydrology, volume of groundwater in storage, unused groundwater storage, and groundwater production and use. This will involve an extensive

groundwater level survey, and review/estimation of historical and future groundwater production.

Task 1-2 Develop Groundwater Management Policies. In this task EMWD, in cooperation with the Advisory Committee and participating groundwater producers, will develop policies for monitoring of groundwater production, monitoring groundwater level and quality, monitoring of well construction, well construction, well abandonment and destruction. Policies for the exchange of agricultural and other non-potable groundwater production to municipal use will be developed in this Task.

Task 1-3 Construct and Operate Demonstration Projects for Blending, Demineralization and Conjunctive Use. EMWD will evaluate the technical feasibility of blending, demineralization, irrigation with reclaimed water, and conjunctive use through small scale demonstration projects. The experience and data developed in this task will be used in subsequent tasks for design of large scale projects. The demonstration projects described in Section 7, or similar projects, will be constructed and operated. The feasibility of water harvesting will be evaluated.

Task 1-4 Develop Water Resources Planning Model. A water resources planning model will be used to evaluate the groundwater level response, groundwater quality response, water supply reliability, water supply quality and wastewater quality responses of the management plan. This model will be used to evaluate management plan alternatives in Phase 1 and in subsequent phases.

Task 1-5 Develop and Evaluate Feasibility Level Plans for the Management Plan Elements. The management elements and new management elements that arise from Tasks 1-1 and 1-2 efforts, will be combined and developed into alternatives. The capacity, size and operational characteristics of the management elements will be defined and analyzed using the data from Tasks 1-1, 1-3 and 1-4. An initial environmental study will be done to assess probable environmental impacts and help develop the scope of work for environmental studies in Phase 2.

Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 1 Short Term Implementation will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan. The complexity and cost for the analyses described below are dependent on the management plan elements included in the management plan. Phase 2 consists of four tasks that are described below.

Task 2-1 Prepare Facility and Operation Plans. This task will produce an initial set of facility and operational plans. The initial plans will be based on the results of Phase 1 and will be used in *Task 2-2 Prepare Project Specific Environmental Impact Report.* The initial facility and operational plans will include plans and cost opinions. The facility and operational plans will be modified in this task, based on the Task 2-2 effort to minimize undesirable environmental impacts and to include mitigation measures. The facility and operational plan will be finalized with the EIR prepared in Task 2-2. An optimum management plan will be developed that is consistent with the management plan goal and its constraints.

Task 2-2 Prepare Project Specific Environmental Impact Reports (EIR). EIR's will be prepared for the implementation of specific groundwater management elements that are developed in Phase 1. This Task consists of the following sub tasks.

> Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of the initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.
>
> Estimate Environmental Impacts and Develop Mitigation Plans. This work will include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans. This Task includes the evaluation of other environmental impacts such as construction related impacts, growth inducing impacts and cumulative impacts. Alternative facility and operational plans and mitigation measures will be developed in coordination with *Task 2-1 Prepare*

Facility and Operation Plans. This task includes the development of mitigation and mitigation monitoring plans.

Prepare and Distribute Draft EIR(s).

Conduct Meetings, Public Hearings and Respond to Comments.

Finalize EIR(s).

Task 2-3 Prepare Engineering Report for a Planned Recharge Project. California Department of Health Services is requiring that new projects that involve planned recharge of reclaimed water follow the proposed regulations for planned recharge projects. This has recently occurred in the Los Angeles Central Basin, the Chino Basin and in the Riverside-Colton Basins. The data and models developed in Phase 1 will be used to evaluate the hydraulic and water quality response from reclaimed water recharge. This task consists of the following subtasks.

Describe the Impacts from Reclaimed Water Recharge. This subtask includes estimating the impacts of wastewater recharge at the regional and local levels. The data and models developed in Phase I will be used to estimate the regional and local impacts. If warranted, the facility and operational plans will be revised and the impact analysis repeated.

Develop a Groundwater Production Management and Monitoring Plan. A groundwater production management and monitoring plan will be developed consistent with proposed DHS regulations. The implementation of this plan will be included in the EIR's developed in Task 2-2 and the institutional plan developed in Task 2-4.

Prepare Engineering Report.

Task 2-4 Institutional Planning. This task consists of institutional planning necessary for implementation of the groundwater management plan. The work will be iterative with the institutional plans and agreements evolving throughout Phase 2. This task consists of the following subtasks.

Describe Powers and Limitations of Entities Involved in Groundwater Management Plan. This subtask consists of identifying and describing the

statutory responsibilities, powers and limitations of participants, regulatory agencies and third party interests.

Describe Regulatory and Water Rights Implications of Groundwater Management Plan. This task consists of describing the existing and proposed regulatory limits and water rights implications of the groundwater management plan; and the development of institutional arrangements and agreements necessary for implementation of plan elements.

Conduct Economic Analysis of Groundwater Management Plan. The capital and operating costs of the groundwater management plan will be evaluated and updated throughout Phase 2. Using Task 2-1 results, the economic benefits and costs for participating entities and third parties will be evaluated. The results of the economic analysis will feed back to Task 2-1, providing the opportunity to optimize the groundwater management plan.

Develop Preliminary Financing Plan. Financing alternatives will be developed throughout the Phase 2 effort that will be consistent with the facilities described in Task 2-1 and the financing capabilities of the participating agencies.

Describe Institutional Arrangements Necessary to Implement Groundwater Management Plan. This subtask consists of finalizing alternative institutional arrangements for participation, facility construction, ownership and management, payment and collection of fees, etc..

Develop Agreements. This subtask consists of preparing draft agreements for all the agreements that will be necessary to implement the ultimate groundwater management plan.

Phase 3 Ultimate Groundwater Management Plan Implementation

The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of

funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Task 3-1 Prepare Final Design and Bid Documents. This task consists of final engineering, design and preparation of bid documents. The types of facilities that will be included are wells, pipelines, reservoirs, treatment facilities, and spreading basins.

Task 3-2 Prepare Project Specific Supplemental EIR's and Negative Declarations. This task consists of the preparation of supplemental project-specific EIR's and negative declarations (if applicable). These documents will be for specific elements in groundwater management plan projects that will include wells, pipelines and recharge facilities.

Task 3-3 Prepare Final Agreements. This task consists of developing and finalizing the agreements that allow the groundwater management plan to be constructed and operated.

Construction and Operation. Several series of tasks will need to be developed to describe the construction and operational process for the groundwater management plan elements that will actually be constructed.

MANAGEMENT AND MONITORING

The management and monitoring of the groundwater management plan will occur while the elements of ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by change conditions.

SCHEDULE AND COST

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three years. Phase 3 could take up to 10 years to complete with

some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 10 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

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REFERENCES

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APPENDIX A

A - 1

AB 3030 with AB 1152 Amendments

PART 2.75

GROUNDWATER MANAGEMENT

Chapter		Sectic
1.	General Provisions	1075
2.	Definitions	1075
3.	Groundwater Management Plans	1075
4.	Finances	1075
5.	Miscellaneous	1075

Part 2.75 was added by Stats.1992, c. 947 (A.B.3030), § 2.

Former Part 2.75, Groundwater Resources, consisting of §§ 10750 to 10767, was added by Stats.1991, c. 903 (A.B.255), § 1, and repealed by Stats.1992, c. 947 (A.B.3030), § 1.

CHAPTER 1

GENERAL PROVISIONS

Section	
10750.	Legislative findings, declarations and intent.
10750.2.	Application of part.
10750.4.	Adoption of groundwater management plan or program not required.
10750.6.	Authority of local agencies or watermaster to manage groundwater not affected.
10750.7.	Management by local agencies within service area of another agency, water corporation or mutual water company without agreement prohibitec application of section.
10750.8.	Management by local agencies withi service area of another agency witl out agreement prohibited; applica tion of section.
10750.9.	Groundwater management progran procedures to establish commence prior to January 1, 1993; completior amendment.
10750.10.	Other powers.

Chapter 1 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10750. Legislative findings, declarations and intent

The Legislature finds and declares that groundwater is a valuable natural resource in California, anc should be managed to ensure both its safe production and its quality. It is the intent of the Legislatur to encourage local agencies to work cooperatively to manage groundwater resources within thei jurisdictions.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.3. Application of part

(a) Subject to subdivision (b), this part applies to all groundwater basins in the state.

(b) This part does not apply to any portion of a groundwater basin that is subject to groundwater management by a local agency or a watermaster pursuant to other provisions of law or a court order, judgment, or decree, unless the local agency or watermaster agrees to the application of this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10750, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.4. Adoption of groundwater management plan or program not required

Nothing in this part requires a local agency overlying a groundwater basin to adopt or implement a groundwater management plan or groundwater management program pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.6. Authority of local agencies or watermaster to manage groundwater not affected

Nothing in this part affects the authority of a local agency or a watermaster to manage groundwater pursuant to other provisions of law or a court order, judgment, or decree.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.7. Management by local agencies within service area of another agency, water corporation or mutual water company without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

(b) This section applies only to groundwater basins that are not critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.8. Management by local agencies within service area of another agency without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency without the agreement of that other entity.

(b) This section applies only to groundwater basins that are critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.9. Groundwater management program; procedures to establish commenced prior to January 1, 1993; completion; amendment

(a) A local agency that commences procedures, prior to January 1, 1993, to adopt an ordinance or resolution to establish a program for the management of groundwater pursuant to Part 2.75 (commencing

with Section 10750), as added by Chapter 903 of the Statutes of 1991, may proceed to adopt the ordinance or resolution pursuant to * * * Part 2.75, and the completion of those procedures is deemed to meet the requirements of this part.

(b) A local agency that has adopted an ordinance or resolution pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may amend its groundwater management program by ordinance or resolution of the governing body of the local agency to include any of the plan components set forth in Section 10753.7.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 1.)

§ 10750.10. Other powers

This part is in addition to, and not a limitation on, the authority granted to a local agency pursuant to other provisions of law.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10766, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10751. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

The repealed section, added by Stats.1991, c. 903 (A.B. 255), § 1, set forth definitions. See, now, § 10752.

CHAPTER 2

DEFINITIONS

Section
10752. Definitions.

Chapter 2 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10752. Definitions

Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Groundwater" means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(b) "Groundwater basin" means any basin identified in the department's Bulletin No. 118, dated September 1975, and any amendments to that bulletin, but does not include a basin in which the average well yield is less than 100 gallons per minute.

(c) "Groundwater extraction facility" means any device or method for the extraction of groundwater within a groundwater basin.

(d) "Groundwater management plan" or "plan" means a document that describes the activities intended to be included in a groundwater management program.

(e) "Groundwater management program" or "program" means a coordinated and ongoing activity undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin, pursuant to a groundwater management plan adopted pursuant to this part.

(f) "Groundwater recharge" means the augmentation of groundwater, by natural or artificial means, with surface water or recycled water.

(g) "Local agency" means any local public agency that provides water service to all or a portion of its service area, and includes a joint powers authority formed by local public agencies that provide water service.

(h) "Recharge area" means the area that supplies water to an aquifer in a groundwater basin and includes multiple wellhead protection areas.

(i) "Watermaster" means a watermaster appointed by a court or pursuant to other provisions of law.

(j) "Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 2.)

Historical and Statutory Notes

1992 Legislation
Former § 10752 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.

Derivation: Former § 10751, added by Stats.1991, c. 903 (A.B.255) § 1.

CHAPTER 3. GROUNDWATER MANAGEMENT PLANS

Section	
10753.	Adoption or implementation of plan.
10753.2.	Hearing; notice; resolution of intention to adopt plan.
10753.3.	Publication of resolution of intention.
10753.4.	Preparation of plan; adoption; expiration of resolution of intention.
10753.5.	Second hearing; notice; protests to adoption of plan.
10753.6.	Written protest; contents; majority protest.
10753.7.	Plan components.
10753.8.	Rules and regulations to implement and enforce plan.
10753.9.	Potential impact of rules and regulations on business activities; consideration.

Chapter 3 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10753. Adoption or implementation of plan

(a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

(b) Notwithstanding subdivision (a), a local public agency, other than an agency defined in subdivision (g) of Section 10752, <u>that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service,</u> may exercise the authority of this part within a groundwater basin * * * <u>that is located within its boundaries within areas that are either of the following</u>:

(1) * * * <u>Not served</u> by a local agency.

(2) * * * <u>Served by a</u> local * * * agency * * * <u>whose governing body, by a majority vote, declines to exercise the authority of this part and enters into an agreement with the local public agency pursuant to Section 10750.7 or 10750.8</u>.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 3.)

Historical and Statutory Notes

1992 Legislation
Former § 10753 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.2.

Derivation: Former § 10752, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.2. Hearing; notice; resolution of intention to adopt plan

(a) Prior to adopting a resolution of intention to draft a groundwater management plan, a local agency shall hold a hearing, after publication of notice pursuant to Section 6066 of the Government Code, on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(b) At the conclusion of the hearing, the local agency may draft a resolution of intention to adopt a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10753, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.3. Publication of resolution of intention

(a) After the conclusion of the hearing, and if the local agency adopts a resolution of intention, the local agency shall publish the resolution of intention in the same manner that notice for the hearing held under Section 10753.2 was published.

(b) Upon written request, the local agency shall provide any interested person with a copy of the resolution of intention.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10754, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.4. Preparation of plan; adoption; expiration of resolution of intention

The local agency shall prepare a groundwater management plan within two years of the date of the adoption of the resolution of intention. If the plan is not adopted within two years, the resolution of intention expires, and no plan may be adopted except pursuant to a new resolution of intention adopted in accordance with this chapter.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.5. Second hearing; notice; protests to adoption of plan

(a) After a groundwater management plan is prepared, the local agency shall hold a second hearing to determine whether to adopt the plan. Notice of the hearing shall be given pursuant to Section 6066 of the Government Code. The notice shall include a summary of the plan and shall state that copies of the plan may be obtained for the cost of reproduction at the office of the local agency.

(b) At the second hearing, the local agency shall consider protests to the adoption of the plan. At any time prior to the conclusion of the second hearing, any landowner within the local agency may file a written protest or withdraw a protest previously filed.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10755, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.6. Written protest; contents; majority protest

(a) A written protest filed by a landowner shall include the landowner's signature and a description of the land owned sufficient to identify the land. A public agency owning land is deemed to be a landowner for the purpose of making a written protest.

(b) The secretary of the local agency shall compare the names and property descriptions on the protest against the property ownership records of the county assessors.

(c) (1) A majority protest shall be determined to exist if the governing board of the local agency finds that the protests filed and not withdrawn prior to the conclusion of the second hearing represent more than 50 percent of the assessed value of the land within the local agency subject to groundwater management pursuant to this part.

(2) If the local agency determines that a majority protest exists, the groundwater plan may not be adopted and the local agency shall not consider adopting a plan for the area proposed to be included within the program for a period of one year after the date of the second hearing.

(3) If a majority protest has not been filed, the local agency, within 35 days after the conclusion of the second hearing, may adopt the groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former §§ 10756, 10757, added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10753.7. Plan components

A groundwater management plan may include components relating to all of the following:

(a) The control of saline water intrusion.

(b) Identification and management of wellhead protection areas and recharge areas.

(c) Regulation of the migration of contaminated groundwater.

(d) The administration of a well abandonment and well destruction program.

(e) Mitigation of conditions of overdraft.

(f) Replenishment of groundwater extracted by water producers.

(g) Monitoring of groundwater levels and storage.

(h) Facilitating conjunctive use operations.

(i) Identification of well construction policies.

(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.

(k) The development of relationships with state and federal regulatory agencies.

(*l*) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.8. Rules and regulations to implement and enforce plan

(a) A local agency shall adopt rules and regulations to implement and enforce a groundwater management plan adopted pursuant to this part.

(b) Nothing in this part shall be construed as authorizing the local agency to make a binding determination of the water rights of any person or entity.

(c) Nothing in this part shall be construed as authorizing the local agency to limit or suspend extractions unless the local agency has determined through study and investigation that groundwater replenishment programs or other alternative sources of water supply have proved insufficient or infeasible to lessen the demand for groundwater.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.9. Potential impact of rules and regulations on business activities; consideration

In adopting rules and regulations pursuant to Section 10753.8, the local agency shall consider the potential impact of those rules and regulations on business activities, including agricultural operations, and to the extent practicable and consistent with the protection of the groundwater resources, minimize any adverse impacts on those business activities.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

CHAPTER 4

FINANCES

Section	
10754.	Local agencies; water replenishment district powers; fees and assessments.
10754.2.	Annual fees and assessments based on amount of groundwater extracted; payment of costs; remediation program excluded.
10754.3.	Elections to authorize assessments or fees.

Chapter 4 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10754. Local agencies; water replenishment district powers; fees and assessments

For purposes of groundwater management, a local agency that adopts a groundwater management plan pursuant to this part has the authority of a water replenishment district pursuant to Part 4 (commencing

with Section 60220) of Division 18 and may fix and collect fees and assessments for groundwater management in accordance with Part 6 (commencing with Section 60300) of Division 18.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation
Former § 10754 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.3.

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.2. Annual fees and assessments based on amount of groundwater extracted; payment of costs; remediation program excluded

(a) Subject to Section 10754.3, except as specified in subdivision (b), a local agency that adopts a groundwater management plan pursuant to this part, may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted from the groundwater basin within the area included in the groundwater management plan to pay for costs incurred by the local agency for groundwater management, including, but not limited to, the costs associated with the acquisition of replenishment water, administrative and operating costs, and costs of construction of capital facilities necessary to implement the groundwater management plan.

(b) The local agency may not impose fees or assessments on the extraction and replacement of groundwater pursuant to a groundwater remediation program required by other provisions of law <u>or a groundwater storage contract with the local agency</u>.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 4.)

Historical and Statutory Notes

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.3. Elections to authorize assessments or fees

Before a local agency may levy a water management assessment pursuant to Section 10754.2 or otherwise fix and collect fees for the replenishment or extraction of groundwater pursuant to this part, the local agency shall hold an election on the proposition of whether or not the local agency shall be authorized to levy a groundwater management assessment or fix and collect fees for the replenishment or extraction of groundwater. The local agency shall be so authorized if a majority of the votes cast at the election is in favor of the proposition. The election shall be conducted in the manner prescribed by the laws applicable to the local agency or, if there are no laws so applicable, then as prescribed by laws relating to local elections. The election shall be conducted only within the portion of the jurisdiction of the local agency subject to groundwater management pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10761, added by Stats.1991, c. 903 (A.B.255), § 1.

CHAPTER 5

MISCELLANEOUS

Section	
10755.	Annexed land; compliance with plan.
10755.2.	Coordinated plans for local agencies within same groundwater basin; joint powers agreements; agreements with public entities or private parties.
10755.3.	Meetings to coordinate plans.
10755.4.	Limitation on application of part.

Chapter 5 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10755. Annexed land; compliance with plan

(a) If a local agency annexes land subject to a groundwater management plan adopted pursuant to this part, the local agency annexing the land shall comply with the groundwater management plan for the annexed property.

(b) If a local agency subject to a groundwater management plan adopted pursuant to this part annexes land not subject to a groundwater management plan adopted pursuant to this part at the time of annexation, the annexed territory shall be subject to the groundwater management plan of the local agency annexing the land.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10755 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.5.

Derivation: Former § 10764, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10755.2. Coordinated plans for local agencies within same groundwater basin; joint powers agreements; agreements with public entities or private parties

(a) It is the intent of the Legislature to encourage local agencies, within the same groundwater basin, that are authorized to adopt groundwater management plans pursuant to this part, to adopt and implement a coordinated groundwater management plan.

(b) For the purpose of adopting and implementing a coordinated groundwater management program pursuant to this part, a local agency may enter into a joint powers agreement pursuant to Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code with public agencies, or a memorandum of understanding with public or private entities providing water service.

(c) A local agency may enter into agreements with public entities or private parties for the purpose of implementing a coordinated groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), §5.)

Historical and Statutory Notes

Derivation: Former §§ 10758, 10763 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10755.3. Meetings to coordinate plans

Local agencies within the same groundwater basin that conduct groundwater management programs within that basin pursuant to this part shall, at least annually, meet to coordinate those programs.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10755.4. Limitation on application of part

Except in those groundwater basins that are subject to critical conditions of groundwater overdraft, as identified in the department's Bulletin 118-80, revised on December 24, 1982, the requirements of a groundwater management plan that is implemented pursuant to this part do not apply to the extraction of groundwater by means of a groundwater extraction facility that is used to provide water for domestic purposes to a single-unit residence and, if applicable, any dwelling unit authorized to be constructed pursuant to Section 65852.1 or 65852.2 of the Government Code.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§§ 10756 to 10767. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

Sections 10756 and 10757, see, now, § 10753.6.

Section 10758, see, now, § 10755.2.

Sections 10759 and 10760, see, now, §§ 10754 and 10754.2.

Section 10761, see, now, § 10754.3.

Section 10762, see, now, §§ 10750.7 and 10750.8.

Section 10763, see, now, § 10755.2.

Section 10764, see, now, § 10755.

Section 10766, see, now, § 10750.10.

A - 2

Proposed Regulation: Title 22, California Code of Regulations
Division 4. Environmental Health, Chapter 3 Reclamation Criteria

PROPOSED REGULATION:

Title 22, CALIFORNIA CODE OF REGULATIONS

DIVISION 4. ENVIRONMENTAL HEALTH

CHAPTER 3. RECLAMATION CRITERIA

ARTICLE 1. DEFINITIONS

Section 60301. Definitions.

(a) **Reclaimed Water.** Reclaimed water means water which, as a result of treatment of domestic wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.

(b) **Reclamation Plant.** Reclamation plant means an arrangement of devices, structures, equipment, processes and controls which produce a reclaimed water suitable for the intended reuse.

(c) **Regulatory Agency.** Regulatory agency means the California Regional Water Quality Control Board in whose jurisdiction the reclamation plant is located.

(d) **Direct Beneficial Use.** Direct beneficial use means the use of reclaimed water which has been transported from the point of production to the point of use without an intervening discharge to waters of the State.

(e) **Food Crops.** Food crops mean any crops intended for human consumption.

(f) **Spray Irrigation.** Spray irrigation means application of reclaimed water to crops by spraying it from orifices in piping.

(g) **Surface Irrigation.** Surface irrigation means application of reclaimed water by means other than spraying such that contact between the edible portion of any food crop and reclaimed water is prevented.

(h) **Restricted Recreational Impoundment.** A restricted recreational impoundment is a body of reclaimed water in which recreation is limited to fishing, boating, and other non-body-contact water recreation activities.

(i) **Nonrestricted Recreational Impoundment.** A nonrestricted recreational impoundment is an impoundment of reclaimed water in which no limitations are imposed on body-contact water sport activities.

(j) **Landscape Impoundment.** A landscape impoundment is a body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include public contact.

(k) **Approved Laboratory Methods.** Approved laboratory methods are those specified in the latest edition of "Standard Methods for the Examination of Water and Wastewater," prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control

Federation and which are conducted in laboratories approved by the State Department of Health.

(l) **Unit Process.** Unit process means an individual stage in the wastewater treatment sequence which performs a major single treatment.

(m) **Primary Effluent.** Primary effluent is the effluent from a wastewater treatment process which provides removal of sewage solids so that it contains not more than 0.5 milliliter per liter per hour of settleable solids as determined by an approved laboratory method.

(n) **Oxidized Wastewater.** Oxidized wastewater means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

(o) **Biological Treatment.** Biological treatment means methods of wastewater treatment in which bacterial or biochemical action is intensified as a means of producing an oxidized wastewater.

(p) **Secondary Sedimentation.** Secondary sedimentation means the removal by gravity of settleable solids remaining in the effluent after the biological treatment process.

(q) **Coagulated Wastewater.** Coagulated wastewater means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated by the addition of suitable floc-forming chemicals or by an equally effective method.

(r) **Filtered Wastewater.** Filtered wastewater means an oxidized, coagulated, clarified wastewater which has been passed through natural undisturbed soils or filter media, such as sand or diatomaceous earth, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 turbidity units and does not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(s) **Disinfected Wastewater.** Disinfected wastewater means wastewater in which the pathogenic organisms have been destroyed by chemical, physical or biological means.

(t) **Multiple Units.** Multiple units means two or more units of a treatment process which operate in parallel and serve the same function.

(u) **Standby Unit Process.** A standby unit process is an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment for the entire design flow of the unit for which it is a substitute.

(v) **Power Source.** Power source means a source of supplying energy to operate unit processes.

(w) **Standby Power Source.** Standby power source means an automatically actuated self-starting alternate energy source maintained in immediately operable condition and of sufficient

capacity to provide necessary service during failure of the normal power supply.

(x) **Standby Replacement Equipment.** Standby replacement equipment means reserve parts and equipment to replace broken-down or worn-out units which can be placed in operation within a 24-hour period.

(y) **Standby Chlorinator.** A standby chlorinator means a duplicate chlorinator for reclamation plants having one chlorinator and a duplicate of the largest unit for plants having multiple chlorinator units.

(z) **Multiple Point Chlorination.** Multiple point chlorination means that chlorine will be applied simultaneously at the reclamation plant and at subsequent chlorination stations located at the use area and/or some intermediate point. It does not include chlorine application for odor control purposes.

(aa) **Alarm.** Alarm means an instrument or device which continuously monitors a specific function of a treatment process and automatically gives warning of an unsafe or undesirable condition by means of visual and audible signals.

(bb) **Person.** Person also includes any private entity, city, county, district, the State or any department or agency thereof.

(cc) **Direct Injection.** The controlled subsurface addition of water directly into the groundwater basin that results in the

replenishment of groundwater used or suitable for use as a source of domestic water supply.

(dd) **General Mineral.** Water analyses for bicarbonate, carbonate, and hydroxide alkalinity, calcium, chloride, copper, foaming agents, iron, magnesium, manganese, pH, sodium, sulfate, specific conductance, total dissolved solids, total hardness, and zinc.

(ee) **General Physical.** Water analyses for color and odor.

(ff) **Initial Percolative Capacity.** The rate (unit volume per unit area per unit time or unit length per unit time) at which water moves through the soil prior to recharge conditions.

(gg) **Organics Removal.** Granular activated carbon adsorption or reverse osmosis treatment designed to remove organic compounds from the reclaimed water.

(hh) **Planned Groundwater Recharge Project.** Any water reclamation project designed for the purpose of recharging groundwater suitable for use as a source of domestic water supply.

(ii) **Project Category I.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(jj) **Project Category II.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, and disinfected.

(kk) **Project Category III.** A surface spreading recharge project which uses reclaimed water that has been oxidized and disinfected.

(ll) **Project Category IV.** A direct injection recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(mm) **Project Sponsor.** An agency or agencies that receives from a Regional Water Quality Control Board water reclamation requirements for a planned groundwater recharge project.

(nn) **Surface Spreading.** The controlled application of water to the ground surface for the purpose of replenishing groundwater used or suitable for use as a source of domestic water supply.

(oo) **Total Organic Carbon (TOC).** The oxidizable organic carbon present in the reclaimed water measured by the methods prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation in Section 5310 of the 17th edition of Standard Methods for the Examination of Water and Wastewater and which are conducted in laboratories approved by the State Department of Health Services.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

ARTICLE 5.1. GROUNDWATER RECHARGE

~~Section 60320. Groundwater Recharge.~~

~~(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.~~

~~(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, and distance to withdrawal.~~

~~(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.~~

Section 60320.01. Planned Groundwater Recharge Projects.

(a) This article shall apply only to planned groundwater recharge projects using reclaimed water. The creation or operation of recharge facilities to cause the infiltration or

injection of reclaimed water into a groundwater basin is evidence of a planned groundwater recharge project.

(b) A wastewater disposal project which is not designed for groundwater recharge, but which incidentally results in portions of the treated wastewater reaching groundwater or discharging to an ephemeral stream, is not covered by this article.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.02. Source Control.

All reclaimed water used for planned groundwater recharge projects shall be from a wastewater collection system operating under a comprehensive program for the control of discharge of toxic wastes from point sources, which is approved by the Regional Water Quality Control Board.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.03. Treatment Requirements and Performance Standards.

(a) Reclaimed water used for planned groundwater recharge projects shall comply with the following treatment requirements and treatment performance standards. Monitoring requirements and the basis for determining compliance with treatment performance standards are specified in Section 60320.06.

(1) Oxidized Wastewater.

Oxidized wastewater is required for all project categories. The oxidized wastewater prior to recharge shall not exceed 20 milligrams per liter (mg/L) total organic carbon (TOC), 30 mg/L suspended solids (SS), and 30 mg/L biochemical oxygen demand (BOD).

(2) Filtered Wastewater.

(A) Filtered wastewater is required for project categories I, II, and IV.

(B) The turbidity of the filtered wastewater prior to recharge shall not exceed an average of 2 turbidity units.

(C) The turbidity of the filtered wastewater prior to recharge shall not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(3) Disinfected Wastewater.

(A) Disinfected wastewater is required for all project categories.

(B) For project categories I, II, and IV, the median number of total coliform organisms in the disinfected wastewater shall not exceed 2.2 per 100 milliliters (mL). The number of total coliform organisms shall not exceed 23 per 100 mL in more than one sample within any 30-day period.

(C) For project category III, the median number of total coliform organisms in the disinfected wastewater shall not exceed 23 per 100 mL. The number of total coliform organisms shall not exceed 240 per 100 mL in more than one sample within any 30-day period.

(4) Organics Removal.

Reclaimed water used for project categories I and IV shall be subjected to organics removal. The TOC in the wastewater prior to recharge shall be reduced to the concentration specified in Table 1 as identified by the reclaimed water contribution to any affected domestic water supply well and by project category. The entire reclaimed water stream used for project category IV shall be subjected to organics removal.

Table 1. Maximum Allowable TOC after Organics Removal

Reclaimed Water Contribution (%)	Maximum TOC (mg/L)	
	Surface Spreading (Category I)	Direct Injection (Category IV)
0-20	20	5
21-25	16	4
26-30	12	3
31-35	10	3
36-45	8	2
46-50	6	2

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.04. Reclaimed Water Quality Requirements.

(a) The level of general physical characteristics, radioactivity, and the concentration of general mineral, inorganic chemicals (excepr nitrogen compounds), and organic chemicals in the reclaimed water prior to recharge shall not exceed the maximum contaminant levels specified in Chapter 15, Sections 64435, 64443, 64444.5, and 64473.

(b) The total nitrogen concentration of the reclaimed water shall not exceed a standard of 10 mg/L as nitrogen unless the project sponsor demonstrates that the standard can be consistently met prior to reaching the groundwater level.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.05. Recharge Site Requirements.

(a) Maximum Reclaimed Water Contribution.

(1) For project categories II and III, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 20 percent of the total flow.

(2) For project categories I and IV, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 50 percent of the total flow.

(3) Calculation of the percent in section 60320.05(a)(1 and 2) shall be based upon the reclaimed water contribution of all planned groundwater recharge projects affecting the basin.

(b) Minimum Depth-To-Groundwater Requirement.

(1) Planned groundwater recharge projects using surface spreading shall meet the minimum depth-to-groundwater requirements specified in Table 2 by project category and initial percolative capacity.

(2) Planned groundwater recharge projects shall not be allowed where the initial percolative capacity exceeds 0.3 in/min.

(3) The initial percolative capacity shall be determined once by representative testing of the spreading area prior to the start of groundwater recharge and shall reflect conditions throughout the required depth to groundwater. The testing procedure and results shall be described in the engineering report submitted pursuant to Section 60320.07.

(A) For existing surface spreading basins using reclaimed water or other waters, the initial percolative capacity shall be determined at least 14 days after the basins which make up a spreading area have been drained and at least 24 hours after pre-recharge conditions have been restored in the bottom of the basin.

(B) For proposed surface spreading basins, the initial percolative capacity shall be determined in a prototype basin or basins.

Table 2. Minimum Required Depth-to-Groundwater for Surface Spreading Groundwater Recharge Projects

	Minimum Depth-to-Groundwater (ft)		
Initial Percolative Capacity (in/min)	Project Category		
	I	II	III
<0.2	10	10	20
<0.3	20	20	50

(c) Minimum Retention Time Underground and Horizontal Separation Requirements.

(1) Reclaimed water shall be retained underground a minimum of 6 months prior to being withdrawn at a domestic water supply well for project categories I and II.

(2) Reclaimed water shall be retained underground a minimum of 12 months prior to being withdrawn at a domestic water supply well for project categories III and IV.

(3) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic

water supply well shall be 500 feet for project categories I and II.

(4) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic water supply well shall be 1000 feet for project category III.

(5) The minimum horizontal separation between the point where reclaimed water is applied by direct injection and a domestic water supply well shall be 2000 feet for project category IV.

(6) The project sponsor shall prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation pursuant to Section 60320.05 (c)(1-5).

(d) Monitoring Wells.

Monitoring wells shall be provided to detect the influence of the recharge operation. As a minimum, monitoring wells shall be located at points one-quarter and one-half of the distance (plus or minus 10%) from the recharge area to the nearest domestic water supply well. The number and location of the proposed monitoring wells shall be described in the engineering report submitted pursuant to Section 60320.07.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.06. Monitoring and Compliance.

(a) Treatment Performance Standards.

(1) **Oxidized Wastewater.** For all project categories, the BOD, SS, and TOC concentration of the oxidized wastewater shall be determined from 24-hour composite samples. Compliance with Section 60320.03(a)(1) shall be determined monthly for each constituent by averaging the results of all samples collected during the month and comparing the average to the standard in Section 60320.03(a)(1).

(A) The BOD samples for all project categories shall be collected at least weekly.

(B) The SS samples for all project categories shall be collected at least daily.

(C) The TOC samples for project categories II and III shall be collected at least daily.

(D) The TOC samples for project categories I and IV shall be collected at least weekly.

(2) **Filtered Wastewater.** For project categories I, II, and IV, the turbidity of the filtered wastewater shall be continuously measured and recorded.

(A) Turbidity measurements shall be read at least once every 4 hours. Compliance with the average operating turbidity pursuant to Section 60320.03(a)(2)(B) shall be

determined monthly by averaging the results of all turbidity samples read during the month and comparing the average to the turbidity standard in Section 60320.03(a)(2)(B).

(B) The turbidity record shall be read daily. Compliance with the high turbidity duration standard pursuant to Section 60320.03(a)(2)(C) shall be determined monthly by determining the highest percent of a day during the month that the filtered wastewater exceeded 5 turbidity units and comparing that percent to the standard in Section 60320.03(a)(2)(C).

(3) **Disinfected Wastewater.** For all project categories, bacteriological samples shall be collected and tested for coliform to monitor the performance of the disinfection process each day reclaimed water is produced for planned groundwater recharge projects. Compliance with the disinfected wastewater requirements pursuant to Section 60320.03(a)(3) shall be determined daily by determining the median coliform result of the last 7 days for which analyses have been completed and comparing that median to the appropriate coliform standard in Section 60320.03(a)(3).

(4) **Organics Removal.** For project categories I and IV the TOC concentration in the wastewater after the organics removal process shall be determined daily from 24-hour composite samples. Compliance with the organics removal requirement pursuant to Section 60320.03(a)(4) shall be determined daily

by averaging daily TOC concentrations for the last 90 days of operation and comparing that average to the appropriate maximum TOC concentration in Section 60320.03(a)(4).

(b) Reclaimed Water Quality.

(1) On a quarterly basis, grab or 24-hour composite samples of reclaimed water shall be collected and analyzed for the general mineral and general physical constituents listed in subsections 64433(1) and (2), for the inorganic chemicals (except nitrogen compounds) listed in Section 64435 (Table 2), and for gross alpha and gross beta. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64473 (Table 6), Section 64435 (Table 2), and Section 64443 (Table 4).

(2) On a quarterly basis, grab samples of reclaimed water shall be collected and analyzed for the organic chemicals in Table 5, Section 64444.5. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64444.5 (Table 5).

(3) On a weekly basis, grab or 24-hour composite samples shall be collected and analyzed for total nitrogen. Compliance with Section 60320.04(b) shall be determined annually by averaging the results of all samples collected

during the previous 12 months and comparing the average to the total nitrogen standard in Section 60320.04(b).

(c) Recharge Site Requirements.

(1) Maximum Reclaimed Water Contribution.

(A) The reclaimed water contribution, pursuant to Sections 60320.03(a)(4) and 60320.05(a), shall be determined annually and at the domestic water supply well which receives the highest percentage of reclaimed water. The method used for the annual determination shall be described in the engineering report pursuant to Section 60320.07. Compliance with the maximum reclaimed water contribution shall be determined by averaging the last five annual determinations of reclaimed water contribution and comparing that average to the appropriate maximum percent contribution in Section 60320.05(a).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services that the maximum reclaimed water contribution pursuant to Section 60320.05(a) will not be exceeded.

(2) Minimum Depth-to-Groundwater Requirement.

(A) The depth-to-groundwater shall be measured every day reclaimed water is present in the spreading basin.

Compliance with Section 60320.05(b) shall be determined daily by averaging the previous 30 daily depth-to-groundwater measurements taken when reclaimed water was present in the spreading basin and comparing the result to the appropriate standard in Table 2.

(B) When the average depth-to-groundwater is less than the depth-to-groundwater requirement pursuant to Section 60320.05(b), the discharge of reclaimed water onto the spreading basin shall be halted until the depth-to-groundwater measurement exceeds the required depth-to-groundwater pursuant to Section 60320.05(b).

(C) The depth-to-groundwater shall be measured at at least one monitoring well located at each spreading basin. The location of this well shall be specified in the engineering report pursuant to Section 60320.07. The monitoring well shall be sited so that the groundwater level is measured at a point where it is closest to the bottom of the spreading basin.

(3) Minimum Retention Time Underground and Horizontal Separation Requirements.

(A) The retention time underground, pursuant to Section 60320.05(c), shall be determined annually and at the domestic water supply well in which the reclaimed water has the shortest retention time underground. The method used for the annual determination shall be described in the

engineering report pursuant to Section 60320.07. Compliance with the minimum retention time underground shall be determined by averaging the last five annual determinations of retention time and comparing that average to the appropriate retention time in Section 60320.05(c).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and Department of Health Services that the minimum retention time underground pursuant to Section 60320.05(c) will not be exceeded.

(C) Compliance with the horizontal separation requirement pursuant to Section 60320.05(c) for surface spreading and direct injection projects shall be determined by taking field measurements of the shortest distance between a point of recharge and a domestic water supply well. In no case shall the distance be less than the horizontal separation requirement pursuant to Section 60320.05(c).

(d) Monitoring Well Requirements.

Samples shall be collected from monitoring wells at least quarterly and analyzed for TOC and total nitrogen.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.07. Engineering Report.

(a) Any project sponsor proposing a groundwater recharge project using reclaimed water shall submit an engineering report on the proposed groundwater recharge project to the regulatory agency. The report shall be prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, in conjunction with a geologist, experienced in hydrogeology and registered in California.

(b) Groundwater recharge projects not in operation by January 1, 1993, shall not recharge reclaimed water until the project sponsor submits a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services. For direct injection projects, the Department will not schedule a hearing pursuant to section 13540, Article 6, until a complete engineering report has been received by the Department.

(c) For existing groundwater recharge projects, project sponsors have five years from January 1, 1993 to submit a completed engineering report to the Regional Water Quality control Boards and Department of Health Services.

(d) For existing and proposed groundwater recharge projects, the engineering report shall consist of a thorough investigation and evaluation of the groundwater recharge project, impacts on the existing and potential uses of the impacted groundwater basin, and proposed means for achieving compliance with Sections

60320.01 to 60320.06. The engineering report shall include, but not be limited to the following:

(1) An engineering plan of the reclamation plant, transmission facilities, spreading basins/direct injections wells, and monitoring wells.

(2) A physical description of the proposed groundwater recharge project.

(3) A hydrogeologic study on the impacted groundwater basin. The study shall describe the impact of the recharge project on domestic groundwater sources. The study shall describe the source, area of recharge, quantity, quality, and groundwater flow patterns of all basin recharge waters. The study shall identify all quantities and sources of water used to determine the percent reclaimed water contribution. The study shall identify the aquifer zone in which the maximum allowed reclaimed water contribution is not met pursuant to Section 60320.05(a). The study shall identify the aquifer zone in which the provided organics removal is not sufficient for the reclaimed water contribution to the groundwater pursuant to Section 60320.03(a)(4). The study shall identify all wells that will be impacted by the proposed project and describe the groundwater quality in the impacted basin. The study shall identify the well(s) subject to the highest reclaimed water contribution and shortest reclaimed water retention time. The study shall also include quantitative

descriptions of the soil, soil layers, infiltration rates, aquifer transmissivity, groundwater movement, historic depth-to-groundwater, safe yield of the basin, and usable storage capacity of the basin.

(4) A description of the operational and management personnel, their qualifications, experience, and responsibilities.

(5) A description of how the project will be operated to comply with the recharge site requirements of maximum reclaimed water contribution, minimum depth-to-groundwater, horizontal separation, and retention time underground pursuant to Section 60320.05 (b and c).

(6) Identification of the agency responsible for preventing the use of groundwater for drinking water within certain areas pursuant to Section 60320.05 (c)(6), and the mechanism that will be used.

(7) A contingency plan for redirection of reclaimed water when treatment performance standards or depth-to-groundwater requirements are not met.

(8) A description of the methods of determination and results for initial percolative capacity, maximum reclaimed water contribution, minimum retention time underground, and horizontal separation.

(9) The number and location of monitoring wells in the spreading basin and groundwater basin.

(10) A plan for the monitoring well network to monitor groundwater flow and water quality in the impacted groundwater basin.

(11) A water quality monitoring plan for the treated wastewater, reclaimed water, and monitoring wells.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.08. Alternatives.

(a) Alternatives to the recharge site requirements specified in Section 60320.05 (b) and (c) (2, 4, and 5), or the treatment performance standards specified in Section 60320.03 (a)(1 to 4) may be allowed if the project sponsor demonstrates to the regulating agency that the proposed alternative reliably achieves an equal degree of public health protection. Alternatives may not be used to reduce the retention time below 6 months in Section 60320.05 (c)(2) or the horizontal separation below 500 feet in Section 60320.05 (c)(4 and 5). Alternatives to Sections 60320.01 to 60320.07, inclusive, shall not be allowed, unless the planned groundwater recharge projects meet the requirements of Section 60320.08 (b to e) or 60320.09

(b) Alternatives to achieve a disinfected and filtered wastewater pursuant to Section 60320.03(a)(2) and (a)(3)(B and C)

shall be accepted if the project sponsor demonstrates to the regulating agency that the alternatives reliably provide an equal degree of public health protection. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(c) Alternatives to the granular activated carbon or reverse osmosis treatment processes shall be accepted if the project sponsor demonstrates to the regulating agency that the organics removal treatment performance standards pursuant to Section 60320.03 (4) can be reliably met. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(d) The results of any alternative demonstration shall be presented in a complete report prepared and signed by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply. Such alternatives shall not be accepted until the Regional Water Quality Control Boards and the Department of Health Services have reviewed the reports.

(e) Within 60 days following the first full year of operation of any alternative approved by the regulating agency, the project

sponsor shall submit an report, prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, describing the effectiveness of the plant operation. The report shall include results of all water quality tests performed and shall evaluate compliance with established performance standards under actual operating conditions. It shall also include an assessment of problems experienced, corrective actions needed, and a schedule for providing needed improvements.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.09. Research and Demonstration Projects.

The maximum percentage reclaimed water contribution in the total flow extracted from any domestic water supply well pursuant to Section 60320.05(a)(2) shall not apply to a project which the Department has designated as a research and demonstration project for the purpose of conducting special monitoring, treatment, health effects, or other research studies.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

A - 3

Drinking Water Standards and Health Advisories Table

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
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DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

DECEMBER 1993

DRINKING WATER AND GROUNDWATER PROTECTION BRANCH

Contact: Bruce Macler, Regional Toxicologist, (415) 744-1884

REGION 9 DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

The USEPA Region 9 Drinking Water Standards and Health Advisories Table is a compendium of numerical standards, advisories and related information for chemicals and other contaminants which may be found in ground and surface waters. It provides a comprehensive listing of all current and proposed National Primary Drinking Water Regulations (NPDWRs), specific Maximum Contaminant Levels (MCLs) for California, Arizona and Hawaii, and California Drinking Water Action Levels. Where available, it includes USEPA Integrated Risk Information System (IRIS) cancer risk levels and oral reference dose (RfD) values, and USEPA Office of Ground Water and Drinking Water (OGWDW) Health Advisories for drinking water contaminants.

In order to make this table a manageable size, very few explanations or caveats for the values are included in the body of the table. Because of this, and the fact that background documentation and understanding of the derivation of specific values are critical to the proper use of this information, this table should not be used as a sole source of information for decision making. While the Appendix contains brief explanations of the different standards, criteria and advisories, consideration must be given to the context in which these numbers will be used. The appropriate reference materials should be consulted to determine the applicability of the number being considered. Some references are listed in the Appendix.

The values in this table are current to the publication date, but are subject to change. The user is advised to contact Bruce Macler, Regional Toxicologist, USEPA Region 9, at (415) 744-1884, if questions arise regarding current values.

INFORMATION IN THIS TABLE

The information for specific contaminants in this table is arranged by contaminant type. Inorganic chemicals are listed first, followed by radionuclides, organic chemicals, microbial contaminants and water quality factors.

For each contaminant, any applicable or proposed USEPA National Primary Drinking Water Regulation is listed. These include the enforceable **Maximum Contaminant Levels (MCLs)**, the health-based **Maximum Contaminant Level Goals (MCLGs)**, and the aesthetics-based **Secondary MCLs**. A given contaminant may have both a MCL and a Secondary MCL, as well as a MCLG. The regulatory status of these values is indicated. **Proposed MCLs or MCLGs** have been formally proposed by USEPA, but not promulgated. **Final MCLs or MCLGs** have been promulgated, but are not yet effective as of the

publication date. The effective date, if available, is indicated. **Current MCLs or MCLGs** are in effect.

In addition to regulatory information, health risk information is provided in the table. Data from IRIS for cancer and non-cancer health effects associated with drinking water contaminants is listed. The **RfD** is the daily oral intake (on a body weight basis) that is below the level USEPA believes to be without adverse, non-cancer health risks (i.e., zero risk). The IRIS **10^{-6} risk level** is that contaminant concentration (in ug/liter) in drinking water that might yield no greater than an additional risk of one-in-a-million (10^{-6}) after a lifetime of drinking that water. The USEPA OGWDW Health Advisories provide information on acceptably safe levels of exposures to contaminants in drinking water. The **Acute 10-day** values apply specifically to acute toxic effects on children, but should be protective for adults. The **chronic (lifetime)** values for non-cancer health effects should be protective of health even with a lifetime exposure. In most cases, this value will be the same as the MCLG, if one has been established. The chronic (lifetime) values for cancer are set at a level that should yield no greater than an additional 10^{-6} risk over a lifetime exposure. EPA **cancer weight of evidence** determinations are listed to provide additional information on EPA's judgement of carcinogenicity for each chemical. The weight of evidence classifications are as follows:

A known human carcinogen
B1 probable human carcinogen based on human data
B2 probable human carcinogen based on animal data
C possible human carcinogen based on animal data
D insufficient data to classify chemical
E not a human carcinogen

APPLICABILITY AND USES OF THIS TABLE

The different types of standards and advisories contained in this table are based upon approaches and assumptions that are specific to each and consequently may have varying applications depending on their derivation. Use of specific types of information should be guided by the relevant legal requirements and an understanding of the meaning of the information itself.

MCLs and treatment techniques are the only federally enforceable NPDWRs. They are set to be health protective as well as feasible. More stringent state-specific MCLs are enforceable in the indicated state. MCLGs are not enforceable, but provide health-based guidance for decision making. MCLGs for chemicals causing non-carcinogenic health effects are based on the RfD and set at a level believed to be safe. MCLGs for chemicals believed to be carcinogens are set at zero, from the perspective that no level of carcinogen is safe. Feasibility is not considered in setting MCLGs. Secondary MCLs are not enforceable, but provide information on aesthetics and palatability.

Health advisories and criteria are not formally promulgated in regulations and are subject to change as new data and analyses become available. MCLGs, values in IRIS and health advisories are developed by different offices and on different schedules. Therefore, values for similar effects from a given chemical may not be consistent throughout the table. The derivations of MCLGs and chronic (lifetime) health advisories for non-carcinogenic chemicals are based on the same assumptions regarding endpoints of toxicity. In theory, the MCLG and lifetime health advisory should be the same for a specific contaminant. Slight differences in the table are due to rounding of numbers.

When considering a value to use for determining an acceptable level of contaminant in drinking water, the MCL should be selected first. In the absence of existing or proposed MCLs, users may have to decide which criteria are most appropriate. USEPA recommends a priority ranking to first consider any proposed MCLG (if other than zero), followed by the IRIS RfD or cancer risk level, and finally the chronic health advisory values.

Under the **Superfund Program**, remdial actions must comply with the **Applicable or Relevant and Appropriate Requirements (ARARs)**. For actions involving contamination of drinking water supplies, the ARARs under the Safe Drinking Water Act are the MCLs. Where there are no MCLs, or where the MCLs are determined to be insufficiently protective because of multiple contaminants, reference should be made to Superfund guidance documents to determine clean-up policy. For remedial actions impacting aquatic organisms and waters regulated under the Clean Water Act, consult the National Ambient Water Quality Criteria (NAWQC).

SYMBOLS USED IN THE TABLE

mg/l = milligrams per liter, equivalent to parts per million (**ppm**)
ug/l = micrograms per liter, equivalent to parts per billion (ppb)

Note: values in table are in ug/l unless otherwise stated

IRIS = USEPA Integrated Risk Information System
RfD = Reference dose for daily oral ingestion in micrograms per kilogram body weight per day (ug/kg-d)
10^{-6} = one in a million excess lifetime cancer risk
TT = treatment technique, set in lieu of numeric MCL
+ = value from USEPA Final Draft Health Advisory
td = temperature dependent value
LOQ = Limit of quantification
T&O = taste and odor refers to a value based upon organoleptic data for controlling undersirable taste and odor qualities

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aluminum	Secondry	50-200								1000		
Ammonia							30,000		D			
Antimony	Current	6	6	0.4		15	3		D			
Arsenic	Current	50		0.3	0.02			0.02	A	50		50
Asbestos	Current	7E+6 long fi	7E+6 bers						A			
Barium	Current	2,000	2,000	70			2,000+		D	1,000		1000
Beryllium	Current	4	4	5	.008	30,000		0.008	B2			
Boron				90		900	600		D			
admium	Current	5	5	.5		40+	5+		D	10		10
Chloramine				100		1000	2600		D			
Chlorate									D			
Chloride	Secondry	250ppm										
Chlorine									D			
Chlorine Dioxide				3			80		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorite												
Chromium(Total)	Current	100	100	5		1,000+	100+		D	50		50
Copper	Current Secondry	TT## 1,000	1,300						D			
Cyanide	Current	200	200	22		200+	200+		D			
Fluoride	Current Proposed secondry	4,000 2,000	4,000	120					D	1400- 2400td		
Iron	Secondry	300										
Lead	Current	TT#	0						B2	50		
Manganese	Secondry	50		140								
Mercury (inorganic)	Current	2	2	0.3			2+		D	2		
Molybdenum				5		80	35		D			
Nickel	Current	100	100	20		1,000+	100+		D			
Nitrate (as N)	Current	10ppm	10ppm	1600		10,000+***			D	45ppm as NO3		10ppm (as N)
Nitrite (as N)	Current	1,000	1,000	160		1,000+***			D			
Selenium	Current	50	50	5						10		50

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
- Treatment technique triggered at Action Level of 1300 ppb
td - td- temperature dependent value
- Treatment technique and public notification triggered at Action Level of 15 ppb
*** - 10-day HA for nitrate/nitrite for 4kg child (protective of 10kg child & adults); also used for chronic (lifetime)

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Silver	Secondry	100		5		200	100		D	50		50
Strontium				600		25,000	17,000		D			
Sulfate	Secondry	250 ppm										
Thalium	Current	2	0.5	0.07		7	0.4					
Vanadium				7					D			
Zinc	Secondry	5,000		300		6,000	2,000		D			5,000
Acrylonitrile					0.06	20+		0.06+	B1			10
RADIONUCLIDES												
ross Alpha, excl. ranium & Radon	Current	15pCi/l						.15pCi/l	A	15pCi/l		
Gross Beta	Current	4mrem per yr						0.04mrem per year	A	50pCi/l		
Radium 226	Current Proposed	5 pCi/l (+228) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radium 228	Current Proposed	5 pCi/l (+226) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radon	Proposed	300 pCi/l	0					1.5pCi/l	A			
Strontium 90									A	8pCi/l		

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

RADIONUCLIDES Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Tritium									A	20nCi/l		
Uranium	Proposed	20 ppb	0					0.7 ppb	A	20pCi/l		35pCi/l
ORGANIC												
Acenaphthylene (acenapthene)				60								
Acephate				4					C			
Acetone				100					D			
Acetophenone				100								
Acifluorfen				13	1.0	2,000+		1.0+	B2			
Acrolein									C			320
Acrylamide	Current	TT	0	0.2	.01	30+		0.01+	B2			
Adipates (di(ethylhexyl)-adipate)	Current	400	400	600	0.03	20,000	400	0.03	C			
Alachlor	Current	2	0	10	0.4	100+		0.4+	B2		LOQ (.2)	0.2
Aldicarb	Final(a)	3	1	1.0			7+		D		10	9
Aldicarb Sulfone	Final(a)	2	1	1.0			7+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
a - Effective date postponed

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aldicarb Sulfoxide	Final(a)	4	1	1.0			7+		D			
Aldrin				0.03	.002	0.3		0.002	B2		LOQ (0.05)	
Allyl alcohol				5								
Ametryn				9		9,000+	60+		D			
Ammonium Sulfamate				280		20,000+	2,000+		D			
Anthracene (PAH)				300					D			
Atrazine	Current	3	3	35	0.16	100+	3+		C	3		(HI 3)
Baygon (Propoxur)				4		40+	3+		C		90	
Benefin				300								
Bentazon (Basagran)				2.5		300+	20+		D	18		
Benzene	Current	5	0		1	200+		1.0+	A	1		5
Benzene hexachloride α, β isomers (BHC)											0.7 α 0.3 β	
Benz(a)anthracene (PAH)	Proposed	0.1	0						B2			
Benzo(a)pyrene (PAH)	Current	0.2	0						B2			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Benzo(b)fluoranthene (PAH)	Proposed	0.2	0						B2			
Bolero (thiobencarb)										70		
Bromacil				130		5,000+	90+		C			
Bromochloromethane				13		1,000	90					
Bromodichloro-methane (THM)	Current	100 @		20	0.6	7,000+		0.6	B2			
Bromoform (THM)	Current	100 @		20	4	2,000		4	B2			
Bromomethane (Methyl Bromide)				1		100+	10+		D			2.5
Butyl benzyl-phthlate (PAE)	Proposed	100	0	200					C			
Butylate				50		2,000+	350+		D			
Captafol				2	4				C			
Captan				130					B2		350	
Carbaryl				100		1,000+	700+		D		60	
Carbofuran	Current	40	40	5		50+	40+		E	18		36
Carbon Disulfide				100								830

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Carbon Tetrachloride	Current	5	0	0.7	0.3	200+		0.3+	B2	0.5		5
Carboxin				100		1,000+	700+		D			
Chloral Hydrate				0.2		1,400	60		D			
Chloramben				15		3,000+	100+		D			
Chlordane	Current	2	0	0.06	0.03	60+		0.03+	B2	0.1		
2,4-Dinitrotoluene				2	50	500		50	B2			
Chlorobenzene (Monochlorobenzene)	Current	100	100	20		2,000+	100+		D	30		
Chlorodibromomethane (THM)	Current	100 @		20		7,000	60		C			
hloroform (trichloromethane) (THM)	Current	100 @		10	6	4,000		6.0	B2			
bis-2-Chloroiso-propyl ether				40		4,000+	300+		D			
Chloromethane				4		400	3		C			
2-Chlorophenol				5		50	40		D			
Chloropicrin											50(37 T&O)	
Chlorothalonil				15	1.5	200+		1.5+	B2			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorotoluene(o,p)				20		2,000+	100+		D			
CIPC (Chlorpropham) (isopropylN(3chloro-phenyl) carbamate)				200							350	
Chlorpyrifos				3		30+	20+		D			
Cresol(o,m)				500					C			
Cyanazine				2		100+	1		C			
DDT				0.5	0.1				B2			
Dalapon	Current	200	200	26		3,000+	200+		D			
DCPA (Dacthal)				500		80,000+	4,000+		D			
Di(ethylhexyl)-adipate (Adipates)	Current	400	400	600	0.03	20,000	400+	0.03	C			
Diazinon				0.09		20+	0.6+		E		14	
Dibromochloro-methane (THM)	Current	100 @		20		7,000	60		C			
1,2-Dibromo-3-chloro propane (DBCP)	Current	0.2	0		0.03	50+		0.03	B2	0.2		(HI.04)
Dibutyl phthalate (PAE)				100					D			
Dicamba				30		300+	200+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Dichloroacetic Acid				8		50,000+			B2			
Dichloroacetonitrile				8		1000+	6+		C			
1,2-Dichlorobenzene (o-Dichlorobenzene)	Current Proposed secondry	600 10	600	90		9,000+	600+		D		130 *** (10T&O)	
1,3-Dichlorobenzene (m-Dichlorobenzene)	Current	600	600	90		9,000+	600+		D		130 *** (20T&O)	
1,4-Dichlorobenzene (p-Dichlorobenzene)	Current Proposed secondry	75 5	75	100		10,000+	75+		C	5		750
Dichlorodifluoro-methane (Freon 12)				200		40,000+	1,000+		D			1.0
1,1-Dichloroethane										5		
1,2-Dichloroethane	Current	5	0		0.4	700+		0.4	B2	0.5		5.0
1-Dichloroethylene	Current	7	7	9		1,000+	7+		C	6		7.0
cis-1,2-Dichloro-ethylene	Current	70	70	10		3,000+	70+		D	6		
trans-1,2-Dichloro-ethylene	Current	100	100	20		2,000+	100+		D	10		
Dichloromethane (Methylene chloride)	Current	5	0	60		2,000+		5+	B2		40	
2,4-Dichlorophenol				3		30+	20+		D			
2,4-Dichlorophenoxy -acetic acid (2,4-D)	Current	70	70	10		300+	70+		D	100		100

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
*** - Action Level is for a single isomer or sum isomers

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,2-Dichloropropane	Current	5	0		0.5	90+		0.5+	B2	5		
1,3-Dichloropropene				0.3	0.2	30+		0.2+	B2	0.5		
Dieldrin				0.05	.002	0.5+		0.002+	B2		LOQ-(0.05)	
Diethylphthalate (PAE)				800			5000+		D			
Diisopropylmethyl-phosphonate				80		8,000+	600+		D			
Dimethoate				0.2							140	
Dimethrin				300		10,000+	2,000+		D			
Dimethylaniline				20	0.05				C			
2,4-Dimethylphenol				200							400 (T&O)	
2,6-Dinitrotoluene				1.0	50 (tg)	400		50 (tg)	B2 (TG)			
1,3 Dinitrobenzene				0.1		40	1		D			
Dinoseb	Current	7	7	1		300+	7+		D			
1,4-Dioxane (p-Dioxane)					7	400+		7+	B2			
Dioxin (2,3,7,8-TCDD)	Current	3E-5	0	1E-6	2E-7	1E-4		2E-7+	B2			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
tg - technical grade dinitrotoluene only

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Diphenamid(e)				30		300+	200+		D		40	
Di(ethylhexyl)-phthalate (PAE) (Phthalates)	Current	6	0	20	3			3+	B2	4		
Diquat	Current	20	20	2.2			20+		D			
Disulfoton				0.04		10+	0.3+		E			
Diuron				2		1,000+	10+		D			
Endothall	Current	100	100	20		800+	100+		D			
Endrin	Current	2	2	0.3		20+	2+		D	.2		0.2
Epichlorohydrin	Current	TT	0	2	4	100+		4	B2			
hion				0.5							35	
Ethylbenzene	Current Proposed secondry	700 30	700	100		3,000+	700+		D	680		
Ethylene Dibromide (dibromoethane) (EDB)	Current	0.05	0		4E-4	8		0.0004	B2	0.02		(HI.04)
Ethylene Glycol				2,000		6,000+	7,000+		D			
Ethylene Thiourea (ETU)				0.08	0.3	300+		0.3	B2			
Fenamiphos				0.25		9+	2+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Fluometuron				13		2,000+	90+		D			
Fluorotrichloro-methane				300		7,000+	2,000+		D			
Folpet				100					B2			
Fonofos				2		20+	10+		D			
Formaldehyde				150		5,000+	1,000+		B1		30	
Glycidaldehyde				4					B2			
Glyphosate	Current	700	700	100		20,000+	700+		D	700		
HMX				50		5,000+	400+		D			
Heptachlor	Current	0.4	0	0.5	.008	10+		0.008+	B2	0.01		
Heptachlor epoxide	Current	0.2	0	0.013	.004			0.004	B2	0.01		
Hexachlorobenzene (Perchlorobenzene) (HCB)	Current	1	0	0.8	0.02	50+		0.02+	B2			
Hexachlorobutadiene				2		300+	1+		C			
Hexachlorocyclo-pentadiene (HEX)	Current Proposed secondry	50 8	50	7					D			
n-Hexane						4,000+			D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Hexazinone				33		3,000+	200+		D			
Isophorone				200		15,000+	100+		C			
Lindane (gamma-HCCH) (gamma-BHC)	Current	0.2	0.2	0.3		1,000+	0.2+	0.03	C	4		
Linuron				2					C			
MCPA				1.5		100+	11+		E			
Malathion				20		200+	200+		D		160	
Maleic Hydrazide				500		10,000+	4,000+		D			
Cresol(p)				5					C			
erphos				0.3								
Methomyl (Lannate)				25		300+	200+		D			
Methoxychlor	Current	40	40	5		50	40		D	100		
Methylene Chloride (Dichloromethane)	Current	5	0	60	5	2,000+		5+	B2		40	
Methyl ethyl ketone (MEK,2-Butanone)				600					D			
Methyl Parathion				.25		300+	2+		D		30	

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Methyl t-butyl ether				5		3,000+	40+		D			
Metolachlor				150		2,000+	100+		C			
Metribuzin				25		5,000+	200+		D			
Mirex				0.2	.02				B2			
Molinate				2						20		
Naphthalene				4		500+	20+		D			
Nitroguanidine				100		10,000+	700+		D			
Oxamyl (Vydate)	Current	200	200	25		200+	200+		E			
Paraquat				4.5		100+	30+		E			
Parathion (Ethyl Parathion)				6					C		30	
Pentachloronitro-benzene (Terrachlor)				3	0.1				C		0.9	
Pentachlorophenol	Current	1	0	30	0.3	300+		0.3	B2		30	
Phenol				600		6,000+	4,000+		D		5(T&O) Cl2Syst	
Phthalates (di(ethylhexyl)-phthalate)	Current	6	0	20	3			3+	B2	4		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Picloram	Current	500	500	70		20,000+	500+		D			
Polychlorinated Biphenyls (PCBs)	Current	0.5	0		.005			0.005	B2			
Polynuclear Aromatic Hydrocarbons (PAHs) (benzo(a)pyrene)	Current	0.2	0						B2			
Prometon				15		200+	100+		D			
Pronamide				75		800+	50+		C			
Propachlor				13		500+	90+		D			
Propazine				20		1,000+	10+		C			
Propham				20		5,000+	100+		D			
ɔx				3	0.3	100+	2+	.3	C			
Simazine	Current	4	4	5		70	4+		C	10		
Styrene	Current Proposed secondry	100 10	100	200		2,000+	100+		C			
Tebutiuron				70		3,000+	500+		D			
Terbacil				13		300+	90+		E			
Terbufos				.13		5+	0.9+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Terrachlor (pentachloro-nitrobenzene)				3	0.1				C		0.9	
1,1,1,2-Tetrachloro-ethane				30	1	2,000+	70+	1+	C			
1,1,2,2-Tetrachloro-ethane									C	1		
Tetrachloroethylene (Perchloroethylene)	Current	5	0	10	0.7	2,000+		0.7+	B2	5		
2,3,7,8-Tetrachloro-dibenzo-p-dioxin (Dioxin)	Current	3E-5	0	1E-6	2E-7	1E-4+		2E-7+	B2			
Thiobencarb										70		
Toluene	Current Proposed secondry	1,000 40	1,000	200		2,000+	1,000+		D		100	
Toxaphene	Current	3	0	100	0.03	40+		0.03+	B2	5		5
Tribromomethane (Bromoform)(THM)	Current	100 @		20	4	2,000+		4	B2			
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)										1200		
Trichloroacetic acid				40		2000	1000		C			
1,2,4-Trichloro-benzene	Current	70	70	10		100+	70		D			
1,3,5-Trichloro-benzene				6		600+	40+		D			
1,1,1-Trichloro-ethane	Current	200	200	35		40,000+	200+		D	200		200

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,1,2-Trichloro-ethane	Current	5	3	4		400+	3+		C	32		
Trichloroethylene	Current	5	0		3			3	B2	5		5
Trichlorofluoro-methane (Freon 11)				700						150	150	
2,4,6-Trichloro-phenol					3			3	B2			
2,4,5,-Trichloro-phenoxyacetic acid (2,4,5-T)				10		800+	70+		D			
2,4,5 Trichlorphen-oxypropionic acid (2,4,5-TP) (Silvex)	Current	50	50	7.5		200+	50+		D	10		10
1,2,3-Trichloro-propane				6		600+	40+		B2			(HI .8)
Trifluralin				7.5		80+	5+	5+	C			
ihalomethanes (THM) (See Chloroform)	Current	100 @							B2	100		
Trinitroglycerol						5	5					
Trinitrotoluene				0.5	1	20	2	1	C			
Trithion											7	
Vinyl Chloride	Current	2	0		.015	3,000+		0.015+	A	0.5		
Xylenes- sum of isomers	Current Proposed secondry	10ppm 20	10ppm	2000		40,000+	10,000+		D	1750		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
TT - Treatment technique in lieu of numeric MCL

MICROB.-TURBIDITY Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
MICROB.-TURBIDITY												
Giardia Lamblia	Current	TT	0									
Heterotrophic Plate Count	Current	TT β	NA									
Legionella	Current	TT β	0									
Total Coliforms	Current	P/A ∞	0									
Turbidity	Current	1/5 NTU	NA									
Viruses	Current	TT β	0									
WATER QLTY.SECONDARY MAX.CONT.LEV												
Color	Secondry	15color units										
Corrosivity	Secondry	Noncor-rosive										
Foaming Agents	Secondry	500										
Odor (Odor threshold)	Secondry	3.0 OT#										
Total Dissolved Solids (TDS)	Secondry	500 ppm										
pH	Secondry	6.5-8.5										

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
β - Surface waters and groundwater under the direct influence of surface water only.
∞ - P/A - MCL is based on the presence/absence of total coliforms
∂ - 1 NTU Monthly average, 5 NTU two-day consecutive average
- Odor Threshold Numbers

TABLE 2

PRIORITY LIST OF CONTAMINANTS WHICH MAY REQUIRE REGULATION UNDER THE SDWA (1991 VERSION)

Microorganisms

Cryptosporidium

Inorganics

Aluminum
Boron
Chloramines
Chlorate
Chlorine
Chlorine dioxide
Chlorite
Cyanogen chloride
Hypochlorite ion
Manganese
Molybdenum
Strontium
Vanadium
Zinc

Pesticides

Asulan
Bentazon
Bromacil
Cyanazine
Cyromazine
DCPA (and acid metabolites)
Dicamba
Ethylenethiourea
Fomesafen
Latofen/Acifluorfen
Metalaxyl
Methomyl
Metolachlor
Metribuzin
Parathion degradation product (4-nitrophenol)
Prometon
2,4,5-T
Thiodicarb
Trifluralin

Synthetic Organic Chemicals

Acrylonitrile
Bromobenzene
Bromochloroacetonitrile
Bromodichloromethane
Bromoform
Bromomethane
Chloroethane
Chloroform
Chloromethane
Chloropicrin
o-Chlorotoluene
p-Chlorotoluene
Dibromoacetonitrile
Dibromochloromethane
Dibromomethane
Dichloroacetonitrile
1,3-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
2,2-Dichloropropane
1,3-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
2,4-Dinitrophenol

Synthetic Organic Chemicals (con't)

2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluorotrichloromethane
Hexachlorodutadiene
Hexachloroethane
Isophorone
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl t-butyl ether
Naphthalene
Nitrobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrahydrofuran
Trichloroacetonitrile
1,2,3-Trichloropropane

Chlorination/ chloramination byproducts (misc.): haloacetic acids, haloketones, chloral hydrate, 3-chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX-2), N-organochloramines

Ozonation byproducts: aldehydes, epoxides, peroxides, nitrosamines, bromate, iodate

APPENDIX

DESCRIPTION OF STANDARDS AND ADVISORIES

Authority

Under the authority of the Safe Drinking Water Act (SDWA, Public Law 93-523), the USEPA is mandated to establish National Primary Drinking Water Regulations for contaminants occurring in drinking water. Primary NPDWRs are established and enforced to protect the public from adverse health effects resulting from a drinking water contaminant. Included in these regulations are the drinking water standards which set either 1) treatment techniques to control a contaminant, or 2) the Maximum Contaminant Level (MCL) allowable for the contaminant in drinking water. An MCL is set when an appropriate method of detection for the contaminant exists. A treatment technique approach is used when it is not possible to quantify the contaminant at the level necessary to protect public health. Secondary standards are established based on non-health related aesthetic qualities of appearance, taste and odor. These secondary standards are not federally enforceable.

States may choose to accept responsibility (Primacy Status) for the oversight and enforcement of US drinking water regulations. States which have primacy status from USEPA must adopt State drinking water standards that are at least as stringent as federal standards. A state may choose to enforce secondary standards as well as primary standards.

USEPA Maximum Contaminant Level Goals (MCLGs)

MCLGs are developed by the Office of Science and Technology in the USEPA Office of Water as a required first step toward promulgation of NPDWRs. MCLGs are non-enforceable health goals which are to be set at levels at which no known or anticipated adverse effects on the health of persons occur, and which allow for an adequate margin of safety. Prior to the SDWA Amendments of 1986, these levels were called Recommended Maximum Contaminant Levels (RMCLs). MCLGs are strictly health-based levels and are derived from relevant toxicological data.

For chemicals that produce adverse health effects and are not believed to be carcinogenic (non-carcinogens), the MCLG is based on the Reference Dose (RfD). A RfD is calculated from toxicological data to represent a contaminant level that should be without risk of adverse health effects even with a lifetime exposure. USEPA assumes that a threshold exists for non-cancer health effects from chemical contaminants, below which the effect will not occur. Thus the MCLG will be a non-zero number. The RfD, which is based on the

total daily amount of contaminant taken up by a person on a body weight basis, is converted to a Drinking Water Equivalent Level (DWEL) concentration and adjusted for the percentage contribution of other sources (relative source contribution, RSC) of the contaminant besides drinking water (air, food, etc) to arrive at the MCLG. This calculation assumes a lifetime consumption of 2 liters of drinking water per day by a 70 kg adult. Unless otherwise noted, the RSC from drinking water for organic and inorganic compounds is respectively 20% and 10%.

USEPA assumes that no threshold exists for cancer and thus, there is no absolutely safe level of contamination. For chemicals that are known (Group A) or probable (Group B) human carcinogens, USEPA policy directs that the MCLG be set at zero, in accordance with a recommendation by the US Congress. For contaminants believed to be possible human carcinogens (Group C), the MCLG may be derived based on relevant non-cancer health effects as described above. In this case, the RfD is divided by an additional uncertainty factor of 10. In some cases, Group C chemicals will have MCLGs set based on calculated maximum lifetime cancer risks of between 1/10,000 and 1/million.

Maximum Contaminant Levels (MCLs)

MCLs are federally enforceable limits for contaminants in drinking water established as NPDWRs. The MCL for a given contaminant is set as close to the corresponding MCLG as is feasible. "Feasible" is defined in the 1986 SDWA Amendments as "feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)." To promulgate a MCL for a contaminant requires that a method of detection for that contaminant is available suitable for the level desired and a Best Available Technology is identified that can feasibly remove the contaminant to the desired level.

Secondary Maximum Contaminant Levels

Secondary MCLs are established under the SDWA to protect the public welfare. Such regulations apply to contaminants in drinking water that adversely affect its odor, taste or appearance and consequently cause a substantial number of persons to discontinue its use. Secondary MCLs are not based on direct adverse health effects associated with the contaminant, although some contaminants may have both a MCL and a SMCL. SMCLs are considered as desirable goals and are not fereally enforceable. However, states may choose to promulgate and enforce SMCLs at the state level.

Health Advisories

Health Advisories (HAs) for drinking water contaminants are levels considered to be without appreciable health risk for specific durations of exposure. HAs should be considered guidance and are not enforceable drinking water standards. HAs were previously know as Suggested No Adverse Response Levels (SNARLs).

USEPA HAs are developed and published initially as External Review Drafts, and then as a Final Draft. This designation indicates that the HA will be always subject to change as additional information becomes available. HAs are developed for one-day, 10-day, longer-term (approximately 7 years) and lifetime (70 year) exposures based on data describing non-carcinogenic health effects resulting from the contaminant. One-day and 10-day HAs use parameters which reflect exposures and effects for a 10 kg child consuming 1 liter of water per day. Lifetime HAs consider a 70 kg adult consuming 2 liters of water per day. Longer-term HAs can incorporate either child or adult parameters. A relative source contribution from water is also factored into the lifetime HA calculation to account for exposures from other sources (air, food, soil, etc) of the contaminant.

For known or probably human carcinogens, the lifetime HA level is based on an upper-bound excess lifetime cancer risk of 1/million. This means that **USEPA considers that the risk from a lifetime consumption of water at the given level is unlikely to be greater than 1/million, is most likely substantially less and may be zero.**

Reference Dose (RfD) and Drinking Water Equivalent Level (DWEL)

The RfD is a daily exposure level which is believed to be without appreciable health risk to humans over a lifetime. The RfD is usually derived from an experimental "no observed adverse effect level" (NOAEL), identified as the highest dose in the most relevant study that did not result in a known adverse effect. The NOAEL is divided by various uncertainty factors to derive the RfD. These uncertainty factors account for the variation in human response, extrapolation to human responses if animal experiments were used, data quality and relevance. The RfD takes the form of dose ingested per unit body weight per day (ug/kg-d).

The DWEL is the conversion of the RfD into an equivalen water concentration. It assumes that a 70 kg adult consumes two liters of water per day and that the total dose to a person results solely from drinking water. It is important to remember that actual exposures in the environment may occur through other routes, such as inhalation or dermal contact, or from other sources, such as from food or soil.

California Action Levels

California Department of Health Services Action Levels are health-based criteria derived much in the same way as EPA Health Advisories. Specific approaches to determining cancer risks and exposure assumptions may differ in some ways from those used by USEPA. California Action Levels are not enforceable drinking water standards, but are levels at which CA DOHS strongly urges water purveyors to take corrective action to reduce the level of contamination in the water they supply. Action Levels cease to exist when CA State MCLS are promulgated.

Integrated Risk Information System (IRIS)

IRIS is an EPA catalogue of Agency risk assessment and risk management information for chemical substances. It is available electronically in several formats. The risk assessment information contained in IRIS, unless specifically noted, has been reviewed and agreed upon by intra-agency work groups and represents Agency consensus. Chemical contaminants listed in IRIS may have descriptions of relevant toxicological experiments and risk assessment approaches used in the determination of RfDs, cancer risks and health advisories. Extensive bibliographies are included. Regulations and regulatory status for different media may be presented.

REFERENCES

EPA MCLs: Code of Federal Regulations, Title 40, Part 141.

EPA Final Rule and Proposed Rule, Fluoride: Federal Register Vol. 50, No. 220, November 14, 1985.

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EPA Final Rule, Fluoride National Primary and Secondary Drinking Water Regulations: Federal Register Vol. 51, No. 63, April 2, 1986.

EPA Final Rule, Volatile Organic Chemicals Drinking Water Regulations: Federal Register Vol. 52, No. 130, July 8, 1987.

EPA Proposed Rule, National Primary and Secondary Drinking Water Regulations; Synthetic Organic Chemicals and Inorganc Chemicals Federal Register, Vol. 55, No. 143, July 25, 1990.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 20, January 30, 1991.

EPA Final Rule, Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Federal Register, Vol. 56, No. 110, June 7, 1991.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 126, July 1, 1991.

NAS Health Advisories: Drinking Water and Health, National Academy Press, Volumes 1 (1977), 3 (1980), 4 (1982), 5 (1983), 6 (1986), and 7 (1988).

EPA Health Advisories: are from the EPA Office of Drinking Water. These are published and are available from the National Technical Information Service (NTIS).

IRIS, Integrated Risk Information System, EPA, Office of Health and Environmental Assessment, Office of Research and Development, Washington, D.C. 20460.

Arizona Department of Health Services, Office of Risk Assessment and Investigation, 3008 N. 3rd Street, Phoenix, Arizona 85012.

California Department of Health Services, Office of Drinking Water, 2151 Berkeley Way, Berkeley, CA 94704.

APPENDIX B

TABLE B-1
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
T2S/3W 31N1	1955 - 1983			21	4	metals, organics
31R1	1957 - 1963			12		
_36E1	1949			1		
T2S/4W 36R1	1956 - 1960			2		
T3S/2W 7R	1985 - 1993	1	1	1		
7P1	1953 - 1967			29		
_8E1	1973			1		
18R1	1963 - 1973			3		
18R2	1973 - 1992			2		
21A1	1969			1		
21A2	1973			1		
21B1	1963			1		
21C1	1949			1		
26L1	1973			1		
26M1	1963 - 1973			3		
27G1	1963 - 1993	1	1	4		
28L	1992	1	1			
28Q1	1975 - 1992	1	1	2		
29R1	1952			1		
30C1	1963			1		
32C1	1967			1		
32G1	1959 - 1964			2		
32R1	1963 - 1965			2		
33A	1967			1		
34E	1992	1	1			
34M	1967			2		
34Q	1967			1		
34Q1	1967			1		
35M	1967 - 1992			2		
35M1	1965 - 1967			2		
35Q2	1973			2		
32E	1985			1		
32D1	1985			1		
T3S/3W 2H1						
2L1	1973			1		
2L2	1973 - 1991	2	2	2	2	metals, pesticides
6D	1970 - 1985			6		
6D2	1991			2	2	metals
6M1	1967 - 1970			2		
6N3	1967 - 1983			6	1	metals
7F1	1968			1		
7Q1	1977	1				
12K1	1973 - 1991	1		10		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis: TDS	NO3	Gen Min	Other	Other Type
18A1	1977			1		
20A	1958 - 1960			2		
20G2	1977	1				
21A1	1977	1				
21A2	1965 - 1977			3		
21C	1958			1		
21C1	1950 - 1977	1		5		
22D1	1960 - 1976			9		
22D	1977	1				
_29E1	1958 - 1978	1		21		
29M1	1953 - 1983			24		
30H1	1977	1		1		
30J1	1977	1		1		
30Q1	1977	1		1		
31B1	1993	1	1			
32M1	1958 - 1959			1		
T3S/4W1J1	1974 - 1982			5		
4W10	1981 - 1983			3		
4W10	1981 - 1983				3	metals
24C1	1976 - 1982			2		
24D1	1976 - 1983			3		
24D2	1976 - 1983			3	1	pesticides
T4S/2W 2C	1953 - 1973			6		
2D1	1963 - 1967			2		
2D2	1965			1		
2K1	1973			1		
2N2	1949			1		
3P	1967			1		
7J	1991	1	1			
7P	1992	1	1			
7Q	1991	1	1			
8B	1991	1	1			
_8E1	1967			1		
8G	1993	1	1			
8Q	1967			1		
8R	1967 1993		1	1		
8K	1993		1			
8Q	1993		1			
9M1	1973 - 1979			8		
10A	1993	1	1			
10A1	1975 - 1993	1	1	1		
10B1	1975			1		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
10C1	1963 - 1967			2		
10E	1964 - 1993		1	2		
11B1	1964 - 1974			10		
11B2	1972 - 1974			4		
11C1	1963 - 1979			19		
11C2	1993	1	1			
11D1		1	1			
_11E1	1964			1		
_11E2	1963 - 1967			3		
11F	1964			1		
11F1	1972			1		
12N	1967			1		
12N1	1958			1		
17D2	1965 1976			10		
18A1	1965 1989		1	18		
18B1	1965 1989			13		
18D	1990	1	1			
18D1	1977	1				
18G1	1987		1			
18G3	1939 1979			13		
24H1	1957 1984		1	13	2	metals
24J1	1972 1973			2		
27H2	1974 1979			9		
_36E1	1993	1	1			
36J1	1954 1958			7		
36J2	1963			1		
36M	1985			1		
36N	1983 1991				2	bacteriological
T4S/3W 6A3	1975 - 1981	1		3		
6C	1991			3	1	organics
6C1	1994	1	1			
6C2	1975 - 1977	1		2		
6F1	1977	1		1		
6H1	1970 - 1979			6	2	pesticides
6H2	1973 - 1983			5		
6Q1	1954 - 1993	2	1	32	1	organics
6Q2	1986				2	organics
6Q3	1967 - 1988			15	5	organics,metals radiological
7G2	1953 - 1977	1		1		
7H1	1977	1		1		
7J1	1955 - 1977	1		28		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis: TDS	NO3	Gen Min	Other	Other Type
7J2	1993	1	1			
_8E1	1969 - 1977	1		2		
8N1	1963			1		
9N2	1966			1		
9N3	1966 - 1977	1		4		
9P	1993	1	1			
10E	1981			2		
_10E1	1980 - 1983			2		
_10E3	1967			1		
13Q1	1955 - 1969			25		
16B				1		
16C	1985 - 1993			1	1	organics & metals
16N1	1958 - 1977	1		22		
17A1	1959 - 1968			18		
17C1	1954 - 1965			24		
17J1	1956 - 1978			11		
17J3	1977	1		1		
18	1970			1		
18J	1972			1		
18J2	1975 - 1988			7	4	organics & metals
19A1	1953 - 1993	2	1	3		
19A3	1977	1				
20P1	1954			1		
21F	1956 - 1976	1		28		
21D	1958 -			1		
24B	1990		1			
24B1	1963 - 1977	1		1		
24N	1969			1		
24P1	1943 - 1976			29		
25D2	1965 - 1977	1		3		
26J1	1958 - 1973			4		
26K	1989 - 1991	3	5	3		
28C1	1954					
28H1	1965 - 1968			13		
29C3	1977			2		
29G2	1970 - 1977	1		5		
29K1	1963 1977	1		2		
29Q	1969			1		
29Q1	1959 1969			2		
32B	1965			1		
4S/4W 1A1	1993	1	1			
4S/4W 1G1	1993	2	1			
T5S/1W 30D	1992			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
30D2	1977			1		
_30E2	1992			1		
30M1	1957 - 1960			8		
T5S/2W 7E	1990		1			
14R	1980 - 1981			2		
15A1	1958 - 1960			6		
_15E1	1953 - 1956			4		
15F1	1963			1		
15G1	1982 - 1985			2		
15H	1982	1	1			
16F	1982			1		
16F1	1993	1	1			
16G	1983			1		
17B	1982 - 1985	2	2	2		
17B	1982			1		
17B1	1969 - 1978			18		
17C	1982			1		
17C1	1953 - 1967			27		
17F	1982 - 1985			2		
19N1	1953 - 1979			49		
21M2	1993	1				
2.20E+03	1993	1				
23J	1972			1		
23P1	1989				4	bacteriological
23P1	1989		2			
23Q	1986			1		
23R	1989				3	bacteriological
23R	1986			1		
23R1	1973			1		
24B	1981			1		
24B1	1993	1	1			
25C	1979			1		
25C1	1965 - 1977			3		
_25E1	1959 - 1963			2		
25J	1991	1	1			
26B	1987			1		
26G1	1968			1		
26G2	1957			1		
26H2	1963			1		
26H3	1964			1		
26L1	1963			2		
27N1	1988		1	1	1	bacteriological
30D	1991			1	1	radiological
30J1	1975			1		
31N1	1975			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis: TDS	NO3	Gen Min	Other	Other Type
31R	1987			1		
31R	1987				1	metals
33E	1981	1				
35A	1991			1		
35A1	1993	1				
35B1	1969 - 1993	1		1		
35D2	1993	1	1			
36D	1991			3		
36D4	1993		1			
T5S/3W 2Q1	1993	1	1			
3Q2	1975			1		
3R1	1963 - 1968			3		
3R1	1977	1				
3R2	1977	1				
7B1	1975			1		
10H1	1975			1		
11M1	1953			1		
11M2	1955 - 1981			23		
13A	1977 - 1981			2		
13A1	1993	1	1			
13H1	1993	1	1			
14P1	1985			1		
14P1	1977	1				
14P1	1975			1		
15H1	1993	1	1			
16D1	1993	1	1			
16F1	1993	1	1			
16P1	1955 - 1958			6		
16P2	1977 - 1981			2		
17R1	1991			1		
21C1	1975			1		
21C1	1977	1				
21D1	1962 - 1971			17		
21D2	1960 - 1975			16		
21D2	1977	1				
21K	1993	1	1			
24C1	1993	1	1			
27L1	1975			1		
28M1	1993	1	1			
28M2	1993	1	1			
28M3	1993	1	1			
28M4	1993	1	1			
29H1	1955 - 1959			8		
29Q1	1958			1		
32G	1976			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis: TDS	NO3	Gen Min	Other	Other Type
33R2	1991			1		
33R2	1991				1	organics
35N	1992			1		
35P1	1956 - 1968			4		
35Q	1977 - 1993	2	1			
36D1	1963 - 1968			4		
36K1	1962 - 1963			2		
36N	1977	1				
36N1	1991			1		
36P	1992			5		
36P1	1953 - 1956			3		
36Q1	1958 - 1965			11		
T6S/2W 1A2	1976			1		
2G1	1963			1		
2N1	1963			1		
3R2	1962 - 1970			5		
4R1	1988			1		
4R2	1988		1			
7A	1988		1			
7A1	1993	1	1			
7N	1975			1		
7R2	1993	1	1			
T6S/3W 1	1991			4		
1D1	1965			1		
1D2	1975			1		
_1E1	1977	1				
1J1	1975			1		
1J2	1993	1	1			
2A	1993	1	1			
2F1	1963 - 1968			4		
2C1	1975			1		
2D	1993	1	1			
2E	1993	1	1			
2G	1991	2	2	5	2	organics
2H	1991	1	1	2	2	organics
3C	1967			1		
3C1	1975 - 1991			3		
3C2	1975			1		
3H2	1977 - 1991	1		1		
3L1	1993	1	1			
3L2	1993	1	1			
4K1	1953 - 1963			2		
9B1	1975			1		
Totals		106	79	1015	48	

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

	Statistics			
	Total	Average	Maximum	Minimum
Length of Record (years)		5.18	40	1
Number of Samples per Well		4.14	49	1
Samples per Year		1	11	0
Year of Last Sample		1979	1994	1949
Total Number of Wells with Data	301			
Fraction of Wells with Only One Sample	63%			

Appendix C – California Urban Water Conservation Council – Best Management Practices Reports for 2002/2003 and 2003/2004

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Retail**

Year: **2003**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	65763	Imported
EMWD	18200	Groundwater
EMWD	21600	Recycled

Total AF: 105563

Reported as of 9/29/05

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
Eastern Municipal Water District - Retail	**01/27/2005**	**2003**

A. Service Area Population Information:

1. Total service area population 526691

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	91587	47622	0	0
2. Multi-Family	1035	4727	0	0
3. Commercial	1934	6073	0	0
4. Industrial	115	394	0	0
5. Institutional	631	6206	0	0
6. Dedicated Irrigation	791	6145	0	0
7. Recycled Water	82	16296	0	0
8. Other	337	3943	0	0
9. Unaccounted	NA	0	NA	0
Total	96512	91406	0	0
	Metered		**Unmetered**	

Reported as of 9/29/05

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Based on your signed MOU date, 02/07/1992, your Agency STRATEGY DUE DATE is:	02/06/1994
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/01/1997
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	142	0
2. Number of surveys completed:	142	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)	Odometer Wheel	
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		database
b. Describe how your agency tracks this information.		

Input to customer accounts & database and quarterly reports to MWD

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	10650	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   EMWD Ordinance No. 72.19, which is updated regularly & recognized as lawful by local municipalities.

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 68%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 72%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 07/01/1994

   b. Describe your targeting/ marketing strategy.

   Beginning in July 1997, identified & contacted top 20% of water users -- offer survey & conduct those requesting accordingly. In addition, conduct numerous surveys each year beyond those targeted.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	42	100
3. Number of toilet-displacement devices distributed:	114	50
4. Number of toilet flappers distributed:	31	25
5. Number of faucet aerators distributed:	15	8

6. Does your agency track the distribution and cost of low-flow devices? yes

   a. If YES, in what format are low-flow devices tracked? Database

   b. If yes, describe your tracking and distribution system :

   Regular posting to customer accounts, database and quarterly project reports to MWD

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	5500	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	93448
b. Determine other system verifiable uses (AF)	100
c. Determine total supply into the system (AF)	97074
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.96
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1528
2. Number of miles of distribution system line surveyed.	1528

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?

   b. Describe the program:

   All accounts - without exception - are metered. Therefore, no retrofitting program or funding for same is necessary.

3. Number of previously unmetered accounts fitted with meters during report year. 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? yes

   a. If YES, when was the feasibility study conducted? (mm/dd/yy) 07/01/1997

   b. Describe the feasibility study:

   Discussions between Conservation, Customer Service & Information Systems revealed that not enough landscape accounts have mixed-use meters to make any changes/incentives possible.

2. Number of CII accounts with mixed-use meters. 2680

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

All CII landscape accounts with 3,000 sq. ft. or more have been put on water budgets since 1992

Reported as of 9/29/05

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	621
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	385
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	3446
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	2263
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	01/01/1997

b. Description of marketing / targeting strategy:

Monthy contacts -- some written, some oral/in person - every month. PDA classes & moisture sensor installations have also been implemented. Monthly water budget statements sent out and yearly non-compliance settlements charges have been implemented. Also, contracted w/San Jacinto/Hemet Resouce Conservation District to provide Landscape Audits for all non-compliance fee payers.

2. Number of Surveys Offered.	100
3. Number of Surveys Completed.	10

4. Indicate which of the following Landscape Elements are part of your survey:

a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Monthly Water Budget Reports to all accounts with Landscape Meters/Plan Checks. Contract with San Jacinto/Hemet Resource Conservation District to perform audits on all accts who have paid a non-compliance settlement fee for going over their water allocated budget.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey	no

program.
Does your agency provide mixed-use accounts with landscape budgets?

2. Number of CII mixed-use accounts with landscape budgets.	0
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Review of Plan Checks, Assignment of Water Budget, Orientation of Landscape/Irrigation Ordinance 72.19, and follow-up. Monthly water consumption statement.

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	yes
7. Do you provide customer notices at the start of the irrigation season?	yes
8. Do you provide customer notices at the end of the irrigation season?	yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	37000	38000
2. Actual Expenditures	56119	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

No. A1 - relates to all dedicated landscape metered accounts in our sytem. No. A2 - relates to all dedicated landscape metered accts in our system that are active & have a full 12 months usage history. Also, note that No. A1 is less than previous reports due to accts converting to recycled water and/or being designated as under the 3,000 sq ft requirement. EMWD does charge "disincentive fees" from $100 - $500 dollars for going over water budgets by percentages on a 5 step/tiered scale.

Reported as of 9/29/05

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   Socal Edison & the Gas Company at various times offered rebates of $75 to $125 per HEW, until all funds were expended. June 2002 - Nov 2002, MWD offered a $100 rebate for customers within MWD/EMWD zip codes. Eastern provided an additional $10 for a total rebate of $110. Dec 2002 - June 2003, MWD offered a rebate of $110. Eastern provided staff, marketing and costs associated with administering this program - no rebate dollars.

2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate? 0
4. Number of rebates awarded. 313

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	7000	7000
2. Actual Expenditures	6920	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	10
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	15
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	6
g. Speaker's Bureau	yes	8
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	25000	40000
2. Actual Expenditures	24500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	42	30928	0
Grades 4th-6th	yes	38	17156	0
Grades 7th-8th	yes	3	960	0
High School	yes	10	12969	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	117404	166320
2. Actual Expenditures	156184	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "number of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs used to reach students include educational tours of EMWD facilities, a water conservation theater program (assembly style presentations), free water education materials, a "water-wise" poster contest and classroom presentations. The numbers listed reflect the total students reached through all of these programs. EMWD has seen growth in its area, which has resulted in expanding programs to reach more students. As growth continues, EMWD will continue to see the #'s increase.

Reported as of 9/29/05

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	2	0	0
b. Number of New Surveys Completed	2	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	2	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	yes	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	25790	279	25790
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	170
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	60.09

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	5000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
   - Potential savings
   - CII Sector or subsector

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   Special marketing material from Management Company (HDMC), contracted through Metropolitan Water District of Southern California (MWD), provided the tools to do individualized target mailings.

2. How does your agency advertise this program? Check all that apply.
   - Direct letter
   - Bill message
   - Newsletter
   - Web page
   - Trade publications
   - Other print media
   - Trade shows and events
   - Telemarketing

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   Direct mailing of marketing clip sheets. Also, advertising in customer newsletters and Chamber presentations.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes
3. What is the total number of customer accounts participating in the program during the last year ? — 1

CII Subsector	Number of Toilets Replaced			
4.	**Standard Gravity Tank**	**Air Assisted**	**Valve Floor Mount**	**Valve Wall Mount**
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	72	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0

f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	4
b. Inadequate payback	4
c. Inadequate ULFT performance	2
d. Lack of funding	5
e. American's with Disabilities Act	1
f. Permitting	1
g. Other. Please describe in B. 9.	0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Eastern has very limited CII Industry - a lot of new construction with low-flow toilets already installed

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

Participation level this fiscal year doubled from the past year - Hopefully, we will continue to escalate customer participation

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	1500	1500
b. Materials	150	150
c. Marketing & Advertising	350	350
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	2000	2000

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	4320
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	4320

D. Comments

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$32717616
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$7975087
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$3912530
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$253835
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$3999504
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$2206056
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
6. Other	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$1373121

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$36703

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Does your Agency have a conservation coordinator?	no
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	%
b. Coordinator's Name	
c. Coordinator's Title	
d. Coordinator's Experience and Number of Years	
e. Date Coordinator's position was created (mm/dd/yyyy)	12/1/1991
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	232359	160000
2. Actual Expenditures	152854	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Full time Conservation Coordinator, Ted Haring, retired in September 2002. Position not filled - by type - in 2003. However, Conservation Program Representatives and Department Director temporarily took over a portion of Coordinator's assignments. Additional conservation staff was hired in 2004

Reported as of 9/29/05

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Ordinance No. 72.19 provides special provisions for water conservation measures for golf courses & large landscape projects. In addition, several provisions for conservation ethics are included for all EMWD customers.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Moreno Valley, Hemet, Temecula, Murrieta, Perris & San Jacinto	All cities defer to EMWD's Ordinance No. 72.19

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	yes
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name Irrigation during hot/daylight hours. Water between midnight & 6:00 a.m.	yes

2. Describe measures that prohibit water uses listed above:

The Ordinance, requirements for new business connections (on file with CUWCC) and basic conservation messages/bill stuffers that are ongoing.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	yes
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site	

regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	yes
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	yes

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	4000	4000
2. Actual Expenditures	4000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Even though current law does not allow EMWD to prohibit residential on-site regeneration water softeners, our agency discourages this use when queried by customers. Also, Eastern's load limits into the sewer system for commercial water softeners takes care of itself.

Reported as of 9/29/05

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	906	70
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**906**	**70**

6. Describe your agency's ULFT program for single-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

7. Describe your agency's ULFT program for multi-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

N/A	N/A

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	35000	35000
2. Actual Expenditures	34240	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Wholesale**

Year: **2003**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	65763	Imported
EMWD	18200	Groundwater
EMWD	21600	Recycled

Total AF: 105563

Purchaser Information

Name of Agency	Quantity (AF) Supplied	Retailer or Wholesaler
Lake Hemet MWD	1295	retail
City of Perris	2038	retail
DWR	27	wholesale
City of San Jacinto	36	retail
Western MWD	658	wholesale
Nuevo Water Company	530	retail
Murrieta County Water District	52	retail
City of Hemet	717	retail

Total AF: 5353

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	93448
b. Determine other system verifiable uses (AF)	100
c. Determine total supply into the system (AF)	97074
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.96
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1528
2. Number of miles of distribution system line surveyed.	1528

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2003**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	10
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	15
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	6
g. Speaker's Bureau	yes	8
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	25000	40000
2. Actual Expenditures	24500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	42	30928	0
Grades 4th-6th	yes	38	17156	0
Grades 7th-8th	yes	3	3	0
High School	yes	10	10	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	117404	166320
2. Actual Expenditures	156184	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "number of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs include educational tours of EMWD facilities, a water conservation theater program (assembly style presentations), free water education materials, a "water-wise" poster contest and classroom presentations. The numbers listed reflect the total students reached through all of these programs. EMWD has seen growth in the area whigh has resulted in expanding programs to reach more students. As growth continues, the numbers will increase.

Reported as of 9/29/05

BMP 10: Wholesale Agency Assistance Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Financial Support by BMP

BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded	BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded
1	No	0	0	**8**	No	0	0
2	No	0	0	**9**	No	0	0
3	No	0	0	**10**	No	0	0
4	No	0	0	**11**	No	0	0
5	No	0	0	**12**	No	0	0
6	yes	0	0	**13**	No	0	0
7	No	0	0	**14**	yes	0	0

2. Technical Support

a. Has your agency conducted or funded workshops addressing CUWCC procedures for calculating program savings, costs and cost-effectiveness?	No
b. Has your agency conducted or funded workshops addressing retail agencies' BMP implementation reporting requirements?	No
c. Has your agency conducted or funded workshops addressing:	
1) ULFT replacement	No
2) Residential retrofits	No
3) Commercial, industrial, and institutional surveys	No
4) Residential and large turf irrigation	No
5) Conservation-related rates and pricing	No

3. Staff Resources by BMP

Qualified	No. FTE	Qualified	No. FTE

BMP	Staff Available for BMP?	Staff Assigned to BMP	BMP	Staff Available for BMP?	Staff Assigned to BMP
1	No		**8**	No	
2	No		**9**	No	
3	No		**10**	No	
4	No		**11**	No	
5	No		**12**	No	
6	No		**13**	No	
7	No		**14**	No	

4. Regional Programs by BMP

BMP	Implementation/ Management Program?	BMP	Implementation/ Management Program?
1	No	**8**	No
2	No	**9**	No
3	No	**10**	No
4	No	**11**	No
5	No	**12**	No
6	yes	**13**	No
7	No	**14**	yes

B. Wholesale Agency Assistance Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

EMWD encourages its few sub-agencies to participate in rebate programs. Presently, only one (Lake Hemet MWD) is getting MWD/EMWD pass thru funds for ULFTs and washers. However, it is our understanding that since MWD accounts for these funds, EMWD has to indicate a "No" on these items.

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2003**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

2. Commercial

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

3. Industrial

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

4. Institutional / Government

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

5. Irrigation

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

6. Other

a. Water Rate Structure Uniform

b. Sewer Rate Structure Uniform

c. Total Revenue from Volumetric Rates $9492488

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2003**

A. Implementation

1. Does your Agency have a conservation coordinator?	no
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	%
b. Coordinator's Name	
c. Coordinator's Title	
d. Coordinator's Experience and Number of Years	
e. Date Coordinator's position was created (mm/dd/yyyy)	12/1/1991
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	232359	160000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Full time Conservation Coordinator, Ted Haring, retired in September 2002. Position not filled - by type - in 2003. However, Conservation Program Representatives and Department Director temporarily took over a portion of Coordinator's assignments. Additional conservation staff was hired in 2004.

Reported as of 9/29/05

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Retail**

Year: **2004**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	75868	Imported
EMWD	17685	Groundwater
EMWD	25094	Recycled

Total AF: 118647

Reported as of 9/29/05

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
Eastern Municipal Water District - Retail	**01/27/2005**	**2004**

A. Service Area Population Information:

1. Total service area population 550000

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	99871	54616	0	0
2. Multi-Family	1046	5014	0	0
3. Commercial	2146	8033	0	0
4. Industrial	115	411	0	0
5. Institutional	661	6879	0	0
6. Dedicated Irrigation	945	8566	0	0
7. Recycled Water	82	16545	0	0
8. Other	275	3598	0	0
9. Unaccounted	NA	0	NA	0
Total	105141	103662	0	0
	Metered		**Unmetered**	

Reported as of 9/29/05

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Based on your signed MOU date, 02/07/1992, your Agency STRATEGY DUE DATE is:	02/06/1994
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/01/1997
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	94	0
2. Number of surveys completed:	94	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)	Odometer Wheel	
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		database
b. Describe how your agency tracks this information.		

Input to customer accounts, database and quarterly reports to MWD

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	7050	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   EMWD Ordinance No. 72.19, which is updated regularly & recognized as lawful by local municipalities

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no

3. Estimated percent of single-family households with low-flow showerheads: 75%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no

5. Estimated percent of multi-family households with low-flow showerheads: 80%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 07/01/1994

   b. Describe your targeting/ marketing strategy.

   Beginning in July 1997, identified & contacted top 20% of water users -- offer survey & conduct those requesting accordingly. In addition, conduct numerous surveys each year beyond those targeted.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	31	108
3. Number of toilet-displacement devices distributed:	53	50
4. Number of toilet flappers distributed:	10	10
5. Number of faucet aerators distributed:	16	8

6. Does your agency track the distribution and cost of low-flow devices? yes

   a. If YES, in what format are low-flow devices tracked? Database

   b. If yes, describe your tracking and distribution system :

   Regular posting to customer accounts, database and quarterly project reports to MWD

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	760	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Most of the devices that were distributed this year were previously paid for, except the aerators.

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	103045
b. Determine other system verifiable uses (AF)	336
c. Determine total supply into the system (AF)	106455
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1867
2. Number of miles of distribution system line surveyed.	1867

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?

   b. Describe the program:

   All accounts - without exception - are metered. Therefore, no retrofitting program or funding for same is necessary.

3. Number of previously unmetered accounts fitted with meters during report year. 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? yes

   a. If YES, when was the feasibility study conducted? (mm/dd/yy) 07/01/1997

   b. Describe the feasibility study:

   Discussions between Conservation, Customer Service & Information Systems revealed that not enough landscape accounts have mixed-use meters to make any changes/incentives possible.

2. Number of CII accounts with mixed-use meters. 2922

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

All CII dedicated landscape accounts with 3,000 sq. ft. or more have been put on water budgets since 1992

Reported as of 9/29/05

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	732
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	392
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	3729
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	2742
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	1/1/1997

b. Description of marketing / targeting strategy:

Monthly contacts -- some written, some oral/in person - every month. PDA classes offered to all water budget accounts & maintenance personnel.

2. Number of Surveys Offered.	0
3. Number of Surveys Completed.	0
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Review of Plan Checks, Assignement of Water Budgets, Orientation of Landscape/Irrigation Ordinance 72.19, and follow-up.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	no
2. Number of CII mixed-use accounts with landscape budgets.	0

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Review of Plan Checks, Assignment of Water Budget, Orientation of Landscape/Irrigation Ordinance 72.19, and follow-up. Monthly water consumption statement.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	38000	30000
2. Actual Expenditures	30307	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

No. A1 - relates to all dedicated landscape metered accounts in our sytem. No. A2 - relates to all dedicated landscape metered accts in our system that are active & have a full 12 months usage history. Also, note that No. A1 is less than previous reports due to accts converting to recycled water and/or being designated as under the 3,000 sq ft requirement. EMWD does charge "disincentive fees" from $100 - $500 dollars for going over water budgets by percentages on a 5 step/tiered scale.

Reported as of 9/29/05

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers?	yes
a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.	
The Gas Company offered rebates from $75 to $125, SCE offered rebates from $100 to $150. Rebates varied in amounts based on washers MEF Factor.	
2. Does your agency offer rebates for high-efficiency washers?	yes
3. What is the level of the rebate?	0
4. Number of rebates awarded.	553

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	5530	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases, Website and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	15
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	20
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	12
g. Speaker's Bureau	yes	10
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	40000	40000
2. Actual Expenditures	40500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	67	67368	0
Grades 4th-6th	yes	47	16252	0
Grades 7th-8th	yes	4	1825	0
High School	yes	10	12785	2

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	166320	180000
2. Actual Expenditures	170000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "numbers of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs used to reach students include: educational tours of EMWD facilities, a water conservation theatre program (assembly style presentation), free (new curriculum) water education materials, "water-wise" poster contest, website information, and classroom presentations. The numbers of students reached has increased over the past few years due to tremendous growth in the Inland Empire.

Reported as of 9/29/05

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	4	0	0
b. Number of New Surveys Completed	4	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	2	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	yes	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	48865	449	48865
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	176.37
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	57.36

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	2775	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
   - Potential savings
   - CII Sector or subsector

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   Special marketing material from Management Company (HDMC), contracted through Metropolitan Water District of Southern California (MWD), provided the tools to do individual target mailings.

2. How does your agency advertise this program? Check all that apply.
   - Direct letter
   - Bill message
   - Newsletter
   - Web page
   - Trade publications
   - Other print media
   - Trade shows and events
   - Telemarketing

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   Direct mailing of marketing of clip sheets. Also, advertising in customer newsletters and Chamber presentations.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes
3. What is the total number of customer accounts participating in the program during the last year ? — 3

CII Subsector	Number of Toilets Replaced			
4.	**Standard Gravity Tank**	**Air Assisted**	**Valve Floor Mount**	**Valve Wall Mount**
a. Offices	1	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	108	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0

f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	4
b. Inadequate payback	4
c. Inadequate ULFT performance	2
d. Lack of funding	5
e. American's with Disabilities Act	1
f. Permitting	1
g. Other. Please describe in B. 9.	0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Eastern has very limited CII Industry - a lot of new construction with low-flow toilets already installed.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

Participation level this fiscal year increased from the past year. Hopefully, we will continue to escalate customer participation

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	1500	1500
b. Materials	0	0
c. Marketing & Advertising	150	150
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	1650	1650

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	2220
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	2220

D. Comments

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$40136425
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$10071707
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$5266756
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$269468
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$4510148
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$1958212
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$13528
6. Other	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$2024754

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$44440

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	no
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	%
b. Coordinator's Name	
c. Coordinator's Title	
d. Coordinator's Experience and Number of Years	
e. Date Coordinator's position was created (mm/dd/yyyy)	
6. Number of conservation staff, including Conservation Coordinator.	5

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	152834	280000
2. Actual Expenditures	167912	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Ted Haring, former Conservation Coordinator, was hired as a part-time contract employee in April 2004 to conduct a number of conservation duties. Also, in June of 2004, Deb Whitney was hired as a Conservation Analyst. Therefore, in 2004-2005 fiscal year, the Conservation Department has 3 full-time & 2 part-time employees.

Reported as of 9/29/05

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Ordinance No. 72.19 provides special provisions for water conservation measures for golf courses & large landscape projects. In addition, several provisions for conservation ethics are included for all EMWD customers.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Moreno Valley, Hemet, Temecula, Murrieta, Perris & San Jacinto	All cities defer to EMWD's Ordinance No. 72.19

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	yes
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name Irrigation during hot/daylight hours. Water between midnight & 6:00 a.m.	yes

2. Describe measures that prohibit water uses listed above:

The Ordinance, requirements for new business connections (on file with CUWCC) and basic conservation messages/bill stuffers that are ongoing.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	yes
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site	

regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	yes
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	yes

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	4000	4000
2. Actual Expenditures	4000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Even though current law does not allow EMWD to prohibit residential on-site regeneration water softeners, our agency discourages this use when queried by customers. Also, Eastern's load limits into the sewer system for commercial water softeners takes care of itself.

Reported as of 9/29/05

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	643	58
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**643**	**58**

6. Describe your agency's ULFT program for single-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

7. Describe your agency's ULFT program for multi-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

N/A	N/A

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	35000	26000
2. Actual Expenditures	26115	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Less toilets rebated - no brochure printing this fiscal year.

Reported as of 9/29/05

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Wholesale**

Year: **2004**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	75868	Imported
EMWD	17685	Groundwater
EMWD	25094	Recycled

Total AF: 118647

Purchaser Information

Name of Agency	Quantity (AF) Supplied	Retailer or Wholesaler
Lake Hemet MWD	328	retail
City of Perris	2252	retail
DWR	63	wholesale
City of San Jacinto	84	retail
Western MWD	0	wholesale
Nuevo Water Company	752	retail
Murrieta County Water District	281	retail
City of Hemet	377	retail

Total AF: 4137

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	103045
b. Determine other system verifiable uses (AF)	336
c. Determine total supply into the system (AF)	106455
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1867
2. Number of miles of distribution system line surveyed.	1867

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	15
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	20
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	12
g. Speaker's Bureau	yes	10
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	40000	40000
2. Actual Expenditures	40500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	67	67368	0
Grades 4th-6th	yes	47	16252	0
Grades 7th-8th	yes	4	1825	0
High School	yes	10	12785	2

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	166320	180000
2. Actual Expenditures	170000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "number of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs include educational tours of EMWD facilities, a water conservation theater program (assembly style presentations), free water education materials, a "water-wise" poster contest and classroom presentations. The numbers listed reflect the total students reached through all of these programs. EMWD has seen growth in the area whigh has resulted in expanding programs to reach more students. As growth continues, the numbers will increase.

Reported as of 9/29/05

BMP 10: Wholesale Agency Assistance Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Financial Support by BMP

BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded	BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded
1	No	0	0	**8**	No	0	0
2	No	0	0	**9**	No	0	0
3	No	0	0	**10**	No	0	0
4	No	0	0	**11**	No	0	0
5	No	0	0	**12**	No	0	0
6	yes	0	0	**13**	No	0	0
7	No	0	0	**14**	yes	0	0

2. Technical Support

a. Has your agency conducted or funded workshops addressing CUWCC procedures for calculating program savings, costs and cost-effectiveness?	No
b. Has your agency conducted or funded workshops addressing retail agencies' BMP implementation reporting requirements?	No
c. Has your agency conducted or funded workshops addressing:	
1) ULFT replacement	No
2) Residential retrofits	No
3) Commercial, industrial, and institutional surveys	No
4) Residential and large turf irrigation	No
5) Conservation-related rates and pricing	No

3. Staff Resources by BMP

Qualified	No. FTE	Qualified	No. FTE

BMP	Staff Available for BMP?	Staff Assigned to BMP	BMP	Staff Available for BMP?	Staff Assigned to BMP
1	No		**8**	No	
2	No		**9**	No	
3	No		**10**	No	
4	No		**11**	No	
5	No		**12**	No	
6	No		**13**	No	
7	No		**14**	No	

4. Regional Programs by BMP

BMP	Implementation/ Management Program?	BMP	Implementation/ Management Program?
1	No	**8**	No
2	No	**9**	No
3	No	**10**	No
4	No	**11**	No
5	No	**12**	No
6	yes	**13**	No
7	No	**14**	yes

B. Wholesale Agency Assistance Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

EMWD encourages its few sub-agencies to participate in rebate programs. Presently, only one (Lake Hemet MWD) is getting MWD/EMWD pass thru funds for ULFTs and washers. However, it is our understanding that since MWD accounts for these funds, EMWD has to indicate a "No" on these items.

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

2. Commercial

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

3. Industrial

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

4. Institutional / Government

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

5. Irrigation

a. Water Rate Structure

b. Sewer Rate Structure

c. Total Revenue from Volumetric Rates $

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $

6. Other

a. Water Rate Structure Uniform

b. Sewer Rate Structure Uniform

c. Total Revenue from Volumetric Rates $2570154

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reason that this figure is less is due to Eastern's sales to Lake Elsinore MWD now being carried on Western Municipal WD books.

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	no
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	%
b. Coordinator's Name	
c. Coordinator's Title	
d. Coordinator's Experience and Number of Years	
e. Date Coordinator's position was created (mm/dd/yyyy)	12/1/1991
6. Number of conservation staff, including Conservation Coordinator.	5

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	152834	280000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Ted Haring, former Conservation Coordinator, was hired as a part-time contract employee in April 2004 to conduct a number of conservation duties. Also, in June of 2004, Deb Whitney was hired as a Conservation Anaylst. Therefore, in 2004-2005 fiscal year, the Conservation Department has 3 full-time & 2 part-time employees.

Reported as of 9/29/05

Appendix D - Water Shortage Contingency Plan

Eastern Municipal Water District

Water Shortage Contingency Plan

Ordinance No.117

Effective July 6, 2005

Attachment A

Table of Contents

Section I: Declaration of Purpose and Principles 3

Section II: Public Involvement 4

Section III: Public Education 4

Section IV: Coordination with Regional Water Planning Groups 4

Section V: Authorization Process 4

Section VI: Application 5

Section VII: Definitions 5

Section VIII: Criteria for Initiation/Termination of Water Shortage Contingency Stages 6

Section IX: Public Notification Procedures 7

Section X: Water Shortage Contingency Measures (Households) 7

Section XI: Water Shortage Contingency Measures (CII) 8

Section XII: Water Shortage Contingency Measures (Agriculture) 9

Section XIII: Enforcement 9

Section XIV: Variances 10

Water Shortage Contingency Plan
For Domestic (Potable) Water

Eastern Municipal Water District

Section I: Declaration of Purpose and Principles

In accordance with Water Code 10632 requirements, Eastern Municipal Water District (EMWD) is responsible for conserving the available water supply, protecting the integrity of water supply facilities (infrastructure), and implementing a contingency plan in times of drought, supply reductions, failure of water distribution systems or emergencies. Particular emphasis is placed on use of domestic (potable) water, sanitation, fire protection and preserving public health, welfare, and safety, in addition to minimizing the adverse impacts of water supply shortage or other water supply emergency conditions that do not include recycled water. Therefore, EMWD hereby adopts regulations and restrictions on the delivery and consumption of **potable outdoor water use only.**

Water Surplus and Drought Management Plan (WSDM) – Since EMWD purchases approximately 80 percent of its domestic (potable) water from the Metropolitan Water District of Southern California (MWD), the District recognizes the interdependence of surplus and shortage actions of MWD. WSDM is a coordinated plan utilizing all available resources to maximize supply reliability. The overall objective of the WSDM Plan is to ensure that shortage allocation of MWD's imported water supplies is NOT required. New regional storage projects and other on-going "drought-proofing" efforts by MWD and its member agencies have reduced the need for EMWD drought conservation targets in excess of those adopted by MWD through its WSDM and IRP Plans.

The overall policy objective of the WSDM allocation method will be to minimize the impacts to any one agency and the region as a whole. To meet that objective, the method of allocating firm imported supply will account for each agency's demands on Metropolitan, each agency's local resources, and each agency's total retail demands. **The WSDM Plan allocation will also take into account each agency's conservation and recycled water programs.**

In the event that the District was to implement the Water Shortage Contingency Plan (the Plan), it is recognized that the reduction in sales would impact the revenues that would normally be generated. To the extent that this reduction negatively impacts the coverage of its fixed related costs (those that are not tied to volume) the District will utilize its Rate Stabilization Reserve to mitigate any shortfall.

Potable water regulated or prohibited under the Plan is considered to be non-essential use; continuation of such uses during times of potable water shortage or other emergency water supply conditions are deemed to constitute a waste of water and will be subject to penalties as defined in Sections X, XI and XII of this Plan.

The Plan is based on the following priorities:

- Public safety, health and welfare
- Sustaining economic vitality
- Quality of life

Section II: Public Involvement

Opportunity for the public to provide input into the Plan is provided by public notice -- 30 days prior to implementation. See Section V for authorization process of Board of Directors and General Manager to activate the Water Shortage Contingency Plan.

Section III: Public Education

EMWD will periodically provide the public with information about the Plan, including conditions under which each stage of the Plan is to be initiated or terminated and the conservation response measures to be implemented in each stage. This information will be provided by means of public events, website, press releases, bill inserts, etc.

Section IV: Coordination with Regional Water Planning Groups

The service area of EMWD is located within the regional area of the Santa Ana Watershed Project Authority (SAWPA). In addition to SAWPA, coordination and implementation of this Plan are in concert with Metropolitan Water District's (MWD) Water Surplus and Drought Management Plan (WSDM) as well as the EMWD sub-agencies – Lake Hemet Municipal Water District, Nuevo Water Company, Murrieta County Water District, and the cities of Perris, Hemet and San Jacinto.

Section V: Authorization Process

A. Long and Short Term Water Deficiencies

   Driven by the requirements outlined in Water Code 10632, the District's General Manager shall request the Board of Directors to authorize and implement the provisions of the Plan, which declares that the demand for potable water consumption is anticipated to be in excess of the water supply. The request shall be made at a regular or special meeting of the Board of Directors where findings will dictate the necessity, if any, to implement provisions of the Plan. The Board of Directors shall have the authority to initiate or terminate the water shortage contingency measures described in this Plan.

B. Emergency Water Shortage Response

   By adopting this Plan, the Board of Directors authorizes the General Manager to declare the extent of potable water shortage emergency and to implement the appropriate water shortage contingency measures. The General Manager shall report such water shortage condition and level of response to the Board of Directors at a time which is reasonable and practicable. Refer to Water System Emergency Operation Procedures within the Urban Water Management Plan.

   The declaration of the Board shall be made by public announcement and shall be published in a newspaper of general circulation. The declaration shall become effective immediately upon such publication.

Section VI: Application

The water shortage contingency measures of this Plan shall apply to all persons, customers, and property utilizing potable water provided by EMWD. The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, agencies, associations, and all other legal entities.

Section VII: Definitions

For the purposes of this Plan**,** the following definitions shall apply:

Aesthetic water use: ornamental or decorative fountains, reflecting pools, and water gardens.

Base period: the period of time over which the customer's water use is computed.

Billing unit: the unit amount of water used to apply water rates for the purposes of calculating commodity charges for the customer water usage and equals 100 cubic feet or 748 gallons of water.

Commercial, Industrial and Institutional (CII): non-profit establishments, governmental entities, schools, retail establishments, hotels, motels, restaurants, car washes and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that supply is conserved and made available for future or alternative uses.

Customer: any person, company, agency, or organization using water supplied by EMWD.

Customer Classifications: residential, commercial, industrial, institutional, agriculture, large landscape accounts, wholesale (sub-agencies).

District: Eastern Municipal Water District.

Domestic water: used for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution. Also used for landscape irrigation.

Even numbered address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Historical base period: any customer who was not a customer during the full historical base period shall be assigned an average daily usage by the District.

Household: residential premises served by the customer's meter.

Industrial water use: processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Lifeline: Amount of water necessary to meet a household's minimum needs for health, safety and sanitation.

Non-essential water use: not essential or required for the protection of public, health, safety and welfare.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

Potable water: filtered/treated water suitable for drinking; also used for household needs and landscape irrigation.

Water Shortage Contingency Plan: the Plan

Water shortage: a condition in which the existing or projected potable water supply available to EMWD is not anticipated to meet the water requirements of its customers. This condition may be the result of factors including, but not limited to, voluntary or mandatory curtailment of the District's allocation from the Metropolitan Water District of Southern California (MWD), drought, emergency conditions or failure of water distribution systems.

Water shortage period: the period beginning on the effective date of the Board of Directors approval of implementing EMWD's Water Shortage Contingency Plan, and ending on the date of the General Manager's finding that a potable water shortage no longer exists.

Section VIII: Criteria for Initiation/Termination of Water Shortage Contingency Stages

At a time of long or short-term drought conditions or other emergencies, EMWD shall continue to monitor potable water supply shortage conditions on a regular basis and shall determine when conditions warrant initiation or termination of each stage of the Plan as follows:

A. Stage 1: When water deficiencies range between 5 and 10 percent (voluntary stage).

B. Stage 2: When water deficiencies range from more than 10 percent and up to 25 percent (mandatory stage).

C. Stage 3: When water deficiencies range from more than 25 percent and up to 50 percent (mandatory stage).

D. Stage 4: When water deficiencies are more than 50 percent (mandatory stage).

Section IX: Public Notification Procedures

When the District determines that a potable water shortage condition exists, any or all of the following notification procedures may be implemented:

A. Notify the general public and influential local decision-makers what the situation is, what actions should be taken, what they are intended to achieve, and how these actions are to be implemented.

B. The public at large will be informed of the situation and what must be done. Contact can be made through billing inserts, water conservation booths, speaker's bureau, community association meetings, newsletters, education programs, etc. Literature should be provided on the potable water shortage condition, conservation methods, and water-savings devices.

C. Use of media in all its available forms should be employed. This would include public service announcements on radio and cable television as well as press releases in local newspapers.

D. Post all pertinent information on the District's web site.

Section X: Water Shortage Contingency Measures (Households)

A. Stage 1: When potable water deficiencies range between 5 and 10 percent. The following water use restrictions are voluntary under Stage 1 and mandatory under Stage 2 or greater:

1. Do not hose down driveways or any other hard surfaces except for health or sanitary reasons. Use a broom or blower instead.
2. Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering). Adjust automatic timer clocks accordingly.
3. Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.
4. Refrain from using decorative fountains unless they are equipped with a recycling system.
5. Where possible, install pool and spa covers to minimize water loss due to evaporation.
6. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve.

NOTE*: The above measures are similar to on-going conservation procedures followed under existing Ordinance No. 72.19.*

B. Stage 2: When water deficiencies range from more than 10 percent and up to 25 percent. Customers shall be requested to adhere to restrictions prescribed in Stage 1 on a mandatory basis, in addition to the following mandatory water use restrictions:

1. No replacement water will be provided for ponds, lakes, etc.

C. Stage 3: When water deficiencies range from more than 25 percent and up to 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 and 2, in addition to the following mandatory water use restrictions:

1. Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.
2. The use of water from fire hydrants shall be limited to fire fighting and related activities.
3. Water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.
4. Outdoor irrigation by sprinklers will only be allowed on even-numbered days of the month for those locations with a street address ending in an **even last digit.** Outdoor irrigation of locations not having a street address shall irrigate on even-numbered days of the month.
5. Outdoor irrigation by sprinklers will only be allowed on odd-numbered days of the month for those locations with a street address in an **odd last digit.**
6. Washing of autos, trucks, trailers, motor homes, boats, airplanes or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables.

D. Stage 4: When water deficiencies are more than 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 through 3, in addition to the following mandatory water use restrictions:

1. Irrigation of landscaping is only allowed twice per week with hand-held hose only.
2. No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.
3. No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.
4. All new landscaping shall be limited to drought-tolerant plantings as determined by the District.
5. No new lawns/turf, whether by seed or sod, shall be permitted.
6. No person or entity shall be required to implement any new landscaping requirements of any association, developer or governing agency until the termination of Stage 4.
7. Use of water by all types of commercial car washes shall be reduced in volume by 50 percent.

Section XI: Water Shortage Contingency Measures (CII)

A. Stage 1: When potable water deficiencies range between 5 and 10 percent. Customers shall be requested to adhere to restrictions prescribed in Stage 1 of Section X in addition to the following voluntary water use restriction:

1. Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100 percent of ET) to 0.8 (80 percent of ET).

B. Stage 2: When potable water deficiencies range from more than 10 percent and up

to 25 percent. Customers shall be requested to adhere to restrictions prescribed in Stage 1 of Section X on a mandatory basis.

C. Stage 3: When potable water deficiencies range from more than 25 percent and up to 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 and 2 of Section X, in addition to the following mandatory water use restriction:

1. Landscape meters to 75 percent of ET.

D. Stage 4: When potable water deficiencies are more than 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 through 3 in Section X, in addition to the following mandatory water use restriction:

1. Landscape meters to 60 percent of ET.

Section XII: Water Shortage Contingency Measures (Agriculture)

A. Stage 4: When potable water deficiencies are more than 50 percent. Customers shall be requested to adhere to the following mandatory restriction:

1. Based on interruptible agriculture water from MWD, field and row crops may be discontinued.

Section XIII: Enforcement

A. No person or entity shall knowingly or intentionally allow the use of potable water from the District for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the water shortage response stage in effect at the time pursuant to action taken by District, in accordance with provisions of this Plan.

B. The various responses to drought or emergencies described in previous sections are intended to avoid or defer the need for rationing community water supplies, while preserving some latitude of choice with respect to how much potable water individual customers use. However, the success of this framework depends on all customers using water efficiently. In the event of unreasonable use or waste, the District reserves the right to impose penalties in addition to the financial disincentives described, including the right to install flow restrictors or to shut off supply.

C. If a person or entity knowingly or intentionally violates the provision of the Plan, the Board of Directors may choose to implement either the event driven or tiered rate penalties as described below:

1. Event-driven penalties:

NOTE: *For irrigation/landscape accounts, the penalties listed below are in addition to the current Annual Assessment Schedule in Ordinance No. 72.19.*

a. For the first monthly violation of these sub-sections, the District shall issue a written notice of fact of such violation to the customer.
b. For the second and third month violations, a surcharge of 100% of current water bill commodity charge shall be added to the customer's water bill.
c. For the fourth and succeeding month(s) violation, a surcharge of 200% of current water bill commodity charge shall be added to the customer's water bill.
d. Thereafter, the District may install a flow restricting device of one gallon per minute (1 GPM) capacity for services up to 1 ½" size and comparatively sized restrictors for larger services.
e. The District may also terminate a customer's irrigation/landscape meter service.

NOTE*: Flow restricting devices and/or termination of service will only be undertaken after a hearing held by a review board where the customer has an opportunity to respond to the District's evidence that the customer has repeatedly violated this chapter's rules regarding the conservation of potable water and that such action is reasonably necessary to assure compliance with this Plan. Prior to any restoration of the service, the customer shall pay all District charges for any restriction or termination of service and its restoration.*

2. Tiered rate penalty:

a. The District shall have the option to impose a tiered rate system that will provide for charges and/or penalties for higher consumption of water over and above the requirements stated herein throughout Stages 1 through 4 of this Plan.

NOTE: *In the event the historical commodity cannot be established using actual recorded amounts of potable water used by a customer during the corresponding billing period in the calendar year preceding the potable water shortage period, the District shall assign the historical commodity.*

Section XIV: Variances

A. The District may, in writing, grant temporary variance for existing potable water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance, and if one or more of the following conditions are met:

1. Compliance with this Plan cannot be technically accomplished during the duration of the potable water supply shortage or other condition for which the Plan is in effect.
2. Alternative methods can be implemented which will achieve the same level of reduction in potable water use.

B. Persons requesting an exemption from the provisions of this Ordinance shall file a petition for variance with the District within 10 days after the Plan or a particular

drought/emergency response stage has been invoked. All petitions for variances shall be reviewed by the District, and shall include the following:

1. Name and address of the petitioner(s).
2. Purpose of potable water use.
3. Specific provision(s) of the Plan from which the petitioner is requesting relief.
4. Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Plan.
5. Description of the relief requested.
6. Period of time for which the variance is sought.
7. Alternative water use restrictions or other measures the petitioner is taking or proposes.
8. Alternative potable water use restrictions or other measures the petitioner is taking, or proposes to take, to meet the intent of this Plan and the compliance date.
9. Other pertinent information.

C. Variances granted by the District shall be subject to the following conditions, unless waived or modified by the District:

1. Variances granted shall include a timetable for compliance.
2. Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

D. No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

Appendix E - List of References

**Hemet San Jacinto Water Management Area 2004 Annual Report*, Eastern Municipal Water District, June 2005.

***Integrated water Resources Plan 2003 Update,* The Metropolitan Water District of Southern California, May 2004.

Market Absorption Analysis Eastern Municipal Water District Hemet San Jacinto Area, Empire Economics Inc, October 2004.

Market Absorption Analysis Eastern Municipal Water District Moreno Valley Study Area Empire Economics Inc, April 2005.

Market Absorption Analysis Eastern Municipal Water District Perris Valley North Study Area, Empire Economics Inc, April 2005.

Market Absorption Analysis Eastern Municipal Water District Perris Valley West Study Area, Empire Economics Inc, April 2005.

Market Absorption Analysis Eastern Municipal Water District Salt Creek Corridor, Empire Economics Inc, May 2004.

**The Metropolitan Water district of Southern California, Regional Urban Water Management Plan*, The Metropolitan Water District of Southern California, September 2005.*

Riverside County Integrated Plan, County of Riverside, 2003
www.rcip.org

Socioeconomic Forecast Study Eastern Municipal Water District, Empire Economics Inc, May 2003.

Water Shortage Emergency Operations Procedure Manual, Eastern Municipal Water District, December 2005.

**West San Jacinto Groundwater Basin Management Plan 2004 Annual Report*, Eastern Municipal Water District, April 2005.

* Available on EMWD's website at EMWD.org

** Available on MWD's website at. mwdh2o.com

Appendix F - Department of Water Resources Checklist

DWR Checklist

	Reference
Coordination with Appropriate Agencies	**(Water Code § 10620 (d)(1)(2))**
Participated in area, regional, watershed or basin wide plan	N/A
Describe the coordination of the plan preparation and anticipated benefits.	Appendix A
Table 1 is included in Appendix 1	
Describe resource maximization / import minimization plan	**(Water Code §10620 (f))**
Describe how water management tools / options maximize resources & minimize need to import water	Groundwater Page 13,15-30 Recycled Water Page 14, 71-75
EMWD has made effort to protect and maximize the local resources of groundwater and recycled water. These efforts are discussed in the groundwater and recycled water portions of the plan.	
Plan Updated in Years Ending in Five and Zero	**(Water Code § 10621(a))**
Date updated and adopted plan received	Adopted December 21,2005
City and County Notification and Participation	**(Water Code § 10621(b))**
Notify any city or county within service area of UWMP of plan review & revision	Appendix A
Consult and obtain comments from cities and counties within service area	Appendix A
Service Area Information	**Water Code § 10631 (a))**
Include current and projected population	Table 1.2 Page
Population projections were based on data from state, regional or local agency	Section 1
Population - Current and Projected	Section 1
Describe climate characteristics that affect water management	Section 1
Describe other demographic factors affecting water management	Section 1
Climate	Table 1.3
Water Sources	**(Water Code § 10631 (b))**
Identify existing and planned water supply sources	Section 2
Provide current water supply quantities	Tables 2.1-2.3
Provide planned water supply quantities	Tables 2.1-2.3
Current And Planned Water Supplies - AFY	Tables 2.1-2.3

DWR Checklist

If Groundwater identified as existing or planned source	(Water Code §10631 (b)(1-4))
Has management plan	Yes - West San Jacinto No- Hemet/San Jacinto Basin
Attached management plan (b)(1)	Appendix B (Plan)and Appendix G (MOUs)
Description of basin(s) (b)(2)	Section 3 Basin Description
Basin is adjudicated	NA
If adjudicated, attached order or decree (b)(2)	NA
Quantified amount of legal pumping right (b)(2)	Section 3 Groundwater Pumping Rights
Groundwater Pumping Rights - AF Year	Section 3 Groundwater Pumping Rights
DWR identified, or projected to be, in overdraft (b)(2)	Yes
Plan to eliminate overdraft (b)(2)	Section 3, Groundwater Management
Analysis of location, amount & sufficiency, last five years (b)(3)	Section 3, Past Production
Analysis of location & amount projected, 20 years (b)(4)	Section 3, Projected Production
Amount of Groundwater pumped - AFY	Table 3.4
Amount of Groundwater projected to be pumped - AFY	Table 3.5
Reliability of Supply	**(Water Code §10631 (c) (1-3)**
Describes the reliability of the water supply and vulnerability to seasonal or climatic shortage	Section 4
Supply Reliability - AF Year	Table 4.1
Water Sources Not Available on a Consistent Basis	**(Water Code §10631 (c))**
Describe the reliability of the water supply due to seasonal or climatic shortages	Section 4
Describe the vulnerability of the water supply to seasonal or climatic shortages	Section 4
No unreliable sources	
Factors resulting in inconsistency of supply	NA
Describe plans to supplement or replace inconsistent sources with alternative sources or DMMs	NA
No inconsistent sources	Yes

DWR Checklist

Transfer or Exchange Opportunities	(Water Code §10631 (d))
Describe short term and long term exchange or transfer opportunities	Section 5
No transfer opportunities	Under Development
Transfer and Exchange Opportunities - AF Year	NA
Water Use Provisions	**(Water Code §10631 (e)(1)(2))**
Quantify past water use by sector	Section 6
Quantify current water use by sector	Section 6 Retail Sectors
Project future water use by sector	Section 6 Retail Sectors
Past, Current and Projected Water Deliveries	Table 6.1
Identify and quantify sales to other agencies	Section 6 Wholesale to Other Agencies
No sales to other agencies	NA
Sales to Other Agencies - AFYear	Table 6.3
Additional Water Uses and Loses- AFYear	Table 6.4
Total Water Use - AFYear	Table 6.5

Planned Water Supply Projects and Programs, including non-implemented DMMs	(Water Code §10631 (g))
No non-implemented / not scheduled DMMs	Section 7

Planned Water Supply Projects and Programs	(Water Code §10631 (h))
No future water supply projects or programs	NA
Detailed description of expected future supply projects & programs	Section 8
Timeline for each proposed project	Table 8.2
Quantification of each projects normal yield (AFY)	Table 8.1
Quantification of each projects single dry-year yield (AFY)	Table 8.1
Quantification of each projects multiple dry-year yield (AFY)	Table 8.1
Future Water Supply Projects	Tables 8.2 & 8.1

Opportunities for development of desalinated water	(Water Code §10631 (i))
Describes opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply	Desalination plants for groundwater are discussed in Section 2 & 3. Recycled water desalination discussed in Section 9.
No opportunities for development of desalinated water	NA
Opportunities for desalinated water	Table 9.1

DWR Checklist

District is a CUWCC signatory	(Water Code § 10631 (j))
Urban suppliers that are California Urban Water Conservation Council members may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).	Yes
The supplier's CUWCC Best Management Practices Report should be attached to the UWMP.	Appendix C
Agency is a CUWCC member	Yes
2003-04 annual updates are attached to plan	Appendix C
Both annual updates are considered completed by CUWCC website	Yes

If Supplier receives or projects receiving water from a wholesale supplier	(Water Code §10631 (k))
Agency receives, or projects receiving, wholesale water	Yes
Agency provided written demand projections to wholesaler, 20 years	Coordinated with MWD over several months providing information about population and supply.
Agency demand projections provided to wholesale suppliers - AFY	Table 10.2
Wholesaler provided written water availability projections, by source, to agency, 20 years	MWD provided RUWMP with regional projections.
Wholesaler identified & quantified the existing and planned sources of water- AFY	
Wholesale Supply Reliability - % of normal AFY	100%
Factors resulting in inconsistency of wholesaler's supply	NA

Water Shortage Contingency Plan Section	(Water Code § 10632)
Stages of Action	**(Water Code § 10632 (a))**
Provide stages of action	Section 11, Stages of Action
Provide the water supply conditions for each stage	Section 11, Stages of Action
Includes plan for 50 percent supply shortage	Section 11, Stages of Action
Water Supply Shortage Stages and Conditions	Table 11.1

three-year Minimum Water Supply	(Water Code §10632 (b))
Identifies driest 3-year period	Section 11, Estimate of Minimum Supply
Minimum water supply available by source for the next three years	Section 11, Estimate of Minimum Supply
three-year Estimated Minimum Water Supply - AF Year	Table 11.2

Preparation for catastrophic water supply interruption	(Water Code §10632 (c))

DWR Checklist

Provided catastrophic supply interruption plan	Section 11, Catastrophic Supply Interruption
Preparation Actions for a Catastrophe	Section 11, Catastrophic Supply Interruption

Prohibitions	**(Water Code § 10632 (d))**
List the mandatory prohibitions against specific water use practices during water shortages	Section 11, Prohibition, Penalties and Consumption Reduction Methods
Mandatory Prohibitions	Table 11.3

DWR Checklist

Consumption Reduction Methods	(Water Code § 10632 (e))
List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction.	Section 11, Prohibition, Penalties and Consumption Reduction Methods
Consumption Reduction Methods	Table 11.4

Penalties	(Water Code § 10632 (f))
List excessive use penalties or charges for excessive use	Section 11, Prohibition, Penalties and Consumption Reduction Methods
Penalties and Charges	Table 11.5

Revenue and Expenditure Impacts	(Water Code § 10632 (g))
Describe how actions and conditions impact revenues	Section 11, Analysis of Revenue Table 11.6
Describe how actions and conditions impact expenditures	Section 11, Analysis of Revenue Table 11.7
Describe measures to overcome the revenue and expenditure impacts	Section 11, Analysis of Revenue
Proposed measures to overcome revenue impacts	Table 11.8
Proposed measures to overcome expenditure impacts	Table 11.8

Water Shortage Contingency Ordinance/Resolution	(Water Code § 10632 (h))
Attach a copy of the draft water shortage contingency resolution or ordinance.	Appendix D

Reduction Measuring Mechanism	(Water Code § 10632 (i))
Provided mechanisms for determining actual reductions	Section 11, Monitoring
Water Use Monitoring Mechanisms	Table 11.9

Recycling Plan Agency Coordination	Water Code § 10633
Describe the coordination of the recycling plan preparation information to the extent available..	Section 12, Planning Coordination
Participating agencies	Table 12.1

Wastewater System Description	(Water Code § 10633 (a))
Describe the wastewater collection and treatment systems in the supplier's service area	Section 12, Wastewater Quantity, Quality and Current Use
Quantify the volume of wastewater collected and treated	Section 12, Wastewater Quantity, Quality and Current Use
Wastewater Collection and Treatment - AF Year	Table 12.3

DWR Checklist

Wastewater Disposal and Recycled Water Uses	(Water Code § 10633 (a - d))
Describes methods of wastewater disposal	Section 12, Wastewater Quantity, Quality and Current Use
Describe the current type, place and use of recycled water	Section 12, Wastewater Quantity, Quality and Current Use
None	Section 12, Wastewater Quantity, Quality and Current Use
Describe and quantify potential uses of recycled water	Section 12, Wastewater Quantity, Quality and Current Use
Disposal of wastewater (non-recycled) AF Year	Table 12.4
Recycled Water Uses - Actual and Potential (AFY)	Table 12.5
Determination of technical and economic feasibility of serving the potential uses	

Projected Uses of Recycled Water	(Water Code § 10633 (e))
Projected use of recycled water, 20 years	Section 12, Potential and Projected Use , Optimization Plan with Incentives
Projected Future Use of Recycled Water in Service Area - AF Year	Table 12.6
Recycled Water Uses - 2000 Projection compared with 2005 actual - AFY	Table 12.7

Plan to Optimize Use of Recycled Water	(Water Code § 10633 (f))
Describe actions that might be taken to encourage recycled water uses	Section 12, Methods to Encourage Recycled Water Use
Describe projected results of these actions in terms of acre-feet of recycled water used per year	Unknown
Methods to Encourage Recycled Water Use	Section 12, Methods to Encourage Recycled Water Use
Provide a recycled water use optimization plan which includes actions to facilitate the use of recycled water (dual distribution systems, promote recirculating uses)	Section 12, Methods to Encourage Recycled Water Use

Water quality impacts on availability of supply	(Water Code §10634)
Discusses water quality impacts (by source) upon water management strategies and supply reliability	Section 13
No water quality impacts projected	
Current & projected water supply changes due to water quality - percentage	Tables 13.1-13.4

DWR Checklist

Supply and Demand Comparison to 20 Years	(Water Code § 10635 (a))
Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.	Section 14
Projected Normal Water Supply - AF Year	Table 14.1
Projected Normal Water Demand - AF Year	Table 14.2
Projected Supply and Demand Comparison - AF Year	

DWR Checklist

Supply and Demand Comparison: Single-dry Year Scenario	(Water Code § 10635 (a))
Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments.	Section 15
Projected single dry year Water Supply - AF Year	Table 15.1
Projected single dry year Water Demand - AF Year	Table 15.2
Projected single dry year Supply and Demand Comparison - AF Year	Table 15.3

Supply and Demand Comparison: Multiple-dry Year Scenario	(Water Code § 10635 (a))
Project a multiple-dry year period (as identified in Table 9) occurring between 2006-2010 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2010 - AF Year	Table 16.1
Projected demand multiple dry year period ending in 2010 - AFY	Table 16.2
Projected Supply and Demand Comparison during multiple dry year period ending in 2010- AF Year	Table 16.3
Project a multiple-dry year period (as identified in Table 9) occurring between 2011-2015 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2015 - AF Year	Table 16.4
Projected demand multiple dry year period ending in 2015 - AFY	Table 16.5
Projected Supply and Demand Comparison during multiple dry year period ending in 2015- AF Year	Table 16.6
Project a multiple-dry year period (as identified in Table 9) occurring between 2016-2020 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2020 - AF Year	Table 16.7
Projected demand multiple dry year period ending in 2020 - AFY	Table 16.8
Projected Supply and Demand Comparison during multiple dry year period ending in 2020- AF Year	Table 16.9
Project a multiple-dry year period (as identified in Table 9) occurring between 2021-2025 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2025 - AF Year	Table 16.10
Projected demand multiple dry year period ending in 2025 - AFY	Table 16.11
Projected Supply and Demand Comparison during multiple dry year period ending in 2025- AF Year	Table 16.12

DWR Checklist

Provision of Water Service Reliability section to cities/counties within service area	(Water Code § 10635(b))
Provided Water Service Reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR	

Does the Plan Include Public Participation and Plan Adoption	(Water Code § 10642)
Attach a copy of adoption resolution	
Encourage involvement of social, cultural & economic community groups	
Plan available for public inspection	
Provide proof of public hearing	
Provided meeting notice to local governments	

Review of implementation of 2000 UWMP	(Water Code § 10643)
Reviewed implementation plan and schedule of 2000 UWMP	
Implemented in accordance with the schedule set forth in plan	
2000 UWMP not required	

Provision of 2005 UWMP to local governments	(Water Code § 10644 (a))
Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption	

Does the plan or correspondence accompanying it show where it is available for pu	(Water Code § 10645)
Does UWMP or correspondence accompanying it show where it is available for public review	

Appendix G – Cooperative Agreements – Hemet/San Jacinto Water Management Area

1. MOU to Work Cooperatively to Promote Conjunctive Use Projects and Programs in the Upper San Jacinto River Basins (with Dept. of Water Resources), June 2001.

2. Agreement to Develop a Groundwater Monitoring Program in the Hemet/ San Jacinto Management Area, September 2003.

3. Agreement for Principles for Water Management, February 2004.

4. MOU for Interim Water Supply Plan, April 2004.

5. MOU for Preparation of Water Management Plan for the Hemet/San Jacinto Management Area, June 2004.

MEMORANDUM OF UNDERSTANDING
TO WORK COOPERATIVELY TO PROMOTE CONJUNCTIVE USE PROJECTS AND PROGRAMS IN UPPER SAN JACINTO RIVER BASINS

This Memorandum of Understanding (MOU) is entered into this 19TH day of June, 2001, by and between the California Department of Water Resources (DWR) and the City of San Jacinto, City of Hemet, Lake Hemet Municipal Water District, and Eastern Municipal Water District, also referred to collectively as "the Parties".

RECITALS

A. Groundwater in the Upper San Jacinto River Basins has been and will remain a significant source of the water for the people, environment, and agribusiness of Riverside County and provides an invaluable contribution to the local economy and public well being.

B. The City of San Jacinto, City of Hemet, Lake Hemet Municipal Water District, and Eastern Municipal Water District strive to increase the availability and reliability of local ground and surface water resources in Riverside County.

C. The City of San Jacinto, City of Hemet, Lake Hemet Municipal Water District, and Eastern Municipal Water District have an interest in the management of their groundwater resources.

D. The Parties recognize that there is the potential for conjunctive management of ground and surface water resources, and are willing to explore the possibility of increasing the availability of dry-year supplies through regional conjunctive use efforts.

E. DWR seeks to facilitate and support local groundwater management efforts, particularly those that could increase dry-year water supplies, within the safe-yield and without the overdraft of groundwater basins.

F. Cooperation, open communication, and consensus building among the Upper San Jacinto River Basins stakeholders are recognized as prerequisites to deciding on any preferred action.

G. The Parties have determined that further study of the feasibility and practicality of developing a groundwater conjunctive use program is necessary for the accurate evaluation of the safe yield of the Upper San Jacinto River Basins.

ARTICLES

NOW, THEREFORE, the Parties recognize that this MOU is a statement of principles and not a binding agreement, and the Parties agree to the following principles:

1. The Parties will work cooperatively to formulate a conjunctive water management program, identifying potentially feasible initiatives, programs, or projects that enhance the dependable yield of the Upper San Jacinto River Basins. An initial review of possible programs or projects shall be undertaken to identify actions that will provide water supply benefits and are technically, environmentally, economically, institutionally, socially, and legally feasible. This initial review shall be commonly referred to as "Phase I". An outline of the Phase I work, attached to this MOU as Appendix A, covers specific tasks that are to be performed as part of this initial review.

2. When the Parties have reached agreement on completion of Phase I, as described in Article 1 of this MOU, other activities to be completed cooperatively may include evaluation of large-scale groundwater banking and exchange, investigation of additional banking and exchange pilot projects, and implementation of an expanded groundwater monitoring and data management program.

3. To accomplish specific tasks outlined in Article 2, the Parties will enter into agreements that define the scope of work, cost sharing, schedule, and other details. Such specific agreements will be supplementary to, and consistent with, the objectives of this MOU.

4. The Parties will share all technical data, analyses, conclusions, and findings developed through the course of implementing this MOU.

Appendix A

Tasks

1. Establish an Upper San Jacinto River Basins Advisory Panel of local civic and technical leaders, and other stakeholders, to facilitate the feasibility evaluation of a conjunctive water management study for the Upper San Jacinto River Basins.

2. Develop and implement an outreach program for interested parties within the Upper San Jacinto River Basins throughout the planning process to share and exchange information, foster open and honest communication, and build consensus and reach a decision on possible courses of action.

3. Identify current and future water needs of stakeholders in the Upper San Jacinto River Basins, ensuring that all related needs are identified including environmental and third party needs.

4. Identify potential conjunctive water management projects in the Upper San Jacinto River Basins that can help address local water supply issues and needs while concurrently helping improve the overall dry year water supply reliability.

5. Jointly prepare a programmatic feasibility evaluation report, identifying specific conjunctive water management project and program options for the Upper San Jacinto River Basins.

6. As part of the programmatic feasibility evaluation, conduct a preliminary environmental review, identifying the impacts of potential projects or programs, including possible third party impacts, and possible measures that could avoid or mitigate the impacts.

7. As part of the programmatic feasibility evaluation, outline the principles of, and operating criteria for, the various potential basin-wide conjunctive water management scenarios and projects.

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

City of Hemet

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

Eastern Municipal Water District

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

Lake Hemet Municipal Water District

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

City of San Jacinto

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

AGREEMENT TO DEVELOP A GROUNDWATER MONITORING PROGRAM IN THE HEMET/SAN JACINTO MANAGEMENT AREA

THIS AGREEMENT is made and entered into by and among the following entities, which are hereinafter collectively referred to as the "AGENCIES."

City of Hemet
Lake Hemet Municipal Water District

City of San Jacinto
Eastern Municipal Water District

I. RECITALS

A - Background:

1. Groundwater in the Hemet/San Jacinto Management Area has been, and will remain, a significant source of water for the people and agribusiness of Riverside County providing an invaluable contribution to the local economy and public good.
2. The Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District, and Eastern Municipal Water District strive to increase the availability and reliability of local surface and ground water resources in the area.
3. The Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District, and Eastern Municipal Water District have an interest in the management of local water resources within the Hemet/San Jacinto Management Area.
4. The Department of Water Resources seeks to support local groundwater management efforts, particularly those that could increase dry-year water supplies, within the safe yield and without the overdraft of groundwater resources.
5. Through cooperation, open communication, and consensus building among the AGENCIES, the Hemet/San Jacinto Groundwater Policy and Technical Committees were formed in June of 2001 to identify programs needed to improve groundwater resources management in the area.
6. The AGENCIES have determined that development and implementation of a groundwater monitoring program is necessary for the accurate evaluation of the operational yield of the Hemet/San Jacinto Management Area.

B – The Purpose of this Agreement:

1. Develop a Monitoring Program in the Hemet/San Jacinto Management Area.
2. Appoint Eastern Municipal Water District as the Monitoring Program Administrator.
3. Establish an equitable funding mechanism among the Agencies to collect and fund the Monitoring Program.

II. COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals and mutual covenants contained herein, the AGENCIES hereby agree as follows:

A Develop a Groundwater Monitoring Program:
The AGENCIES and other private groundwater producers in the area hereby agree to develop the Groundwater Monitoring Program, as more specifically provided for in Attachment 1.

B Roles and Responsibilities of the AGENCIES:
The AGENCIES shall perform the duties as more specifically provided for in Attachment 1.

C Monitoring Program Costs:
A total of $200,000 is estimated to be required for the meter installation and first year operation of the monitoring program. This amount includes contingencies and uncertainties associated with such monitoring programs. Attachment 1 contains detailed cost estimates.
It is anticipated that Department of Water Resources (DWR) will contribute $100,000 of the $200,000 estimated cost for the meter installation and first year implementation of the monitoring program, provided the Agencies agree to fund and implement the monitoring program into future years pursuant to Covenant II.D, below.

D Cost Sharing of the Monitoring Program:
Until the full implementation of the Water Management Plan, the AGENCIES will share the annual Monitoring Program costs based on their base groundwater production percentages as determined by the Hemet/San Jacinto Groundwater Policy Committee and shown below:

Cost Sharing Prior to Plan Implementation			
Agency	**Base Production (AF)**	**Percentage**	**Cost Contribution**
City of Hemet	6,320	19.6 %	$ 19,600
City of San Jacinto	4,031	12.5 %	$ 12,500
LHMWD.	11,063	34.2 %	$ 34,200
EMWD	10,869	33.7 %	$ 33,700
Totals	**32,283**	**100.0 %**	**$100,000**

As noted above, the AGENCIES' share of the first year's budget is $100,00. Future years' budgets will be approved by the Hemet/San Jacinto Groundwater Policy Committee, and incorporate any excesses or deficits from prior years.

E Term of the Agreement:
This Agreement shall terminate, unless extended by mutual agreement of the AGENCIES, on the date a stipulated judgment for the Water Management Plan is executed by the AGENCIES provided that all debts and liabilities of the Monitoring Program are satisfied.

An Agency may terminate its participation in this agreement on an anniversary date of the Agreement by given the other Agencies written notice three months prior to that anniversary date.

F Ownership of Documents:
All data and reports produced shall become the joint property of the AGENCIES.

G Effective Date:
This Agreement shall become effective upon execution by all AGENCIES pursuant to authorization by each AGENCY's Governing Board.

H Counterparts:
This Agreement may be executed in original counterparts, which together shall constitute a single agreement.

IN WITNESS WHEREOF, the AGENCIES have executed this Agreement on the date set forth below.

CITY OF HEMET

DATE 9/13/03 BY _____
City Manager

CITY OF SAN JACINTO

DATE 9-16-03 BY _____
City Manager

LAKE HEMET MUNICIPAL WATER DISTRICT

DATE 9/16/03 BY _____
General Manager

EASTERN MUNICIPAL WATER DISTRICT

DATE 9/19/03 BY _____
General Manager

ATTACHMENT 1
Hemet/San Jacinto Management Area
Groundwater Monitoring Program

1. INTRODUCTION

In order to implement a sound Water Management Plan, it is necessary to have adequate data on which to base decisions. The purpose of the groundwater monitoring program is to collect, analyze, and compile water level, water quality, and groundwater production data for the administration and implementation of the Water Management Plan. The Hemet/San Jacinto Management Area is shown in Figure 1. The program provides the information necessary for a comprehensive view of the groundwater basins. The groundwater monitoring program includes the following elements:

- Water Level Monitoring
- Water Quality Monitoring
- Groundwater Extraction Monitoring
- Inactive Well Capping/Sealing

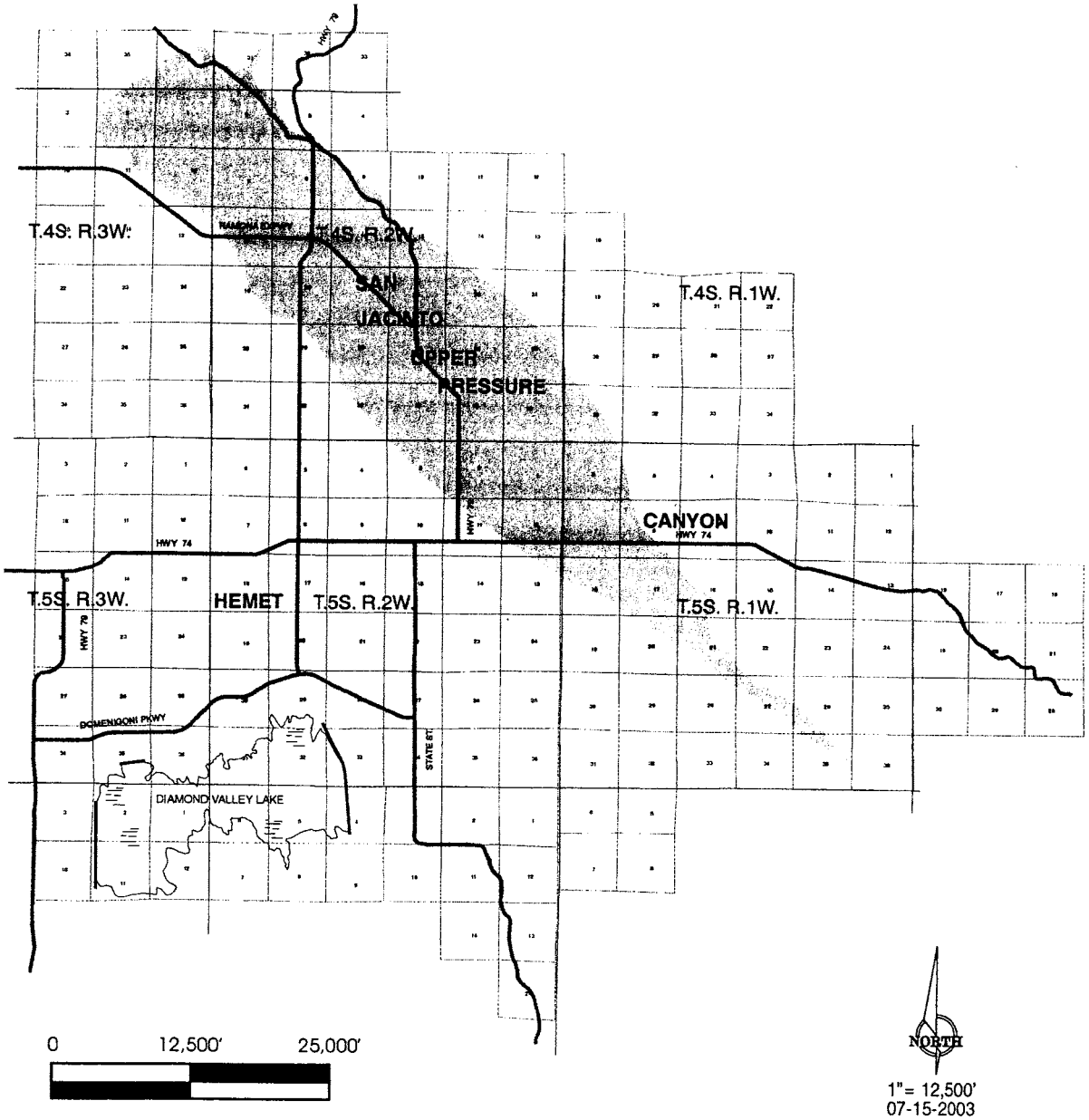
Data management and reporting are also key elements. Collected data will be entered into the EMWD's Regional Water Resources Database (RWRD). An annual report will summarize the monitoring activities and results of the analyses of the monitoring data, as well as provide other pertinent information regarding activities in the local management zones.

Water level and groundwater extraction data will be used to quantify basin stresses and to provide data for estimation of overdraft conditions within any given year and to provide the basis for the following year replenishment. Water quality information will be used to track basin water quality trends. Such data allows for characterization of basin hydrology, evaluation of groundwater flow conditions, and monitoring of groundwater quality improvement or degradation. In addition, inactive, unused wells will be capped/sealed as they are potential sources of groundwater contamination and present hazardous conditions. The water level and extraction monitoring will allow for a more accurate estimation of the amount of groundwater in storage, changes in storage, and over draft and groundwater conditions. The information gained from these efforts will be used in water resources decision-making for the area.

2. PROGRAM BENEFITS

Proper management and augmentation of local groundwater supplies requires a detailed understanding of conditions and trends within local groundwater basins. In conjunction with existing and planned groundwater level and quality monitoring, accurate monitoring of groundwater extraction will allow participants to understand how groundwater

Figure 1: Hemet/San Jacinto Management Area



conditions are changing and make informed decisions on how best to manage and replenish the groundwater resources.

By undertaking an extensive data-gathering effort, all parties involved in the Hemet/San Jacinto Management Area can be assured that operational yield estimates are based on the best available information. Expansion of the current monitoring effort will augment the database used in making decisions on implementation of the water management plan and contribute to the development of a successful management of the basins.

3. CURRENT ACTIVITIES

A well survey was conducted and an inventory of municipal and private wells was generated. Wells included in this inventory came from a variety of sources including the current monitoring program, municipal well lists, and wells for which Notices of Groundwater Extraction had been filed with the State. At the present time, using 2002 data, there is water level data from 188 wells, water quality data from 112 wells, and groundwater production data from 96 wells in the database. Eighty-eight wells have been identified as potential additions to the program. Figure 2 shows the well locations identified for additional investigation. A few wells have not yet been located precisely enough for inclusion on the map. This number may change since additional wells may be discovered, or new wells may be drilled, prior to the full implementation of this monitoring program.

The locations of currently identified wells are captured using Global Positioning System (GPS) technology. The GPS is a highly accurate, satellite-based, spatial positioning technology. The unit currently in use is capable of providing horizontal accuracy (x, y coordinates) within three feet. Because of the nature of the GPS satellite configuration and other considerations, the unit is not able to provide equally accurate vertical positions (z coordinate or elevation). Generally, the accuracy of the GPS-derived elevations is within ten to fifteen feet.

When the 88 wells mentioned above are physically located during site visits, their GPS position will be determined and that location will be entered into the database along with the State Well Number (or township, range, section, and quarter section) and other pertinent well-related information.

Prior to any well monitoring, permission must be obtained from the well owner. A copy of the Permission Form is attached (Attachment A). EMWD has provided over 100 copies of these permission forms for distribution and is in the process of receiving the signed permission forms from the private groundwater producers.

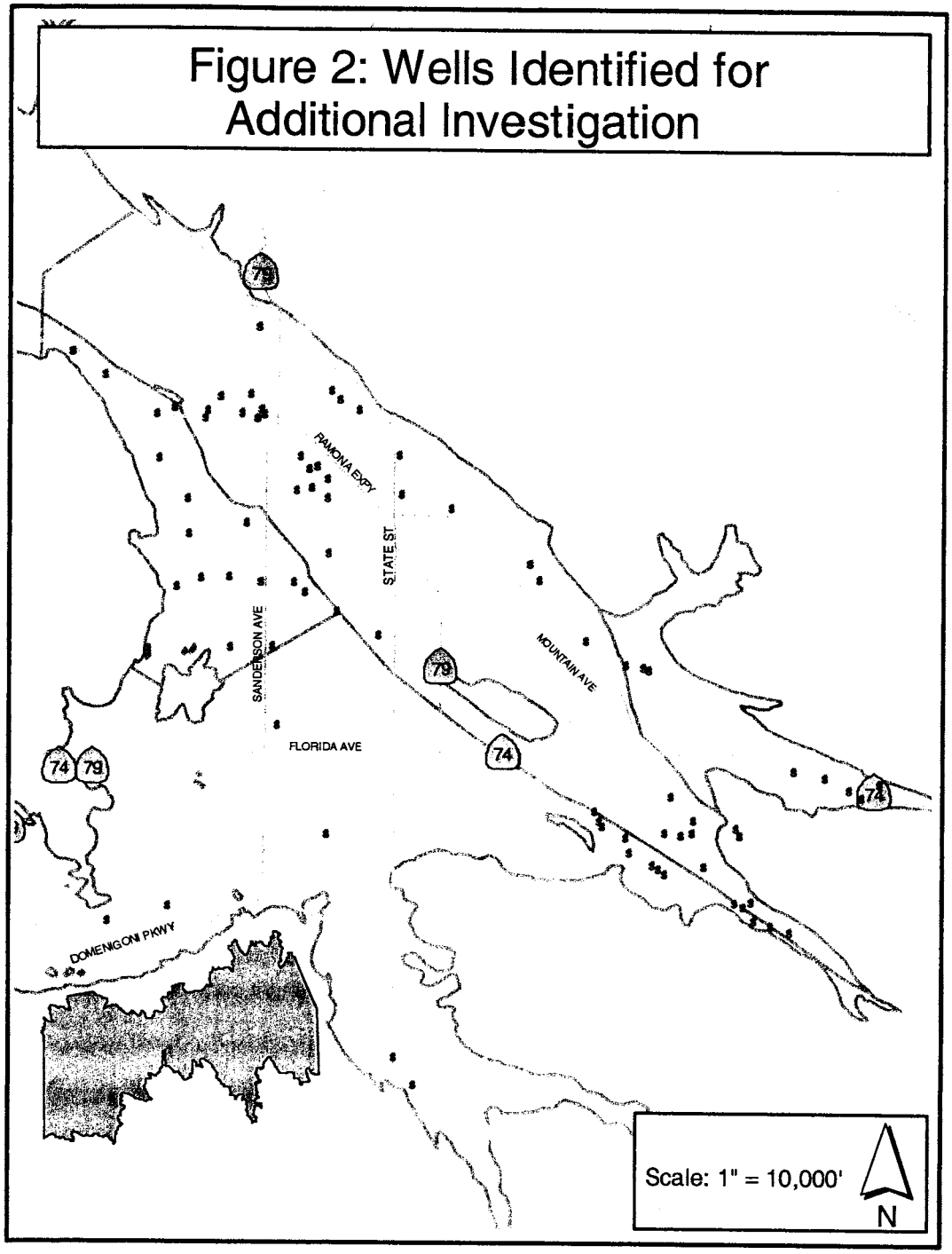


Figure 2: Wells Identified for Additional Investigation
79
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
79
FLORIDA AVE
74
74
79
74
DOMENIGONI PKWY
Scale: 1" = 10,000'
N

4. WATER LEVEL MONITORING PROGRAM

Water levels are proposed to be measured twice a year, spring and fall, to capture the high and low water levels and to determine seasonal effects on groundwater levels. The measurements will be taken prior to and following warm weather when groundwater production is high. Based on the existing information, approximately 270 wells have been identified in the Hemet/San Jacinto Management Area for water level measuring, necessitating around 540 individual measurements per year. Figure 3 shows the wells proposed for inclusion in the Water Level Monitoring Program.
General steps that are required for measuring water levels are as follows:

- A site inspection for potential hazards including open drive shafts, automatic machinery, motor operations including farm equipment, etc. is conducted
- The status of the well is confirmed, i.e., pumping or static. The well should have been in static mode (non-operational) for at least 12 hours, preferably 24 hours
- The depth to water is measured using an electric water level indicator
- The depth to water is recorded
- The recorded value is compared with previous levels for data quality control
- A final site inspection is done

5. WATER QUALITY MONITORING PROGRAM

The water quality samples are collected once a year, generally in the warmer months when the wells are running. Approximately 190 wells in the Hemet/San Jacinto Management Area have been identified for sampling. Figure 4 shows the wells proposed for inclusion in the Water Quality Monitoring Program. Constituents routinely monitored include, general minerals, metals, and total nitrogen.

The procedures for taking water quality samples differ depending on whether the well has existing pumping equipment or not. The sampling procedure is lengthier and more complicated if the well does not have an existing pump.

When the well to be sampled has a pump and is running, the sampling procedure will be follows:

- A site inspection for potential hazards including open drive shafts, automatic machinery, motor operations including farm equipment, etc. is conducted
- The status of the well (pumping or not) is confirmed. If the well is not running, it is turned on
- The sampling port on the well is located, opened, and flushed or purged. Field EC (electrical conductance) and water temperature are taken and recorded
- The water sample is taken using standard methods and proper protocol for the constituents to be sampled
- A final site inspection is done

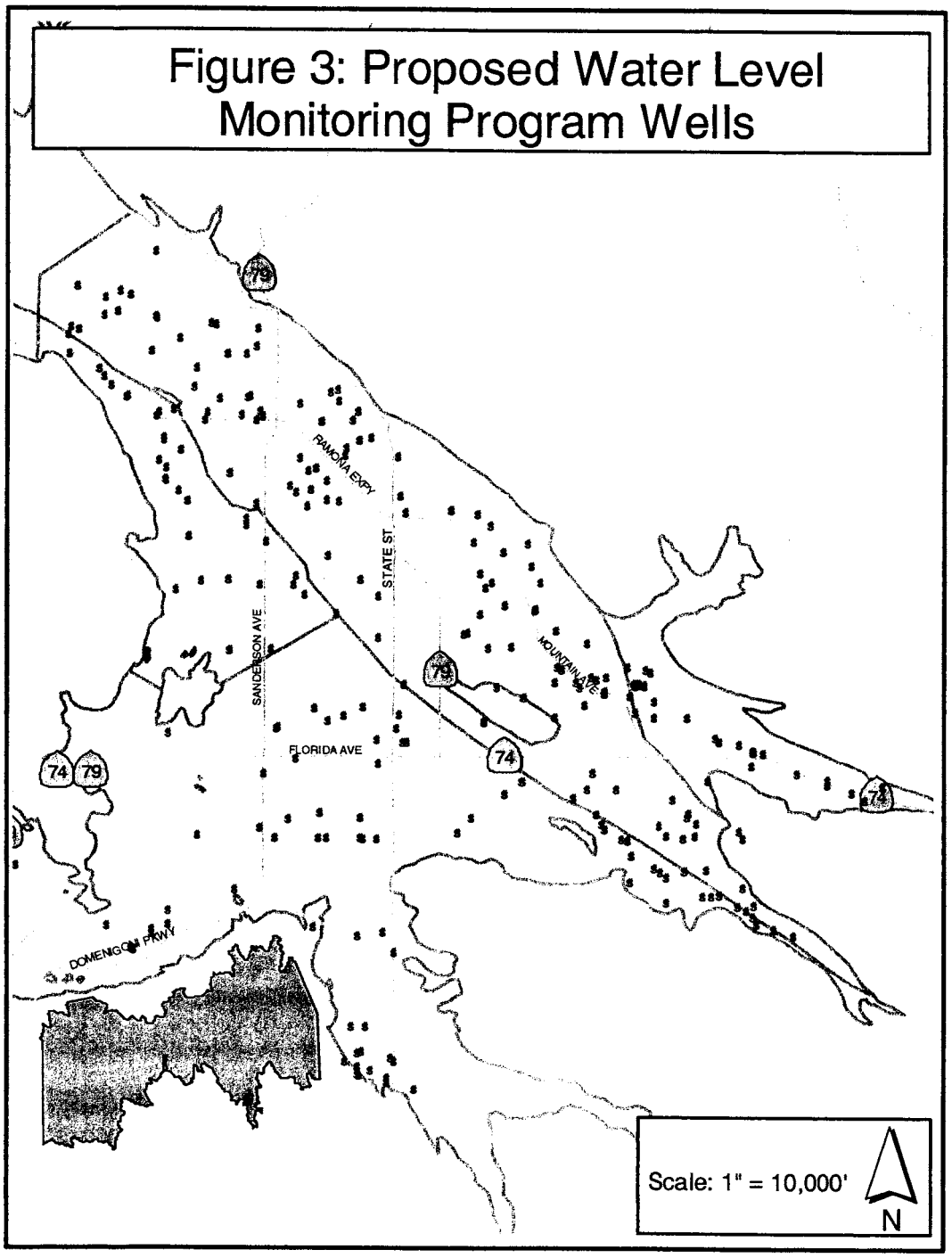


Figure 3: Proposed Water Level Monitoring Program Wells
79
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
FLORIDA AVE
74
79
DOMENIGONI PKWY
Scale: 1" = 10,000'
N

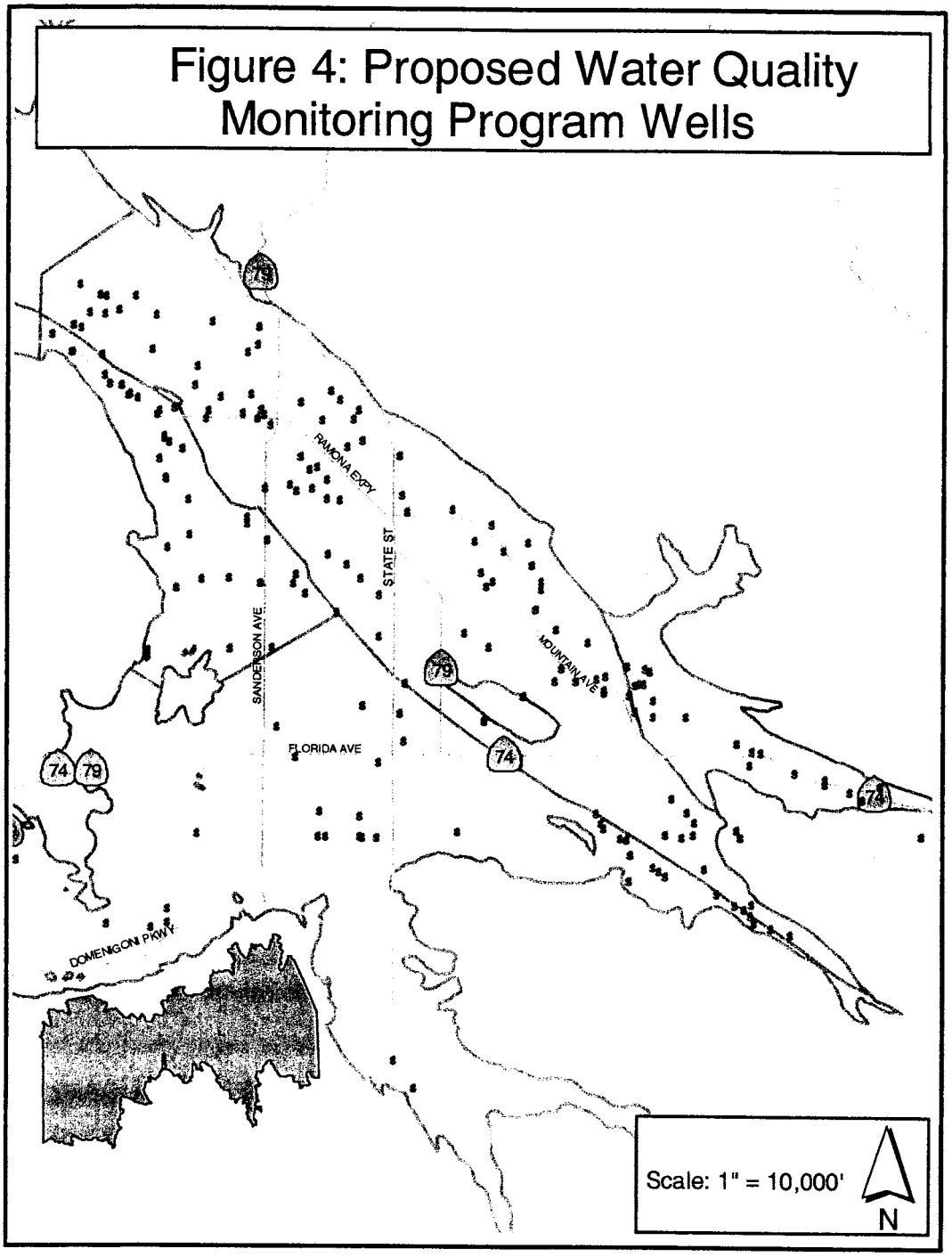


Figure 4: Proposed Water Quality Monitoring Program Wells
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
FLORIDA AVE
DOMENIGONI PKWY
79
74
Scale: 1" = 10,000'
N

When the well does not have an existing pump, a pump must be set in the well and the procedure will be as follows:

- A site inspection for potential hazards including open drive shafts, automatic machinery, motor operations including farm equipment, etc. is conducted
- The depth to water in the well is measured to determine pump setting depth
- The total existing well depth is determined by sounding the bottom of the well. This is done to prevent setting the pump in a sanded region
- The water volume in the casing is calculated to determine the length of time necessary to purge the well for a minimum of three full well volumes
- The pump is set using either continuous reel or column pipe and all electrical and discharge lines are connected
- The well is purged a minimum of three well volumes while monitoring temperature and conductivity
- Conductivity is stabilized. Conductivity is considered stabilized when five measurements taken 3-5 minutes apart are within:
  +/- 5% for conductivity <= 100 μS/cm, or
  +/- 3% for conductivity >100 μS/cm
- The water sample is taken using standard methods and proper protocol for the constituents being sampled
- Electrical and discharge lines are disconnected and the pump is pulled
- The well is closed or sealed
- A final site inspection is done

6. GROUNDWATER EXTRACTION MONITORING PROGRAM

The Groundwater Extraction Monitoring Program involves the metering of wells producing 25 or more acre-feet of groundwater per year. In conjunction with groundwater level and quality monitoring, accurate metering of groundwater extraction will allow for a better understanding of how groundwater conditions are changing and will allow the Watermaster to quantify basin stresses. Groundwater extraction data will be developed from a variety of sources including:

- Meters installed and monitored by EMWD
- Existing, privately owned meters read by EMWD personnel
- Extraction estimates based on land use, i.e., acreage under cultivation and type of crop or numbers of livestock in the case of dairies. This method is used for local producers that will not be participating in the monitoring program

6.1. Initial Program Setup and Meter Installation

Implementation of the Extraction Monitoring Program requires extensive involvement and cooperation of the local private producers. The program participants must provide permission for meter installation and access to their wells. EMWD staff will work closely with the private well owners' representatives to identify and acquire necessary permissions from the existing private well owners in the area. All meter installation

activities will be scheduled at the convenience of the well owner. Installed meters shall remain the property of EMWD as a representative of the Watermaster. The procedure for meter installation by EMWD will be as follows:

- Well owner's permission (copy is attached) for meter installation is verified
- A preliminary site inspection is conducted to review piping and well configuration and determine equipment/supplies needed
- An installation design is prepared and a meeting is held with the well owner for approval/acceptance of the design
- As much as possible, off-site fabrication is done to minimize inconvenience to the owner's operation of the well
- The installation is scheduled and approved by well owner
- The meter is installed and all piping appurtenances are returned to normal operation
- A final site inspection is done

6.2. On-going Extraction Monitoring

The cost of meter maintenance and monitoring of all metered wells will be borne by the Watermaster. Meters on approximately 175 wells are proposed to be read monthly and groundwater usage will be entered into the RWRD for review and analysis. Figure 5 shows the well locations proposed for inclusion in the Extraction Monitoring Program.

As part of this program, well owners agree to provide access to EMWD staff for meter maintenance and the monthly reading of the meters. EMWD will periodically schedule meter maintenance and calibration with the well owner. Such activities will be at the well owners' convenience and will not impact agricultural operations.

Well owners wishing to maintain their own meters may do so. Upon the request of the well owner, EMWD will consider providing maintenance and calibration of privately owned meters, contingent upon the needs of the program and the availability of funding.

When installation of a meter on a well is not physically possible or when a well cannot be metered for other reasons, groundwater production from that well will be estimated using acreage, crop type, or number of animals in the case of dairies. These estimates will be compared with metered groundwater usage at sites of similar size with similar usage as a quality control/quality assurance measure.

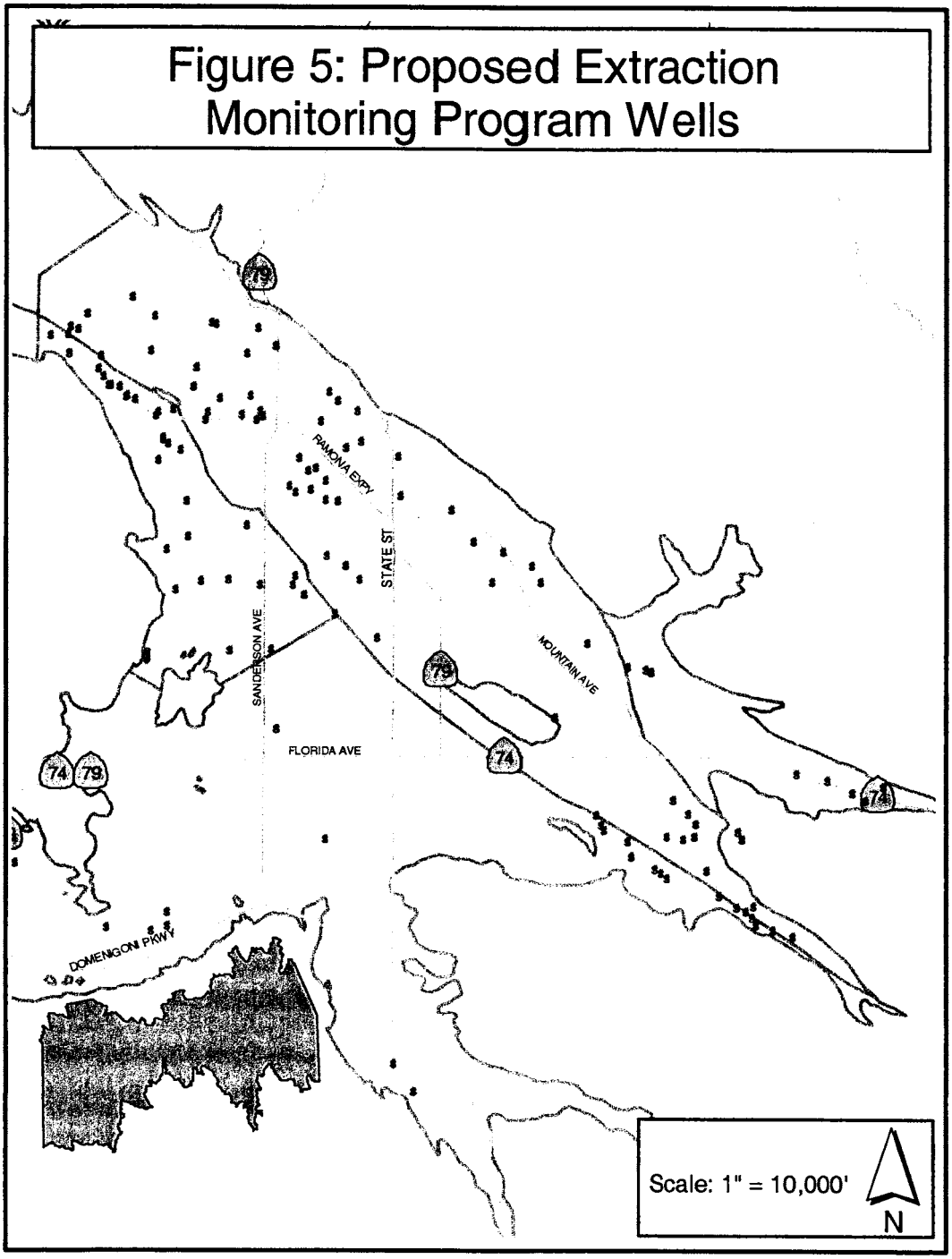


Figure 5: Proposed Extraction Monitoring Program Wells
79
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
FLORIDA AVE
74
79
74
74
DOMENIGONI PKWY
Scale: 1" = 10,000'
N

6.3. Other Sources of Extraction Data

In addition to the sources listed above, available data on groundwater extractions can also be obtained from the California Division of Water Rights compiled database on the annual reporting of groundwater extractions. However, total groundwater production in most areas is expected to be higher than the State figures because not all groundwater producers file the annual recordation notices with the State. The State has microfiche records of recordations from 1947 through 1985. From 1985 forward, the records are kept as hard copy. The quality of the State's information in electronic format for 1994 to the present is questionable and EMWD has developed its own database based on the microfiche and hard copy records and this data will be incorporated into the RWRD.

7. DATA MANAGEMENT

Combined with existing available data, the new data generated by the proposed groundwater monitoring program will be used by the Watermaster to analyze how conditions are changing in local groundwater basins. The data may be used in the following ways:

- Trend analyses of the relationship between groundwater pumping, water levels, and water quality
- Analysis of the volume of water contained in local groundwater basins and determination of the rate of natural recharge of these basins
- Preparation of mathematical models of groundwater systems for use in analyzing management alternatives
- Development of accurate water consumption figures for agricultural land use
- Protection of private water rights through the documentation of individual groundwater use
- Quantification of replenishment requirements for the following year

Data reporting by EMWD to the Watermaster includes annual reports documenting level/quality trends and extraction quantities for each groundwater basin. The annual reports will contain the results of regional analyses performed in the preceding year and a summation of any problems noted.

Private well owners will receive annual reports on their wells. These Well Owner Reports will include copies of water quality samples, water level measurements, and extraction amounts for their wells. Recordation of groundwater extraction with the Watermaster is a fundamental means of protecting private groundwater rights and all well owners are encouraged to participate.

8. INACTIVE WELL CAPPING/SEALING PROGRAM

The purpose of this program is to prevent groundwater contamination and eliminate hazards by capping/sealing inactive and/or unused wells. Open casings are especially vulnerable to contamination from surface flows or vandalism - such as the dumping of oil or other waste products. Large open casings, 16 to 18 inches in diameter, also present a

hazard to small children and animals. It is not known how many open casings or unused wells exist in the area.

During field activities EMWD staff has discovered a number of inactive wells; many covered by brush, wood, and dirt - not visible to the casual observer. Frequently, the property owner did not own the property at the time the well was drilled and was unaware of its existence. In all cases, once an old well was discovered, the property owner has been agreeable to having the casing capped.

To protect groundwater supplies, EMWD staff will use the available monitoring program funds to cap and seal an inactive well or open casing at no charge to the well owner. Priority is given to those wells that are potentially dangerous open holes (16-18" casings) or those located in areas where flooding resulting from precipitation might carry manure, fertilizers, or other contaminants into the well. These wells may still be used for water level and, in some cases, water quality monitoring.

It is anticipated that the need exists to initially cap or seal five to ten casings per year, with that number diminishing over time.

9. MONITORING PROGRAM COST ESTIMATES

The costs of the Groundwater Monitoring Program will be borne by the Administrative Assessments of the Hemet/San Jacinto Water Management Plan. However, until the Plan is implemented, it is proposed that the Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District, and Eastern Municipal Water District share these costs based on their base groundwater production percentages.

The current cost for the program set-up, meter installations, and the first year of monitoring is estimated at $180,000. Even though there are some contingencies included in these cost estimates, there is some uncertainty in the total number of wells that will be included in the actual program. Therefore, although the estimated cost is $180,000, due to uncertainty as to the actual costs for this effort, a total of $200,000 is being proposed.

It is anticipated that the Department of Water Resources (DWR) will provide $100,000 for the meter installation and first year implementation of the Monitoring Program, provided the Agencies agree to fund and implement the monitoring program into future years pursuant to this Section.

Implementation of the Extraction Monitoring Program involves an initial expenditure of funds to cover the costs of meters and meter installation. Those costs are itemized in Table 1, below.

Table 1 Meter Installation Cost Estimates	
Activity	**Estimated Cost**
Field Survey and Preparation of Specs.	$ 4,700
Permission & Installation Coordination	$ 4,800
Purchase of Meters & Related Materials	$ 50,000
Meter Installation and Calibration	$ 13,300
Vehicle/Equipment Rentals	$ 1,300
Contingencies	$ 5,900
Total	**$ 80,000**

Following installation of meters, costs will be associated with the monthly reading of meters and meter maintenance.

The annual cost of the Groundwater Monitoring Program is estimated at $100,000 and details of these cost estimates are shown in Table 2.

Table 2 On-going Monitoring Program Cost Estimates	
Activity	**Estimated Cost**
Water Level Monitoring Program	$ 12,500
Water Quality Monitoring Program	$ 38,200
Extraction Monitoring Program	$ 18,800
Inactive Well Capping/Sealing Program	$ 5,000
Documentation and Reporting	$ 14,700
Contingencies	$ 10,800
Total	**$ 100,000**

The DWR funds, as well as those funds provided by the agencies and cities, will be placed in an EMWD restricted account to be used only for the Monitoring Program costs. Any funds not used for the initial installation of meters (Table 1) or for the first year monitoring effort (Table 2) will be carried over and used for the next year's monitoring effort. Table 3 shows each agency's base production, percentage, and pro rata contribution.

Table 3 Cost Sharing Prior to Plan Implementation			
Agency	**Base Production (AF)**	**Percentage**	**Cost Contribution**
City of Hemet	6,320	19.6 %	$ 19,600
City of San Jacinto	4,031	12.5 %	$ 12,500
LHMWD.	11,063	34.2 %	$ 34,200
EMWD	10,869	33.7 %	$ 33,700
Totals	**32,283**	**100.0 %**	**$100,000**

10 ROLES AND RESPONSIBILITIES

Until the implementation of the Water Management Plan and formation of an organization to oversee the Watermaster's needs and requirements, the Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District (LHMWD), and Eastern Municipal Water District (EMWD) have agreed to work as partners toward the implementation of the Groundwater Monitoring Program outlined in pervious sections, above. The roles of each entity, including the private groundwater producers, are summarized below.

10.1 EMWD's Role

EMWD is hereby appointed as the Monitoring Program Administrator for purposes of this Agreement. EMWD shall have the following responsibilities and shall be reimbursed for time expended on behalf of the Monitoring Program at EMWD's rate of salary, plus overhead, burden, and cost of materials:

- Continue efforts to acquire the $100,000 grant from DWR
- Develop financial plan amendments in the event of DWR $100,000 grant funding problems and/or expansion of the program to include surface water monitoring
- Prepare and submit invoices for each participant based on shares identified in Table 3, above, or any other amendments agreed upon by all participants
- Provide its pro rata share of the Monitoring Program costs based on estimates outlined in Table 3, above
- Establish a restricted account for the Monitoring Program
- Manage Monitoring Program funds and provide a quarterly status report on funds and expenditures
- Identify and conduct a survey of private wells within the Hemet/San Jacinto Management Area
- Work with the private well owners' Policy Committee Representatives to secure the private well owners' permissions
- Handle all aspects of meter procurement
- Organize, facilitate, and complete meter installations on private wells participating in the monitoring program
- Continue the well capping/sealing of the private wells as a means of protecting groundwater from contamination
- Provide field, administrative, and laboratory services
- Provide vehicle and equipment rentals for the program
- Hire outside consultants and/or resources if required
- Compile the data resulting from the monitoring program and enter it into the Regional Water Resources Database
- Develop an annual report documenting the field data for the Watermaster's use
- Develop a financing plan for the future program implementing

10.2 Cities of Hemet and San Jacinto and LHMWD's Role

Acting as partners in the Monitoring Program effort, the Cities of Hemet and San Jacinto and LHMWD shall have the following responsibilities:

- Provide water level, quality and extraction data on their respective individual wells to EMWD
- Provide their pro rata share of the Monitoring Program costs based on the estimates outlined in Table 3, above
- Assist EMWD staff in communicating with private well owners in their respective jurisdictions

10.3 Private Groundwater Producers' Policy Committee Representatives' Role

As the liaison between the private producers and the agencies and Cities, the Policy Committee Representatives are the main source of communication with the private producers during the startup stages of program implementation. The groundwater monitoring program described in this document relies on the private groundwater producers' Representatives to secure the well owner's permission (copy is attached) and to provide signed permission forms to EMWD.

10.4 Groundwater Monitoring Program Participants' Role

The Cities of Hemet and San Jacinto, and Lake Hemet Municipal Water District must provide the groundwater monitoring related data to EMWD in a timely manner. The private groundwater producers participating in the program should provide access to their wells in accordance with the agreed upon permission form (see attachment A for a copy of such permission form).

ATTACHMENT A

Hemet/San Jacinto Valley Groundwater Management Plan
Groundwater Monitoring Programs
Participation/Permission Statement

1. Well Owner□s Name_____
Address:

_____

Phone Number: Day_____ Evening _____
Well Location (Description, Street Address, Riverside Co. Assessor Parcel No., etc.):

_____

_____

State Well No. (if known): _____ Well Name_____

2. **Monitoring Program: Water Level and Water Quality Sampling**

_____ I hereby give permission for field personnel from Eastern Municipal Water District (EMWD), on behalf of the Management Plan, to sample my well for **(circle one);**

WATER LEVELS **WATER QUALITY** **BOTH**

I will provide access to the well for the sampling. I wish to receive copies of the water quality testing results and request that they be sent to the address above. In the event that the pump is not turned on for water quality sampling, EMWD will re-imburse the well owner for the energy cost to operate the pump for sampling. The time of sampling will be mutually agreed upon by the Well Owner and the EMWD Field Technician who will contact the Well Owner by telephone to arrange the time of sampling.

3. **Extraction Monitoring Program**

Check one:

_____ I have a meter on my well and hereby give permission for EMWD field personnel, on behalf of the Water Management Plan, to periodically read the meter.

_____ I do not currently have a meter on my well. I hereby give EMWD, on behalf of the Water Management Plan, permission to evaluate my well for suitability for inclusion in the program and, if suitable, to install a meter on the well at their expense and to periodically read the meter. I will receive copies of

the meter read upon request. The meter shall remain the property of EMWD and I will exercise care and caution while it is on my well.

4. **Non-interference**
Sampling, measurements, and readings will be conducted so as to not interfere with the Well Owners use of the well.

5. **Hold Harmless**
EMWD hereby agrees to indemnify and hold Well Owner harmless from any and all claims for damage to property or injuries to persons arising by reason of or in any manner connected with the operations covered by this Participation/ Permission Statement that are to be performed by the District or District's contractor, personnel or equipment. Such indemnification shall include attorneys' fees and court costs.

6. **Acknowledgement**
The Well Owner recognizes that the groundwater extraction data is collected as a result of these programs will be used to establish the basin yield as part of the Water Management Plan.

_____
Signature of Well Owner

_____
Date

_____
EMWD Field Technician

_____
Date

PRINCIPLES FOR WATER MANAGEMENT

1. Water Management Plan. These Principles, approved by the appropriate authority of each party, are intended to form the basis from which the parties will develop a Water Management Plan ("Management Plan") for the area described in Section 2. The Management Plan is being developed to ensure an adequate and reliable source of future water supply. The Management Plan is also intended to facilitate and accommodate a settlement of the claims of the Soboba Band of Luiseno Indians ("Soboba Tribe").

2. Management Area. The area included in the Management Plan consists of the Canyon Sub-basin and the San Jacinto Upper Pressure Sub-basin, downstream to Bridge Street, and the Hemet Basins ("Management Area"). The Management Area is shown upon the attached map.

3. Pumpers within the Management Area. The primary pumpers within the Management Area are: Eastern Municipal Water District ("Eastern"), Lake Hemet Municipal Water District ("Lake Hemet"), City of San Jacinto ("San Jacinto"), and City of Hemet ("Hemet") (individually

"Public Agency," collectively "Public Agencies"); the Soboba Tribe (not a Management Plan participant); and approximately 62 individual agricultural and other private pumpers who pump more than 25 acre-feet per year ("Private Pumpers").

4. Goals. The parties agree that the Management Plan shall incorporate and serve to implement the following goals:

A. Allowing for Future Urban Growth. The parties acknowledge that the Management Area will continue to experience residential, commercial, and industrial growth and development, and that existing water production and service systems will need to be expanded to meet this growth. It is estimated that at least 15,000 afy incremental water supply capacity over the existing base production rights of the Public Agencies must be dedicated to adequately serve this growth. The Management Plan should serve and provide a clear planning process so that each affected Public Agency will be able to meet these projected growth needs.

B. Water Quality Protection. Implementation of the Management Plan should protect and/or enhance Management Area water quality. However, implementation of certain elements of the Management Plan may cause limited localized water quality degradation. If such degradation impedes the then current beneficial use of any Public Agency in the Management Area, the Watermaster described in Section 22 ("Watermaster") shall implement appropriate mitigation measures to ensure water supply to the affected Public Agency and bear the associated costs. The standards for local water quality degradation shall be defined in the Management Plan.

C. Cost-Effective Management. The Management Plan should serve to support the pursuit of cost-effective water supply and water treatment by the Public Agencies, both individually and collectively.

D. Overdraft. The groundwater levels within the Management Area have generally been declining for a number of years, and the Management Area is presently in a condition of overdraft. It is recognized that the Management Plan will, within a reasonable period, eliminate groundwater overdraft and enhance operational yield by

implementing a combination of available water resources management elements. These elements include: reduction in native groundwater production; enhanced recharge with native, imported and/or recycled water; development of supplemental supplies such as imported and recycled water; and water conservation programs.

E. Monitoring. The Watermaster shall implement a monitoring program to ensure the Management Plan activities follow best management and engineering principles to protect Management Area water resources.

5. Public Agencies Base Production Rights.

A. The base production rights of Eastern, Lake Hemet and Hemet in the first year of the Management Plan shall be based upon their average production for calendar years 1995-1999. This period was chosen to reflect these Public Agencies' recent pumping, and shall determine their base production rights.

B. The base production right of San Jacinto in the first year of the Management Plan, shall be based upon its average production for calendar years 1995-1999, plus 500 afy. The 500 afy is added because San Jacinto's recent production does not reflect its historic production because of water purchases and other factors.

C. Pursuant to Section 21 below, for the life of the Management Plan, Hemet and San Jacinto shall each add an additional 900 afy to their base production rights. The additional 900 afy shall not be subject to reduction by the Watermaster as provided in Section 5.D and shall not be subject to any Administrative or Replenishment Assessments as provided in Section 6, or other fee or charge imposed under the Management Plan.

D. It is the goal of the Management Plan to adjust base production rights over time to a level consistent with the Watermaster's calculation of the Public Agencies' share of safe yield for the Management Area. Based on current information, it appears that the total reduction in base production rights will need to be approximately 35%. The ultimate reduction will be based on periodic demand, hydrology, recharge and

availability of imported water. In order to implement this reduction in a phased manner, each Public Agency's base production rights shall be subject to adjustment as follows:

(1) A 10% reduction from the base production rights in the first year of the Management Plan; and

(2) Until base production rights are consistent with the Public Agencies' share of safe yield, Watermaster shall determine the reductions in base production rights in each subsequent year of the Management Plan, to achieve this goal within 6 years of approval of the Management Plan. Each reduction shall not be more than 10% of the base production right of the prior year.

(3) Pursuant to Section 7(A)(2)(b), upon conversion of a Class B Participant's land from agricultural to a use that requires water service from a Public Agency, the Public Agency shall receive an increase in its base production rights equal to the adjusted base production right of the Class B Participant.

6. Public Agency Production Assessments. The Public Agency production will be subject to the following assessments:

A. An Administrative Assessment on each acre-foot pumped by a Public Agency up to its adjusted base production right. The parties contemplate that the Administrative Assessment will be $50.00 per acre-foot of water pumped in the first year of the Management Plan, and that such amount will thereafter be set by the Watermaster.

B. A Replenishment Assessment on each acre-foot pumped by a Public Agency in excess of its adjusted base production right equal to the cost of providing a like quantity of supplemental water to recharge the Management Area, including recharge losses. Pumping by a Public Agency in excess of its adjusted base production right in order to meet increasing demands is expected and permissible, provided that such excess extractions shall be subject to the Replenishment Assessment. The costs of providing a like quantity of supplemental water shall include the costs of water, O&M costs of the replenishment system, capital recovery and other administrative costs. Currently, the total of these cost items is estimated to be in the range

of $300 to $400 per acre-feet; the actual amount will reflect the costs at the time incurred.

7. Private Pumpers Water Rights. The Public Agencies recognize the overlying water rights of the Private Pumpers, and do not intend to take or adversely impact these rights without an agreement with the owner of such rights. The Management Plan will lay out alternatives for the retention, protection, or transfer of such rights, leaving selection of the alternative to the individual overlying water rights owner. A Private Pumper can elect not to participate in the Management Plan and not to formally acknowledge its existence. Such Pumpers shall be referred to herein as "Non-Participants"; such Pumpers shall continue to exercise whatever water rights they may hold under California law unaffected by the Management Plan. There is no intent to affect water use that is consistent with the historical use of the Private Pumpers. However, other pumpers under the Management Plan do not waive their rights to challenge new or expanded water rights. Non-Participants will not have the option of joining the program at a later date. The alternatives available to participants are as follows:

A. (1) Class A Participation. A Private Pumper can elect to sign a written agreement acknowledging the existence of the Management Plan. Such Pumper shall be a Class A Participant and shall be entitled to vote for and/or be elected to serve as the Private Pumper representative on the Management Plan's governing board or body described in Paragraph 22 below, but shall not otherwise be required to participate in the Management Plan implementation. A Class A Participant may, without any financial assessment by the Watermaster, pump from his/her/its property within the Management Area the amount of water that can be put to reasonable and beneficial use on the Pumper's land as may be authorized under California law. Class A Participants shall have the right to convert to Class B Participation during a grace period that shall end three (3) years after the effective date of the Management Plan, as approved by a judgment of the Superior Court for Riverside County, upon payment of the total assessments the Pumper would have paid had the Pumper elected to be a member of Class B from the outset, plus interest.

(2) Class B Participation. A Private Pumper can become a Class B Participant by electing to limit annual pumping to the Pumper's average annual production during the calendar years 1995 through

1999 and to pay replenishment assessments on amounts in excess of that average annual production. A Class B Participant shall enjoy the following benefits of Plan Participation:

a. Vote for and/or be elected to serve as the Private Pumper's representative on the Management Plan's Governing Board;

b. Upon conversion of Pumper's land from agricultural use to a use that requires water service from a participating Public Agency, Public Agency shall credit to the extent legally permissible, Pumper or Pumper's successor-in-interest's adjusted production right, using the formula in Section 5 towards satisfaction of any requirement then in effect for water supply assessment requirements. Furthermore, Pumper or Pumper's successor-in-interest shall be given a credit for Pumper's adjusted production right using the formula in Section 5 towards any fees associated with water supply that the Public Agency may then have in effect. The Public Agency serving the converted land shall receive a credit to its production right as set forth in Section 5.

c. To the extent the Pumper's land is not covered under Section 7(A)(2)(b), Pumper will be eligible to enter into a contract with the Management Plan, or a participating Public Agency, to sell for a defined period of time some portion of Pumper's adjusted production right, under terms and conditions mutually agreed upon by the Pumper and the Management Plan. Criteria used in consideration of such contract shall include:

(i) Management Plan's need to acquire additional water supplies to address Basin overdraft and recovery;

(ii) Submission of a water conservation plan, including use of in lieu water, by Pumper that will reasonably guarantee conservation of water that would otherwise be produced from the Basin;

(iii) Public policy considerations of local government jurisdictions, including economic and land use impacts of proposed water conservation plan.

B. In-Lieu Water Use. In the event a Private Pumper (or successor) receives recycled and/or imported water from a Public Agency to serve an overlying use in place of groundwater, or otherwise engages in an in-lieu program, the overlying water right of the Private Pumper (or successor) shall not be diminished by the receipt and use of such recycled and/or imported water or by engaging in an in-lieu program.

C. Well Monitoring. To become a Class A or B Participant, a Private Pumper shall authorize the metering of the Pumper's well(s) and the collection of groundwater level and quality data, and the reading thereof by Management Plan personnel. The metering and reading shall be at no cost to the Pumper, and the Pumper shall receive copies of the reports and information obtained upon request.

D. Future Production Participation. Any new Pumper after the effective date of the Management Plan, as approved by a judgment of the Superior Court for Riverside County, can only participate as a Class A Participant as described in Section 7A(1).

E. Replacement Wells. The redrilling of existing wells and the drilling of new wells to replace existing wells will not be considered new private production.

8. Capital Facilities. Each Public Agency shall continue to own its existing capital facilities for water management. However, capital facilities may be jointly constructed and owned by the Management Plan. Joint financing of such facilities may be funded by regional capital fees, loans and grants, contributions for storage by The Metropolitan Water District of Southern California ("Metropolitan") or other third-parties, and municipal bonds. Responsibility for the costs of any existing and future capital facility of the Management Plan should be apportioned among the Public Agencies based on relative benefit to be derived by each Public Agency. Any of the participating Public Agencies may propose projects to be included in the Management Plan to increase Management Area water supply. Such proposals, after evaluation by the Watermaster, shall be included or rejected. If the Watermaster chooses to reject the proposal, the proposing Public Agency may implement the rejected project as long as it does not significantly impact the implementation of the Management Plan and/or interfere with the ongoing production by the Public Agencies.

9. Soboba Tribe's Water Rights. The Soboba Tribe's water rights shall be determined as part of a settlement among the Soboba Tribe, the United States, Eastern, Lake Hemet and Metropolitan. Major points of the proposed settlement are:

A. The Soboba Tribe shall have a senior, prior right in the Canyon and San Jacinto Upper Pressure Sub-basins of 9000 afy, but its use shall be limited to a maximum of 4100 afy during the first 50 years after the effective date of the settlement.

B. The Soboba Tribe shall have the right to purchase replenishment water for use pursuant to the Principles of Settlement at the Management Plan replenishment rate.

C. The Soboba settlement provides that, among other things, Metropolitan will use its best efforts to deliver sufficient water to yield a 15-year average of 7,500 afy to the Management Plan until 2035 at its long-term interruptible rate (currently $233/af).

D. Subject to full funding of the settlement by the United States, the Management Plan shall pay the Soboba Tribe $10 million.

E. The Management Plan will also pay the Soboba Tribe $7 million. A Public Agency's payment of its share of this amount is optional, but in order to obtain the benefits of the low-cost Metropolitan water delivered pursuant to the settlement, a Public Agency shall pay its share of this amount.

F. The Management Plan will receive $10 million for capital improvements from the United States, and all unused Soboba Tribe water based on the Public Agency's participation in the payment in Section 9(E) above.

10. Implementation of These Principles. These Interim Principles for Water Management shall be used by the parties as a basis for the preparation of the Management Plan, and a stipulated judgment in a water rights adjudication. As explained below, the Management Plan shall be administered by the Watermaster. The Watermaster will be under the continuing jurisdiction of the Court.

11. Assessment Program. The assessment program contemplated by the Management Plan shall be administered by the Watermaster subject to the governance provisions herein. All payments shall be made to the Watermaster and shall be maintained in a separate restricted fund. All assessments shall be used exclusively to acquire imported, recycled or Metropolitan water for the recharge of the Management Area, and for the facilities and operational and administrative expenses associated with the assessment and recharge programs. Subject to Management Plan approval, assessments may also be used by affected parties to acquire and deliver water for direct use by the parties, in lieu of pumping.

12. Replenishment Program. The replenishment program contemplated by the Management Plan shall also be administered by the Watermaster. The program shall include: the acquisition of supplemental water supplies (including imported, recycled and Soboba Tribe water); the expenditure of assessments; the recharge of the Management Area; and the construction and operation of all necessary facilities, including but not limited to, development of surface and sub-surface percolation and injection facilities. Priority for replenishment will be based on an equitable

apportionment of available replenishment water among the sub-basins after full consideration of: the Public Agency's participation in the payment in Section 9(E) above; the Management Area conditions; water demands; the availability of storage capacity to accommodate the recharge of natural flows; the availability of appropriate conveyance facilities; and the availability of replenishment or imported water. The Watermaster is encouraged to take advantage of surplus imported water that occasionally may be available at low cost, and to use available assessment funds to bank such recharge against future pumping in excess of adjusted production rights.

13. Rights to Groundwater. Groundwater in the Management Area may occur from: natural recharge; spreading operations of natural flows; replenishment with imported, recycled or Metropolitan water acquired with assessment funds; or in-lieu recharge programs financed with assessment funds. All such groundwater shall be available to support the pumping of the parties as allowed herein, and shall not be the property of any individual party, subject to the provisions of Section 14.

14. Storage Rights. The parties recognize that unused storage capacity exists in the Management Area, and the Management Plan contemplates that this capacity will be managed conjunctively with available imported and recycled water supplies. Subject to availability of the Management Plan fund for assessments and unused storage capacity as determined by Watermaster, the Management Area will be recharged and water stored therein when such supplies are available, and drawn upon by the Public Agencies in dry years when such supplemental water supplies may not be available. In addition, unused storage capacity as determined by Watermaster may be used for "put and take" operations of recycled or imported water that is paid for by any party to the Management Plan provided that:

A. Such operations do not interfere with the rights of any other pumper, or with the use of the storage capacity for recharge and storage under the Management Plan;

B. Water available for recharge is purchased first, as needed, for the Management Plan;

C. Later recovery of stored water shall exclude losses; and

D. Such recovered water may be used anywhere within the service area of the party.

Any conjunctive use programs for the benefit of territory outside of the Management Area shall be subject to the governance provisions herein. Any storage, conjunctive use programs by third parties or in-lieu recharge programs financed with assessment funds shall be subject to the governance provisions herein.

15. Spreading Operations. The Public Agencies shall independently or jointly operate their respective facilities to maximize the existing spreading and recharge operations of natural flow in the Management Area.

16. Recharge Water Quality. Consistent with Section 4(E) above all water used to replenish any sub-basin in the Management Area shall meet the Regional Water Quality Control Board requirements, and may be used in any sub-basin where such requirements are met.

17. Recharge Losses. The accounting for storage recharge of the Management Area shall not include any water that escapes therefrom and migrates downstream beyond the Management Area. Losses will be calculated based upon best engineering principles.

18. Recycled Water. The use of recycled water can be of substantial benefit in providing additional water in the Management Area. Each Public Agency may implement a recycled water program, including the ownership, operation and construction of all necessary facilities, and the application for and administration of any loan or grant applications. The Management Plan will support loan or grant applications, and the Public Agencies will work to integrate recycled water into the Management Plan to the extent economically feasible while meeting regulatory standards. Subject to existing recycled water contracts, the Management Plan will have a first right of refusal to purchase excess recycled water for recharge. Priority shall be given to Management Area recharge for the use of recycled water which originates therefrom.

19. Export. The Public Agencies may export water outside the Management Area, on a temporary basis, upon approval by the Watermaster.

However, any water exported shall be replenished with an appropriate amount of similar or better quality water as determined by Watermaster. Also, water exports by the Public Agencies shall not interfere with the Management Plan or any other Public Agency's operations. The Management Plan will set forth the specific criteria for the export of water, including, but not limited to, conjunctive use programs.

20. Credits. Recharge credits documented before the Management Plan shall be calculated pursuant to the Management Plan. Future recharge credits shall be established by replenishment of water or by not exercising the full, adjusted base production right, and shall be calculated pursuant to the Management Plan.

21. Tunnel Seepage, Stream Diversions, Fruitvale To resolve Eastern's use of Tunnel seepage, Lake Hemet's stream diversions and Eastern's use of Fruitvale water, 900 afy shall be added to Hemet's adjusted base production and 900 afy shall be added to San Jacinto's adjusted base production right as discussed in Section 5 above. This is intended to provide Hemet and San Jacinto a fair share of water from these disputed issues.

22. Governance. The Management Plan will be administered by a Watermaster as follows:

A. The governing board of the Watermaster shall consist of one elected official from each of the Public Agencies and one Private Pumper representative selected by the Private Pumpers who participate in the Management Plan. Each member shall have one vote.

B. The Watermaster's duties shall include: determining safe yield; determining replenishment needs; determining annual adjusted base production rights; purchasing and selling imported and recycled water; constructing future capital facilities; establishing assessment rates; initiating necessary conservation and drought management measures; and implementing other responsibilities identified in the Management Plan documents.

Dated: 1/28, 2004.

EASTERN MUNICIPAL WATER DISTRICT

By: _____

Dated: FEB. 23, 2004.

LAKE HEMET MUNICIPAL WATER DISTRICT

By: _____

Dated: _____, 2004.

CITY OF HEMET

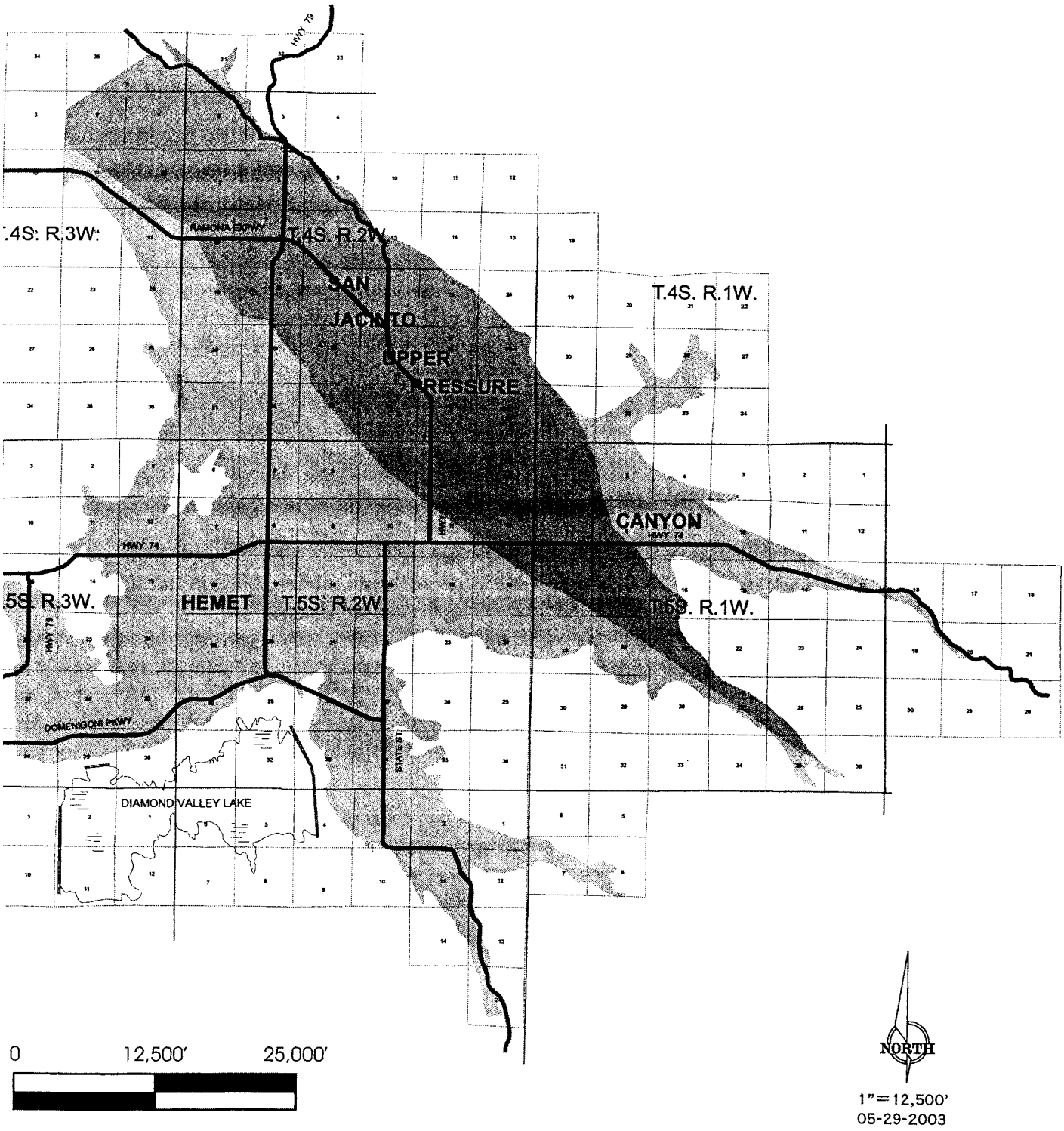
By: _____

Dated: 2-23, 2004.

CITY OF SAN JACINTO

By: _____

MANAGEMENT AREA



MEMORANDUM OF UNDERSTANDING

INTERIM WATER SUPPLY PLAN

UPPER SAN JACINTO SUB-BASINS

This Memorandum Of Understanding; Interim Water Supply Plan, Upper San Jacinto Sub-Basins ("MOU"), is hereby entered into this 1st day of April, 2004 by and between the EASTERN MUNICIPAL WATER DISTRICT, a California municipal water district ("EMWD"), LAKE HEMET MUNICIPAL WATER DISTRICT, a California municipal water district ("LHMWD"), CITY OF HEMET, a California general law city ("Hemet"), and CITY OF SAN JACINTO, a California general law city ("San Jacinto"), (collectively referred to hereinafter as the "Parties"), based on the following facts:

RECITALS

A. The Parties have entered into that "Memorandum of Understanding to Work Cooperatively to Promote Conjunctive Use Projects and Programs in Upper San Jacinto River Basins" dated June 19, 2001 (the "Conjunctive Use MOU"). The purpose of the Conjunctive Use MOU is to encourage cooperation among the Parties to facilitate and support local groundwater management efforts and conjunctive use programs particularly those that could increase dry-year water supplies, within the safe-yield and without the overdraft of San Jacinto groundwater basins.

B. The Parties have also entered into that "Agreement to Develop a Groundwater Monitoring Program in the Hemet/San Jacinto Management Area" dated _____ 2003 ("GWM Program"). The purpose of the GWM Program is to measure and monitor groundwater levels to assist in the accurate evaluation of conditions of overdraft and the evaluation of operational safe yield in the Hemet/San Jacinto Management Area.

C. Furthermore, in February of 2004, the Parties each approved a statement of principles entitled "Principles for Water Management" (the "PWM") with regard to the Hemet and San Jacinto Basins. The PWM establishes the framework from which the Parties will develop a Water Management Plan for the Hemet and San Jacinto Basins.

D. The Conjunctive Use MOU and the PWM recognize that the Parties, individually and collectively, have an interest in managing and preserving the ground and surface water resources within the Hemet and San Jacinto Basins in order to alleviate an escalating condition of overdraft within those Basins.

E. Through the ongoing GWM Program conducted by the Parties, it has been discovered that well levels within certain portions of the Canyon and Intake sub-areas of the San Jacinto Basin ("Upper San Jacinto Sub-Basins") have declined more than the Parties had originally projected. This fact suggests that the condition of overdraft in the Upper San Jacinto Sub-Basins may be deteriorating more rapidly than anticipated,

making a collective effort to address the situation prudent prior to establishment of the Water Management Plan.

F. Therefore, in furtherance of the goals stated in the Conjunctive Use MOU and the PWM, it is the purpose and intent of the Parties in entering into this MOU to provisionally address the deteriorating situation by providing interim stabilization of the Upper San Jacinto Sub-Basins through the application of approximately 6,000 acre feet of direct and indirect groundwater recharge during calendar year 2004. To implement this goal, the Parties pledge to undertake the following actions during the calendar year 2004.

OPERATIVE PROVISIONS

NOW, THEREFORE, in consideration of the promises made and recited herein, the Parties do hereby enter into this Memorandum of Understanding setting forth their pledges, commitments, understandings and appropriate limiting conditions, as follows:

ARTICLE 1.0 - EMWD's PLEDGES AND CONDITIONS

1.1 **Pledges by EMWD**. Subject to the conditions set forth in Section 1.2, EMWD pledges the following:

1.1.1 Purchase and Recharge of Water. EMWD will contribute up to Eight Hundred Eighty Three Thousand Dollars and No Cents ($883,000.00) for the acquisition, transportation, operations, and recharge of imported water into the Upper San Jacinto Sub-Basins. EMWD will coordinate and cooperate with LHMWD and MWD regarding the acquisition of imported water. EMWD understands and agrees that it will implement the transportation and recharge of the purchased imported water into the Upper San Jacinto Sub-Basins using its existing conveyance and spreading facilities within the Management Area.

1.1.2 Restriction on Conveyances and Exports. EMWD will use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area during July, August, and September 2004, and will eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge, or made available due to groundwater recharge, in the Upper San Jacinto Sub-Basins during the 2004 calendar year. In addition, EMWD will pursue construction of Reach 16 to deliver recycled water to the Heartland Area and will investigate water supply contingency plans.

1.2 **EMWD's Conditions**. The pledges of EMWD stated in Section 1.1 are subject to the following conditions:

1.2.1 Optimizing Capacity. That the Parties cooperate with EMWD's efforts to optimize its delivery capacity during the months of July, August, and September 2004, by refraining, to the extent feasible, from exercising their rights to

delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD ("Fruitvale Agreements"). It is understood and agreed that any Party's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of their contract rights under the Fruitvale Agreements or such other rights as the Party may have to purchase and receive Fruitvale Water.

1.2.2 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 2.1, 3.2, and 4.2.

1.3 **Acceptance of Other Parties' Conditions**. EMWD hereby accepts each other Party's conditions on their respective pledges.

1.4 **Cooperation with Other Parties**. EMWD agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 2.0 - LHMWD'S PLEDGES AND CONDITIONS

2.1 **Pledges by LHMWD**. Subject to the conditions set forth in Section 2.2, LHMWD pledges the following:

2.1.1 Purchase and Recharge of Water. LHMWD will contribute up to Eight Hundred Twenty-eight Thousand Dollars and No Cents ($828,000.00) for the acquisition, transportation, operations, and recharge of imported water into the Upper San Jacinto Sub-Basins. LHMWD will coordinate and cooperate with EMWD and MWD regarding the acquisition of imported water. LHMWD understands and agrees that EMWD will implement the transportation and recharge of the purchased imported water into the Upper San Jacinto Sub-Basins using its existing conveyance and spreading facilities within the Management Area.

2.1.2 Optimizing Capacity. LHMWD will cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2004, by refraining during such months, to the extent feasible, from exercising their rights to delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD. It is understood and agreed that LHMWD's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of LHMWD's contract rights under the Fruitvale Agreements or such other rights as LHMWD may have to purchase and receive Fruitvale Water.

2.2 **LHMWD's Conditions**. The pledges of LHMWD stated in Section 2.1 are subject to the following conditions:

2.2.1 Emergency Production of Water. In the event LHMWD experiences an emergency loss of water production capacity or is otherwise unable to satisfy its municipal demand through the use of its own facilities, as determined by the LHMWD, LHMWD reserves the right to exercise its rights to delivery of Fruitvale Water during the months of July, August and September 2004 and shall pay EMWD the standard rate for Fruitvale Water, for amounts delivered within LHMWD's entitlement. For amounts required by LHMWD and delivered by EMWD over the entitlement amount, LHMWD shall pay EMWD's then current wholesale water rates.

2.2.2 Restriction on Conveyance Water and Exports. That EMWD use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area during July, August, and September 2004, and to eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge, or made available due to groundwater recharge, in the Upper San Jacinto Sub-Basins during the 2004 calendar year.

2.2.3 Preservation of Fruitvale Water Rights. Notwithstanding LHMWD's pledge to not exercise its entitlements to purchase and receive Fruitvale Water during July, August and September 2004, such pledge and non-exercise shall not be construed by the Parties or any of them as a waiver, failure to exercise, or other abrogation of LHMWD's rights under the Fruitvale Agreements or Fruitvale Adjudication and such rights shall be preserved, survive without diminishment, and remain valid and in full force and effect.

2.2.4 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 1.1, 3.2, and 4.2.

2.3 **Acceptance of Other Parties' Conditions**. LHMWD hereby accepts each other Party's conditions on their respective pledges.

2.4 **Cooperation with Other Parties**. LHMWD agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 3.0 - HEMET'S PLEDGES AND CONDITIONS

3.1 **Acknowledgement of Conditions**. Hemet acknowledges the need of the Parties to cooperatively minimize the impacts on water resources in the Upper San Jacinto Sub-Basins. The Parties acknowledge that groundwater resources and well levels surrounding Hemet's water production facilities in the Hemet Basin have not experienced the same rate of decline, as have facilities of the Parties in the San Jacinto Basin. The Parties further acknowledge that Hemet's temporary reallocation of production from the Upper San Jacinto Sub-Basins to the Hemet Basin, as stated in

Section 3.2.1 [Reallocation of Water Production], is provided by Hemet as a means of cooperating with, and providing benefit to, the other Parties to address the conditions in the Upper San Jacinto Sub-Basins. The Parties also acknowledge that Hemet's temporary reallocation of production will not adversely impact the rights, interests, or facilities of the other Parties, and will not unreasonable contribute to the overdraft of the Hemet Basin.

3.2 **Pledges by Hemet**. Subject to the conditions set forth in Section 3.3, Hemet pledges the following:

3.2.1 Reallocation of Water Production. Hemet will reduce its water production and/or receipt from the Upper San Jacinto Sub-Basins during calendar year 2004 by a total of 1072 acre feet. The reduction will be accomplished by: (i) reducing groundwater production from Hemet wells No. 6 and No. 9, by approximately 300 acre feet over the 2004 calendar year; and (ii) by foregoing the exercise of its right to receive deliveries of Entitlement Water or Excess Water ("Fruitvale Water") – currently 772 acre feet -- under EMWD's Improvement District No. 24 program as provided in that Agreement between Hemet and EMWD dated June 13, 1972 ("Fruitvale Agreement") during calendar year 2004. Hemet will off-set this decrease in water production and/or receipt with an increase in groundwater production from Hemet's new or existing facilities in the Hemet Basin.

3.2.2 Optimizing Capacity. Hemet will cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2004, by refraining during such months, to the extent feasible, from exercising its rights to delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD ("Fruitvale Agreements"). It is understood and agreed that Hemet's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of Hemet's contract rights under the Fruitvale Agreements or such other rights as Hemet may have to purchase and receive Fruitvale Water.

3.3 **Hemet's Conditions**. The pledge's of Hemet stated in Section 3.2 are subject to the following conditions:

3.3.1 Emergency Production of Water. In the event Hemet experiences an emergency loss of water production capacity, or is otherwise unable to satisfy its municipal demand from its own facilities, as determined by the Hemet Water District, Hemet shall be entitled to increase water production from Hemet Well No. 6 and No. 9, or receive Fruitvale Water during the duration of the emergency. Hemet's pledge to reallocate water production as provided in Section 3.2 shall be reduced by the same amount. However, Hemet shall contribute an amount of funds equal to the acre feet of water produced multiplied by EMWD's then current wholesale water rate for the acquisition of replacement water.

3.3.2 Preservation of Water Lease Obligations. Hemet has an obligation to produce one hundred (100) acre feet of water per year each from Well No. 6 and Well No. 9. Notwithstanding anything to the contrary in Section 3.2, Hemet shall be entitled to produce such amounts from these wells. Hemet anticipates that it will be able to meet both its pledged reduction and its lease obligations.

3.3.3 Preservation of Fruitvale Water Rights. Notwithstanding Hemet's pledge to not exercise its entitlements to purchase and receive Fruitvale Water during calendar year 2004, such pledge and non-exercise shall not be construed by the Parties or any of them as a waiver, failure to exercise, or other abrogation of Hemet's rights under the Fruitvale Agreements or Fruitvale Adjudication and such rights shall be preserved, survive without diminishment, and remain valid and in full force and effect.

3.3.4 Restriction on Conveyance Water and Exports. That EMWD use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area and to eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge in the Upper San Jacinto Sub-Basins during the 2004 calendar year.

3.3.5 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 1.1, 2.1, and 4.2.

3.4 **Acceptance of Other Parties' Conditions**. Hemet hereby accepts each other Party's conditions on their respective pledges.

3.5 **Cooperation with Other Parties**. Hemet agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 4.0 - SAN JACINTO'S PLEDGES AND CONDITIONS

4.1 **Acknowledgement of Conditions**. San Jacinto acknowledges the need of the Parties to cooperatively minimize the impacts on water resources in the Upper San Jacinto Sub-Basins.

4.2 **Pledges by San Jacinto**. Subject to the conditions set forth in Section 4.3, San Jacinto pledges the following:

4.2.1 Pledge of Future Credits. San Jacinto pledges 243 acre feet (the current equivalent of $78,260 at the import water rate of $322) of future recharge credits that are anticipated to accrue to San Jacinto pursuant to Section 20 of the Principles For Water Management. San Jacinto's recharge credits will be reduced by 243 acre feet once accrued. Another Party may purchase these credits from the

Watermaster for $78,260, which amount will then be applied to the 2004 interim recharge program.

4.2.2 Optimizing Capacity. San Jacinto will make a good faith effort to cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2004, by refraining, to the extent feasible in its sole discretion, from exercising its rights to delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD ("Fruitvale Agreements"). It is understood and agreed that San Jacinto's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of San Jacinto's contract rights under the Fruitvale Agreements or such other rights as San Jacinto may have to purchase and receive Fruitvale Water.

4.3 **San Jacinto's Conditions**. San Jacinto's pledges as stated in Section 4.2 are subject to the following conditions:

4.3.1 Emergency Production of Water. In the event San Jacinto experiences an emergency loss of water production capacity or is otherwise unable to satisfy its municipal demand through the use of its own facilities, as determined by the San Jacinto, San Jacinto reserves the right to exercise its rights to delivery of Fruitvale Water during the months of July, August and September 2004 and shall pay EMWD the standard rate for Fruitvale Water, for amounts delivered within San Jacinto's entitlement. For amounts required by San Jacinto and delivered by EMWD over the entitlement amount, San Jacinto shall pay EMWD's then current wholesale water rates.

4.3.2 Preservation of Fruitvale Rights. Notwithstanding San Jacinto's pledge to not otherwise exercise its entitlements to purchase and receive Fruitvale Water during July, August and September 2004, such pledge and non-exercise shall not be construed by the Parties or any of them as a waiver, failure to exercise, or other abrogation of San Jacinto's rights under the Fruitvale Agreement or Fruitvale Adjudication and such rights shall be preserved, survive without diminishment, and remain valid and in full force and effect.

4.3.3 Restriction on Conveyances and Exports. That EMWD use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area and will eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge in the Upper San Jacinto Sub-Basins during the 2004 calendar year.

4.3.4 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 1.1, 2.1, and 3.2.

4.4 **Acceptance of Other Parties' Conditions**. San Jacinto hereby accepts each other Party's conditions on their respective pledges.

4.5 **Cooperation with Other Parties**. San Jacinto agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 5.0 - MISCELLANEOUS PROVISIONS

5.1 **Term**. This MOU shall terminate, unless extended by the mutual agreement of the Parties memorialized in writing, on December 31, 2004.

5.2 **Costs & Expenses**. The Parties shall bear the costs of implementing their own pledges, and shall bear their own costs and expenses otherwise participating in this MOU.

5.3 **Authority**. The individuals executing this Agreement on behalf of the Parties and the instruments referenced on behalf of the Parties represent and warrant that they have the legal power, right and actual authority to bind the Parties to the terms and conditions hereof and thereof.

5.4 **Counterpart Originals**. This Agreement may be executed in duplicate originals, each of which is deemed to be an original.

5.5 **Effective Date**. This MOU has become effective among and between the Parties on the date by which each Party's governing board or council has approved the MOU and the authorized representative of each Party has executed the MOU.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding on the date and year first above written.

EASTERN MUNICIPAL WATER DISTRICT

By: _____

Its: GENERAL MANAGER

LAKE HEMET MUNICIPAL WATER DISTRICT

By: _____

Its: GENERAL MANAGER

CITY OF HEMET

By: _____

Steve Temple, City Manager

ATTEST:

By: _____

Stephen Clayton
City Clerk

Approved as to Form:

By: _____

Eric S. Vail
Assistant City Attorney for the City of Hemet

CITY OF SAN JACINTO

By: _____

Peter A. Cosentini, City Manager

ATTEST:

_____

Dorothy L. Chouinard, City Clerk

Approved as to Form:

By: _____

City Attorney for the City of San Jacinto
Best Best & Krieger LLP

MEMORANDUM OF UNDERSTANDING

PREPARATION OF WATER MANAGEMENT PLAN FOR THE HEMET/SAN JACINTO MANAGEMENT AREA

This Memorandum Of Understanding: Preparation of Water Management Plan for the Hemet/San Jacinto Management Area ("MOU"), is hereby entered into this 17th day of June, 2004 by and between the EASTERN MUNICIPAL WATER DISTRICT, a California municipal water district ("EMWD"), LAKE HEMET MUNICIPAL WATER DISTRICT, a California municipal water district ("LHMWD"), CITY OF HEMET, a California general law city ("Hemet"), and CITY OF SAN JACINTO, a California general law city ("San Jacinto"), (collectively referred to hereinafter as the "Parties"), based on the following facts:

RECITALS

A. Groundwater in the Hemet/San Jacinto Management area has been, and will remain, a significant source of water for the people and agribusiness of Riverside County providing an invaluable contribution to the local economy and public good. As a result, the Parties have acknowledged their collective interest in the management of local water resources within the Hemet/San Jacinto Management area.

B. In furtherance of this collective interest, the Parties entered into that "Memorandum of Understanding to Work Cooperatively to Promote Conjunctive Use Projects and Programs in Upper San Jacinto River Basins" dated June 19, 2001 (the "Conjunctive Use MOU"). The purpose of the Conjunctive Use MOU is to encourage cooperation among the Parties to facilitate and support local groundwater management efforts and conjunctive use programs particularly those that could increase dry-year water supplies, within the safe-yield and without the overdraft of San Jacinto groundwater basins.

C. In the cooperative spirit of the Conjunctive MOU and with assistance from the State Department of Water Resources, the parties engaged in several rounds of policy discussions and technical investigations into suitable methods to alleviate the overdraft, manage long term water supplies, and provide for demands of growth. As the result of these efforts, the Parties each approved a statement of principles entitled "Principles for Water Management" (the "Principles") in February 2004 with regard to the Hemet and San Jacinto Basins. The Principles established the framework from which the Parties agreed to develop a Water Management Plan for the Hemet and San Jacinto Basins.

D. The intent of this MOU is to provide for the creation of the Water Management Plan ("WMP") called for in the Principles, to appoint Eastern Municipal Water District as the Contract Administrator for preparation of the WMP, and to establish an equitable mechanism for funding the WMP by the Parties.

OPERATIVE PROVISIONS

NOW, THEREFORE, in consideration of the promises made and recited herein, the Parties do hereby enter into this Memorandum of Understanding setting forth their pledges, commitments, understandings and appropriate limiting conditions, as follows:

ARTICLE 1.0 AGREEMENT TO UNDERTAKE WMP

1.1 **Cooperation**. The Parties agree that the WMP shall be timely undertaken and completed in accordance with this MOU. In order to ensure the timely and efficient completion of the WMP within the budget described in this MOU, the Parties agree to cooperate with and amongst each other, to share information necessary for the preparation of the WMP, and to take such other reasonable actions as may be necessary for the timely completion of the WMP, provided such actions do not result in additional costs to the Parties.

1.2. **Scope of Work**. The WMP shall be prepared in accordance with the Scope of Work attached hereto and incorporated herein by reference as Attachment 1 (hereinafter referred to as the "Scope of Work"). The Scope of Work defines the extent of the WMP, the tasks necessary for its completion, assigns responsibility for those tasks, and outlines the basic content of each constituent section.

1.3. **Consultant**. The Parties agree that the WMP shall be prepared by an independent contractor, except for those sections which the Scope of Work designates will be prepared by EMWD or the Parties collectively. The Parties agree that Water Resources & Information Management Engineering, Inc, (hereinafter "WRIME") is hereby selected to be the independent contractor principally responsible for undertaking and completing the Scope of Work. However, it is contemplated that WRIME will subcontract with, or EMWD will enter into separate contracts with, GEOSCIENCE, Support Services, Inc., and Stetson Engineering (hereinafter collectively referred to as "Subconsultants") for certain work identified in the Scope of Work. Subconsultants shall serve as consultants for WRIME with regard to performance of the Scope of Work and shall not serve as consultants for Hemet or San Jacinto or their attorneys for performance of the Scope of Work.

1.4. **Project Cost**. The Parties agree that the amount to be paid to WRIME and Subconsultants for undertaking and completing the Scope of Work shall not exceed that amounts reflected on the WMP Budget attached hereto and incorporated herein by reference as Attachment 2. The WMP Budget reflects a total, not to exceed, project cost of $180,894 ("Total Project Cost"). The Parties agree that the approximately $16,869 remaining in the budget for the Hemet/San Jacinto Groundwater Association ("GWA") and the approximately $20,000 remaining in the budget for the Integrated Water Management Plan ("IWMP") shall be reprogrammed and allocated toward payment of the Total Project Cost. After application of these funds, a cost of $144,025 remains to be funded by and apportioned among the Parties ("Adjusted Project Cost"). The Adjusted

Project Cost excludes individual expenses of the Parties regarding for their own review, comment, and approval of the WMP as well as expenses of EMWD in preparing sections of the WMP for which the Scope of Work indicates it is principally responsible.

ARTICLE 2.0 OBLIGATIONS OF THE PARTIES

2.1 **Funding of WMP**. Each of the Parties individually agrees to fund up to their apportioned share of the Adjusted Project Cost as determined in Article 3.0 "Apportionment of Cost" and to pay such share in a lump sum payment within thirty (30) calendar days of receipt of an invoice from EMWD, provided that EMWD invoices the parties in July of 2004 or thereafter in accordance with Attachment 3.

2.2 **Administration of Contract**. EMWD hereby agrees to act as the contracting agency for the preparation of the WMP. In this regard, EMWD shall enter into and execute the appropriate contract(s) with WRIME and the Subconsultants to perform the Scope of Work for an amount not to exceed the Project Cost. EMWD shall also perform the duties set forth in Attachment 3.

ARTICLE 3.0 APPORTIONMENT OF COST

3.1. **Method of Apportionment**. The Parties agree to apportion the Adjusted Project Cost among themselves based on each Party's pro rata share of the total base production of all the Parties as determined by the Hemet/San Jacinto Policy Committee and shown below:

Apportionment of Adjusted Project Cost (*900 af credit taken out)			
Agency	**Base Production (AF)**	**Percentage**	**Cost Contribution**
City of Hemet*	5,420	17.7 %	$ 25,492
City of San Jacinto*	3,131	10.3 %	$ 14,835
LHMWD.	11,063	36.3 %	$ 52,281
EMWD	10,869	35.7 %	$ 51,417
Totals	**30,483**	**100.0 %**	**$144,025**

ARTICLE 4.0 MISCELLANEOUS PROVISIONS

4.1 **Term**. This MOU shall terminate, unless extended by the mutual agreement of the Parties memorialized in writing, upon acceptance of the completed WMP by the governing boards of each of the Parties, provided the Consultant has been fully paid for the Scope of Work and has released the Parties, and each of them, from any claims for further or additional compensation for the Scope of Work.

4.2 **Ownership of Documents**. The WMP together with all data, information, materials and reports (including electronically or digitally stored materials) produced in the preparation of the WMP shall become the joint property of the Parties upon acceptance of the WMP.

4.3 **Individual Costs & Expenses**. Except for the costs and expenses which the Parties have collectively agreed to fund as provided in Article 3.0 "Apportionment of Funding" of this MOU, any cost or expense incurred any one of the Parties with regard to the WMP or its review or approval, shall remain the sole cost and expense of the incurring Party.

4.4 **Authority**. The individuals executing this Agreement on behalf of the Parties and the instruments referenced on behalf of the Parties represent and warrant that they have the legal power, right and actual authority to bind the Parties to the terms and conditions hereof and thereof.

4.5 **Counterpart Originals**. This Agreement may be executed in original counterparts, which together shall constitute a single agreement.

4.6 **Effective Date**. This MOU has become effective among and between the Parties on the date by which each Party's governing board or council has approved the MOU and the authorized representative of each Party has executed the MOU.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding on the date and year first above written.

EASTERN MUNICIPAL WATER DISTRICT

By: _____
_____, General Manager

LAKE HEMET MUNICIPAL WATER DISTRICT

By: _____
ROBERT V. LINDQUIST, JR., General Manager

[additional signatures on following page]

CITY OF HEMET

By: _____
Steve Temple, City Manager

ATTEST:

By: Sarah McComas
~~for Stephen Clayton~~ Sarah McComas
Deputy City Clerk

Approved as to Form:

By: Julie H. Biggs
~~Eric S. Vail~~ Julie H. Biggs
Assistant City Attorney

CITY OF SAN JACINTO

By: Peter A. Cosentino
Peter A. Cosentino, City Manager

ATTEST:

By: Dorothy L. Chavinard
City of San Jacinto
City Clerk

Approved as to Form:

By: [illegible]
~~Robert Hargreaves~~ Bob Katz Manager
City Attorney

ATTACHMENT 1

(Scope of Work)

ATTACHMENT 1

(Scope of Work)

ATTACHMENT 1

(Scope of Work)

Hemet/San Jacinto Groundwater Management Area
Water Management Plan
SCOPE OF WORK

April 23, 2004

Introduction

The Stakeholders in the Hemet/San Jacinto Groundwater Management Area are working to develop a strong foundation to guide and support responsible water management throughout the management area well into the future. The central component of this foundation is to be a Water Management Plan (WMP). The representatives of the stakeholders (Eastern Municipal Water District, Lake Hemet Municipal Water District, Cities of Hemet and San Jacinto, and Private Water Producers) in the Policy Committee (PC) have recently agreed on and signed the Principles for Water Management (Principles) in the basin. In addition, the Stakeholders are working with the Soboba Tribe and the Federal Government to develop a Settlement Agreement that would address past water use practices in the basin and make provision for the water rights of the Soboba Tribe. The Settlement Agreement would provide sufficient legal and technical basis for future water supplies for the Tribe.

The Principles are the basis from which the parties will develop a WMP for the area. The representatives of the stakeholders in the Technical Committee (TC) have provided the proper technical analysis, foundations, and recommendations to the PC so that the PC members can make technically sound decisions. The Department of Water Resources (DWR) has entered into a Memorandum Of Understanding (MOU) to provide financial, technical, and facilitation support to the Stakeholders, so that a long-term sustainable groundwater management plan is developed by the local stakeholders for the basin. To meet its MOU obligations, the DWR staff and Consultant have provided appropriate technical and engineering support to the TC and PC. The Principles are established in-lieu and in anticipation of further guidance that may be provided by a stipulated judgment of the court established to resolve outstanding groundwater issues.

The work performed to-date have been related to development of the Basin Assessment Report (BAR), the Integrated Water Management Plan (IWMP), and to lay the foundations for the WMP, which includes:

- Review and Analysis of Fruitvale production records and conveyance water practices
- Operational Yield Study (Jan 2003)
- Assessment of Historical and Projected Land and Water Use Data (TM 1- June 2003)

- Description of Preferred Potential Conjunctive Use Projects (TM 2 – May 2003)
- Identification and screening of recharge sites and projects
- Preliminary screening of recharge sites for modeling analysis
- Modeling of the recharge sites and their effectiveness to enhance groundwater levels in each subarea

Additional work has been performed by the local agencies that will be used as part of the supporting analysis and documents for development of the Water Management Plan. These are:

- Development of San Jacinto Watershed Groundwater Model for EMWD
- Report on Feasibility Analysis of the San Jacinto River Recharge & Extraction Project
- Draft Environmental Impact Report (To be published in April 2004)

In addition, as part of the IWMP, the following work is under study by local stakeholders and/or by the Consultants:

- Water Supply Reliability
- Conjunctive Use Analysis
- Water Supply Contingency Plan
- Groundwater Monitoring Plan
- Regional Water Resources Database
- Feasibility analysis of Cienega and Fairview Ponds for Recharge

Additional work is required to develop a WMP to support the Settlement Agreement, implement the Principles, and manage the available supply consistent with the agreements and any court ordained requirements. The program to make the Principles effective needs to be designed to integrate approaches for implementation of demand side solutions, non- structural management solutions, and to establish priorities for new water supply capital facilities.

The Water Management Plan document to be produced as part of this Scope of Work will be an agreed upon guideline for existing and projected general conditions of the basin, as well as overview of the planned facilities at various stages to meet the future water supply needs in the basin. Additional detail studies will be required to evaluate the individual projects and/or groups of projects to meet the water needs in the basin.

Scope of Work

The following scope of work is intended to support preparation of the Hemet/San Jacinto Groundwater Management Area Water Management Plan (WMP) Report as currently conceived in the DRAFT outline dated March 15, 2004.

In order to complete the WMP document on time and within the limited budget, the consultant team (WRIME, Stetson, Geoscience) will be working closely with the management and staff of the agencies, as well as the legal team to ensure proper coordination and communication, appropriate analysis, and quality work product.

The activities required to develop the WMP are grouped in the following Tasks:

Task 1. Refinement of Safe Yield Analysis

The purpose of this task is to pull together the information with regards to groundwater basin safe yield estimates made in the past, refine the methodology used to estimate the safe yield of the basin, and develop an appropriate methodology and estimate for the safe yield of the basin.

The following will be performed:

- Collect and document previous safe yield studies; and
- Refine and document safe yield estimate;

WRIME will be responsible to perform this Task with Geoscience performing the review of methodology.

Task 2. Analysis of Groundwater Quality Conditions

The purpose of this task is to document the general water quality conditions using existing and available data, including known or potential sources of degradation that could pose a risk to groundwater and potentially reduce the available groundwater supply. The water quality data available in electronic formats will be aggregated from various sources; each source and the data quality will be documented. An inventory of water quality issues will be developed, and water quality standards and objectives consistent with the Regional Water Quality Control Board Basin Plan will be presented.

The following will be performed:

- Collect historical groundwater quality data. This includes surface water data from various sources, including the RWQCB and USGS.
- Map and identify known degraded sites. Identify sites that could impact groundwater quality. This includes current and known remediation and treatment program sites and other sites contained in the existing DHS drinking source water assessments program (DSWAP) mapping database.
- Identify water quality constraints. Using maps, tables, and graphs current water quality conditions.

WRIME will be responsible to perform this Task with Geoscience performing the review of methodology.

Task 3. Preparation of DRAFT Water Management Plan Document

The purpose of this task is to collect the information and analysis performed as part of other past studies, as well as Tasks 1 and 2 of this Scope of Work, and to prepare the draft of the WMP document. The outline of the WMP document as discussed and approved by the attorneys is attached as Exhibit A. Following is a brief description of each major section of the WMP along with preliminary assumptions that would be considered in the write-up.

Executive Summary

This section will present an executive summary of the WMP document. The section will present the general findings of the plan supported by appropriate graphics, as necessary. *WRIME will be responsible for this section, and it will be approximately 5 pages.*

3.1. Introduction

This section will include the overview of the Plan, and discuss the goals of the WMP. The introduction will be brief and will lay out the background to the plan development and its intended use. *WRIME will be responsible for this section, and it will be approximately 2 pages.*

3.2. Management Plan Framework

This section will introduce the Management Plan participants with a brief history and background on each organization, including role of the State; discuss the geographic boundaries of the sub-basins in the management area; provide a brief discussion of the past agreements and past related activities leading to the WMP. Appropriate GIS maps will be produced to assist in presentation of the material. *WRIME will be responsible for this section, and it will be approximately 5 pages.*

3.3. State of The Basin

The purpose of this task is to establish the historical and existing conditions of the groundwater basin. This will assist in development of baseline conditions in the future for analysis of alternative water management plan options. Consultant will describe existing physical settings, key planning assumptions, review historical, current, and forecasted conditions, using existing studies and data; this includes basin geology and sub-basin boundaries, basin hydrology, rainfall, surface water, basin groundwater levels, basin recharge conditions, and groundwater quality conditions. Majority of the information for this section is available from previous work efforts, other than the discussion on groundwater quality, which will depend on some past reports, but mostly on the work performed under Task 2. *WRIME will be responsible for this section, and it will be approximately 25*

pages. Geoscience and Stetson will provide support and overview on this Task.

3.4. Existing Water Supplies

This task will include review of the previous reports and investigations describing the status of water supplies to each stakeholder agency. This section of the document will explain in general terms the sources of water supply, average annual historical amount of each supply, and trends for future availability of water supplies for each stakeholder. There will be no analysis of water supply conditions or forecasting of the reliability of supplies as part of this Task. Appropriate GIS maps will be produced to assist in presentation of the materials. *WRIME will be responsible for this section, and it will be approximately 10 pages.*

3.5. Groundwater Rights

This task will primarily rely on the information provided by the attorneys and EMWD on the base groundwater production rights for the public agencies, private producers, and the Soboba Tribe. This section of the document will reference legal or other documents that cite the groundwater rights and responsibilities of each stakeholder, describe the methodology used for development of base production rights, and schedule for adjustments of such rights.

*The Legal Team **(Firm or person)** will be responsible to author this section. Stetson will review and coordinate to ensure proper context is developed. WRIME will be responsible for technical editorial and insertion into the WMP document.*

This section will be approximately 5 pages.

3.6. Surface Water Rights

This section describes the surface water rights of both LHMWD and EMWD based on information provided by the attorneys, as well as how these rights are to be preserved in the WMP and as part of the Principles.

*The Legal Team **(Firm or person)** will be responsible to author this section. Stetson will review and coordinate to ensure proper context is developed. WRIME will be responsible for technical editorial and insertion into the WMP document.*

This section will be approximately 1-2 pages.

3.7. Other Soboba Tribe Settlement Requirements

This section will provide description of requirements for the settlement of the Tribe water rights issues, including discussions on any financial obligations, responsibilities in providing water to the Tribe when it cannot produce water

from the basin, as well as issues with respect to groundwater quality limitations on the recharge water in the Canyon sub-basin. This section will rely to a large extent on the Draft Environmental Impact Report (DEIR) document, as well as other information provided by EMWD and/or LHMWD. No additional information and/or data collection or analysis of data will be done as part of this Task.

*The Legal Team **(Firm or person)** will be responsible to author this section. Stetson will review and coordinate to ensure proper context is developed. WRIME will be responsible for technical editorial and insertion into the WMP document.*

This section will be approximately 5 pages.

3.8. Institutional Plan

EMWD is the leading stakeholder in developing the institutional plan. This information will be developed, discussed, and agreed upon in the by the agency managers, attorneys, and consultants. The information will be synthesized and documented by EMWD and included as part of this section of the document. Minor coordination and editorial effort needed to include this section in the document.

EMWD will be responsible to author this section. EMWD will be responsible to coordinate with the CAM, TC and PC members to ensure that the approach, content, and documentation is agreed upon by the Stakeholders and/or their representatives. All graphics, charts, and tables will be developed by EMWD. WRIME will be responsible for technical editorial to ensure consistency with the remaining sections of the document, as well as insertion into the WMP document.

This section will be approximately 10 pages.

3.9. Water Supply Plan Elements

The purpose of this task is to develop section 9 of the WMP document. This task includes review of the past documents, including the Basin Assessment Report (BAR), Integrated Water Management Plant (IWMP) Technical Memoranda, and DEIR for the Integrated Recharge and Recovery Program (IRRP), synthesis of the information, and documentation of the various water supply elements for the WMP.

No new information and/or analysis will be made as part of this Task. It is assumed that the information is available in the existing documents to be provided by EMWD.

WRIME will be responsible for this section, with overview by Geoscience and Stetson. This section will be approximately 10 pages.

3.10. Future Water Supply Projects

The purpose of this task is to develop section 10 of the WMP document. This task includes review of the recently developed documents in the Basin Assessment efforts and the IWMP Technical Memoranda, as well as the DEIR for the IRRP to synthesis the information on planned and potential water supply projects. There will be no additional analysis, studies, and/or information collection on these projects; the document will solely rely on the past work performed, summarize the information, and to the extent possible will identify future work plans needed to move these projects forward.

No new information and/or analysis will be made as part of this Task. It is assumed that the information is available in the existing documents to be provided by EMWD.

WRIME will be responsible for this section, with overview by Geoscience and Stetson. This section will be approximately 10 pages.

3.11. Financial Plan

EMWD is the leading stakeholder in developing the financial plan. This information will be developed, discussed, and agreed upon in the by the agency managers, attorneys, and consultants. The information will be synthesized and documented by EMWD and included as part of this section of the document. Minor coordination and editorial effort needed to include this section in the document.

EMWD will be responsible to author this sections. EMWD will be responsible to coordinate with the CAM, TC and PC members to ensure that the approach, content, and documentation is agreed upon by the Stakeholders and/or their representatives. All graphics, charts, and tables will be developed by EMWD. WRIME will be responsible for technical editorial to ensure consistency with the remaining sections of the document, as well as insertion into the WMP document.

This section will be approximately 15 pages.

3.12. Implementation Plan

EMWD is the leading stakeholder in developing the implementation plan. This information will be developed, discussed, and agreed upon in the by the agency managers, attorneys, and consultants. The information will be synthesized and documented by EMWD and included as part of this section of the document. Minor coordination and editorial effort needed to include this section in the document.

EMWD will be responsible to author this sections. EMWD will be responsible to coordinate with the CAM, TC and PC members to ensure that

the approach, content, and documentation is agreed upon by the Stakeholders and/or their representatives. All graphics, charts, and tables will be developed by EMWD. WRIME will be responsible for technical editorial to ensure consistency with the remaining sections of the document, as well as insertion into the WMP document.

This section will be approximately 10 pages.

Task 4. Production and distribution of draft WMP document

4.1. Draft WMP Document

This task includes the effort needed to produce the WMP draft document, including word-processing, technical editorial, and production of the report. Electronic copies of the document version in MS Word format will be distributed for comment.

4.2. Final WMP Document

This task includes efforts to incorporate the comments on the draft report, and finalizing the document. Fifteen hard copies of the report, along with electronic copy in PDF version will be submitted.

Task 5. Coordination Meetings and Project Management

This task includes project management time to coordinate the work performed under this scope with the stakeholder agencies as well as other team members, including subconsultants. This task also includes time to attend the following coordination meetings:

- Up to two (2) TC Meetings to discuss the methodology and results of Tasks 1 and 2
- Up to two (2) PC meetings to present the findings of the WMP
- Up to four (4) CAM meetings to coordinate with the CAM members on the development of the WMP document and its relation and coordination with the Settlement Agreement, Stipulated Judgment, and the Principles.

Task Responsibilities

In order to ensure proper coordination and identify clear responsibilities for authorship of various sections of the document, Table A presents the responsible person(s) for each task and/or subtask.

Table A- Task Responsibility

Task	Lead	Support & Review	
1	WRIME	Stetson, Geoscience	
2	WRIME	Stetson, Geoscience	
3			
3.1	WRIME	Stetson, Geoscience	
3.2	WRIME	Stetson, Geoscience	
3.3	WRIME	Stetson, Geoscience	
3.4	WRIME	Stetson, Geoscience	
3.5	Legal Team	Stetson, WRIME	
3.6	Legal Team	Stetson, WRIME	
3.7	Legal Team	Stetson, WRIME	
3.8	EMWD	WRIME	
3.9	WRIME	Stetson, Geoscience	
3.10	WRIME	Stetson, Geoscience	
3.11	EMWD	WRIME	
3.12	EMWD	WRIME	
4	WRIME	Stetson, Geoscience	
5	N/A		

Estimated Cost

Table B presents the estimated cost to perform the water quality analysis, safe yield analysis, and complete the WMP document. The detail hours and billing rates are included in a supporting spreadsheet table.

Table B- Estimated Budget

Task	Budget
1- Safe Yield Analysis	$14,540
2- Water Quality Inventory	$18,852
3- WMP Preparation	$90,890
4- Document Preparation	$21,476
Ten Percent Contingency for Tasks 1-4	$14,562
5- Project Management, Coordination, and Meetings	$20,560
Project Management	*$3,680*
Coordination with Agencies	*$1,990*
2 TC Meetings	*$4,990*
2 PC Meetings	*$3,300*
4 CAM Meetings	*$6,600*
Total	**$180,894**

ATTACHMENT 2

(WMP Budget)

ATTACHMENT 2

(WMP Budget)

ATTACHMENT 2

(WMP Budget)

Hemet/San Jacinto Groundwater Management Area
Water Management Plan
ESTIMATE OF COST
23-Apr-04

Task	Subtask/ Chapter	Description	Ali	Steve	Dennis	LHMWD Consultant	Financial Consultant	Matt	Super-vising	Senior	Associate	Assistant	GIS	Graphics/ CAD	Admin/ Secy	ODC	Cost
		Hourly Labor Rate	*$175*	*$175*	*$175*	*$175*	*$175*	*$160*	*$150*	*$135*	*$120*	*$90*	*$98*	*$80*	*$50*	*$1*	
1	**Refinement of Safe Yield analysis**		**8**	**0**	**12**	**0**	**0**	**6**	**0**	**0**	**72**	**16**	**0**	**0**	**0**	**$0**	**$14,540**
1	1	Collect and document previous safe yield studies									8						$960
1	2	Refine and document safe yield estimate	4					2			64						$8,700
1	5	Review Safe Yield Analysis	4		12			4				16					$4,880
2	**Analysis of groundwater quality conditions**		**4**	**0**	**8**	**0**	**0**	**18**	**0**	**0**	**96**	**0**	**24**	**0**	**0**	**$0**	**$18,852**
2	1	Collect historical groundwater quality data[1]	2					4			40						$5,790
2	2	Map and identify known contamination sites						4			16		16				$4,128
2	3	Identify water quality constraints	2		8			10			40		8				$8,934
3	**Preparation of draft Water Management Plan Document**		**136**	**54**	**32**	**0**	**0**	**86**	**0**	**0**	**286**	**0**	**20**	**0**	**40**	**$0**	**$90,890**
3		Executive Summary	40	4	4			24			8				4		$13,400
3	1	Introduction	24	2	2			2			8				4		$6,380
3	1.1	*Overview of Management Plan*															
3	1.2	*Water Management Plan Goals*															
3	2	Management Plan Framework	4	2	2			2			16		8		2		$4,524
3	2.1	*Management Plan Participants*															
3	2.2	*Management Area*															
3	2.3	*Previous Agreements and Institutional Bodies*															
3	2.4	*Activities Related to management of the GW Basins*															
3	3	State of the Basin	16	8	8			12			128		12		4		$24,256
3	3.1	*Basin Geology and Boundaries*	1								4		1				
3	3.2	*Basin Hydrology*	1								4		1				
3	3.3	*Basin Groundwater Conditions*	1								12		1				
3	3.4	*Basin Surface Water Conditions*	1								4		1				
3	3.5	*Key WQ Constituents of Concern*	1					2			8						
3	3.6	*GW Quality Conditions*	4					4			40		4				
3	3.7	*SW Quality Conditions*	2					2			16		4				
3	3.8	*Imported Quality Conditions*	1					2			8						
3	3.9	*Reclaimed Quality Conditions*	1					2			8						
3	3.10	*Current Water Demands*	1								4						
3	3.11	*Estimates of Safe Yield and Overdraft*	1								16						
3	3.12	*Projected Water Demands*	1								4						
3	4	Existing Water Supplies	4	2	2			8			24				2		$5,660
3	5	Groundwater Rights	4	12	2						4				2		$3,730
3	5.1	*Public Agencies Base Production Rights*															
3	5.2	*Private Pumpers Production Rights*															
3	5.3	*Soboba Tribe Water Rights*															
3	6	Surface Water Rights	4	4	2						4				2		$2,330
3	6.1	*LHMWD's Diversion Rights*															
3	6.1	*EMWD's Diversion Rights*															

Hemet/San Jacinto Groundwater Management Area
Water Management Plan
ESTIMATE OF COST

23-Apr-04

Task	Subtask/ Chapter	Description	Ali	Steve	Dennis	LHMWD Consultant	Financial Consultant	Matt	Super-vising	Senior	Associate	Assistant	GIS	Graphics/ CAD	Admin/ Secy	ODC	Cost
		Hourly Labor Rate	*$175*	*$175*	*$175*	*$175*	*$175*	*$160*	*$150*	*$135*	*$120*	*$90*	*$98*	*$80*	*$50*	*$1*	
3	7	**Other Soboba Tribe Settlement Requirements**	8	12	2						10				2		$5,150
3	7.1	*Financial Obligations*									2						
3	7.2	*Settlement of All Water Rights Claims*									2						
3	7.3	*Water Purchases from MWD*									2						
3	7.4	*Plan Obligations to Supply Water to Soboba Tribe*									2						
3	7.5	*Quality Limits on Canyon Sub-basin recharged water*									2						
3	8	**Institutional Plan**	8	1	1			2			12				4		$3,710
3	8.1	*Watermaster*															
3	8.2	*Technical Committee*															
3	9	**Water Supply Plan Elements**	4	2	2			16			24				4		$7,040
3	9.1	*Replenishment*															
3	9.2	*Direct Delivery of Imported Water*															
3	9.3	*Direct Delivery of Recycled Water*															
3	10	**Future Water Supply Projects**	4	2	2			16			24				2		$6,940
3	10.1	*Planned Water Supply Projects*															
3	10.2	*Potential Water Supply Projects*															
3	11	**Financial Plan**	8	1	1			2			12				4		$3,710
3	11.1	*Administrative Assessments*															
3	11.2	*Replenishment Assessments*															
3	11.3	*Payment of $10 million to Tribe*															
3	11.4	*Receiving of $10 million from Federal Government*															
3	11.5	*Payment of $7 million for Unused Water*															
3	11.6	*Operational Expenses*															
3	11.7	*Capital Improvement Expenses*															
3	12	**Implementation Plan**	8	2	2			2			12				4		$4,060
3	12.1	*Administrative Responsibility*															
3	12.2	*Operational Responsibility*															
3	12.3	*Ownership of Facilities*															
3	12.4	*Capital Improvement Responsibility*															
4		**Production and distribution of draft WMP document**	8	14	14	16	0	26	0	0	36	0	2	20	32	$500	$21,476
4	1	**Draft WMP Document (electronic copy only)[2]**						1			4			12	16		$2,400
4		**Draft document review**		12	12	16											$7,000
4		**Address Comments on DRAFT Document**	4	2	2			24			16		2				$7,356
4	2	**Final WMP Document[3]**	4					1			16			8	16	$500	$4,720
		10% Contingency on performing the project work	16	7	7	2	0	14	0	0	49	2	5	2	7	$50	$14,576
5		**Coordination and Meetings and Project Management**	82	0	0	0	0	0	0	0	28	0	0	0	12	$2,250	$20,560
5		**Project management**	16								4				8		$3,680
5		**Coordination with Agencies**	2								12				4		$1,990
5		**2 TC Meetings**	16								12					$750	$4,990
5		**2 PC Meetings**	16													$500	$3,300
5		**4 CAM Meetings**	32													$1,000	$6,600
		Total	254	75	73	18	0	150	0	0	567	18	51	22	91	$2,800	$180,894

1 Data is assumed to be readily available in electronic form from local, state, and federal sources including RWQCB and USGS
2. Draft documents will be delivered electronically
3. 15 copies of 150-page documents with some color figures
4. 2 TC, 2 PC, and 4 CAM meetings in Perris/Hemet for Ali, 1 TC and 4 CAM meetings for Dennis and Steve in Perris/Hemet

ATTACHMENT 3

(EMWD Role and Responsibilities)

EMWD ROLE AND RESPONSIBILITIES

In furtherance of the goals and objective established in the Principles of Water Management and prior to the formation of an organization to oversee the Watermaster's needs and requirements, the Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District (LHMWD), and Eastern Municipal Water District (EMWD) have agreed to work as partners toward the preparation of the Water Management Plan outlined in the Memorandum of Understanding to which this document is attached.

EMWD is hereby appointed as the Contract Administrator for purposes of preparation of the Water Management Plan ("WMP"). EMWD shall have the following responsibilities:

- Continue efforts to acquire grants from DWR as may be applicable to preparation of the WMP.
- Prepare and submit invoices for each participant based on shares identified in the MOU, above, or any other amendments agreed upon by all participants.
- Provide its pro rata share of the WMP Adjusted Project Costs based on estimates outlined in the MOU.
- Establish a restricted account for the WMP funds.
- Manage WMP funds and provide a quarterly status reports on funds and expenditures.
- Contract with WRIME and/or GEOSCIENCE and Stetson Engineers as necessary to procure preparation of the WMP as provided in the MOU.
- Administer the contract(s) for preparation of the WMP, interface with and monitor the work of the consultants retained.
- Provide quarterly status reports to the Policy Committee Representatives on WMP preparation and completion.
- Prepare the sections of the WMP identified in the MOU for which EMWD has been designated as responsible.
- Hire additional outside consultants and/or resources if required, provided any additional expenses for preparation of the WMP over and above the Adjusted Project Cost shall be submitted to the contributing parties for their prior approval and agreement as to allocation of costs.