



APPENDIX D
WATER STUDY FOR THE MURRIETA
GENERAL PLAN UPDATE AND EASTERN
MUNICIPAL WATER DISTRICT POTENTIAL
ANNEX AREA



City of Murrieta General Plan Update

Water Study for the Murrieta General Plan Update and Eastern Municipal
Water District Potential Annex Area

June 2019

Prepared for: Rick Engineering



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1. Introduction and Purpose

The purpose of this study is to review potential water supply and water system impacts as a result of the proposed City of Murrieta (City) General Plan Update (GPU) as well as a potential Eastern Municipal Water District (EMWD) Annex Area (Potential EMWD Annex Area) that is currently not served by any water district.

The GPU includes a new land use designation (Innovation) and a revised mix and location of land use designations in six key areas as shown on General Plan Land Use Policy Map (Figure 1). Referring to Figure 1, the proposed GPU focused areas in the City are identified as Area 1 through 6. The Potential EMWD Annex Area, shown on Figure 1, is served by private wells, and is not currently located within any water district. No annexation into EMWD is proposed as part of the project; however, this water study includes a summary of procedures outline that EMWD and the Riverside County Local Agency Formation Committee (LAFCO) would require at this time as part of information needed for an annexation request by the City, should one be necessary in the future.

This water study evaluation and assessment of water system impacts on the General Plan update is based on the following scope of services:

- Review of key EMWD Water Planning Reports:
 - 2015 EMWD Urban Water Master Plan (UWMP)
 - 2016 EMWD Water Facilities Master Plan (WFMP)
- Summarize General Plan changes by land use and acreage
- Estimate increase/decrease in water use based on EMWD Master Plan criteria
- Review and summarize EMWD water supply and distribution capacities to the City of Murrieta
- Establish incremental increases in water demands from the proposed updated land use plan and annexation area
- Facilities assessment for the future annexation area
- Summarize study findings and recommendations

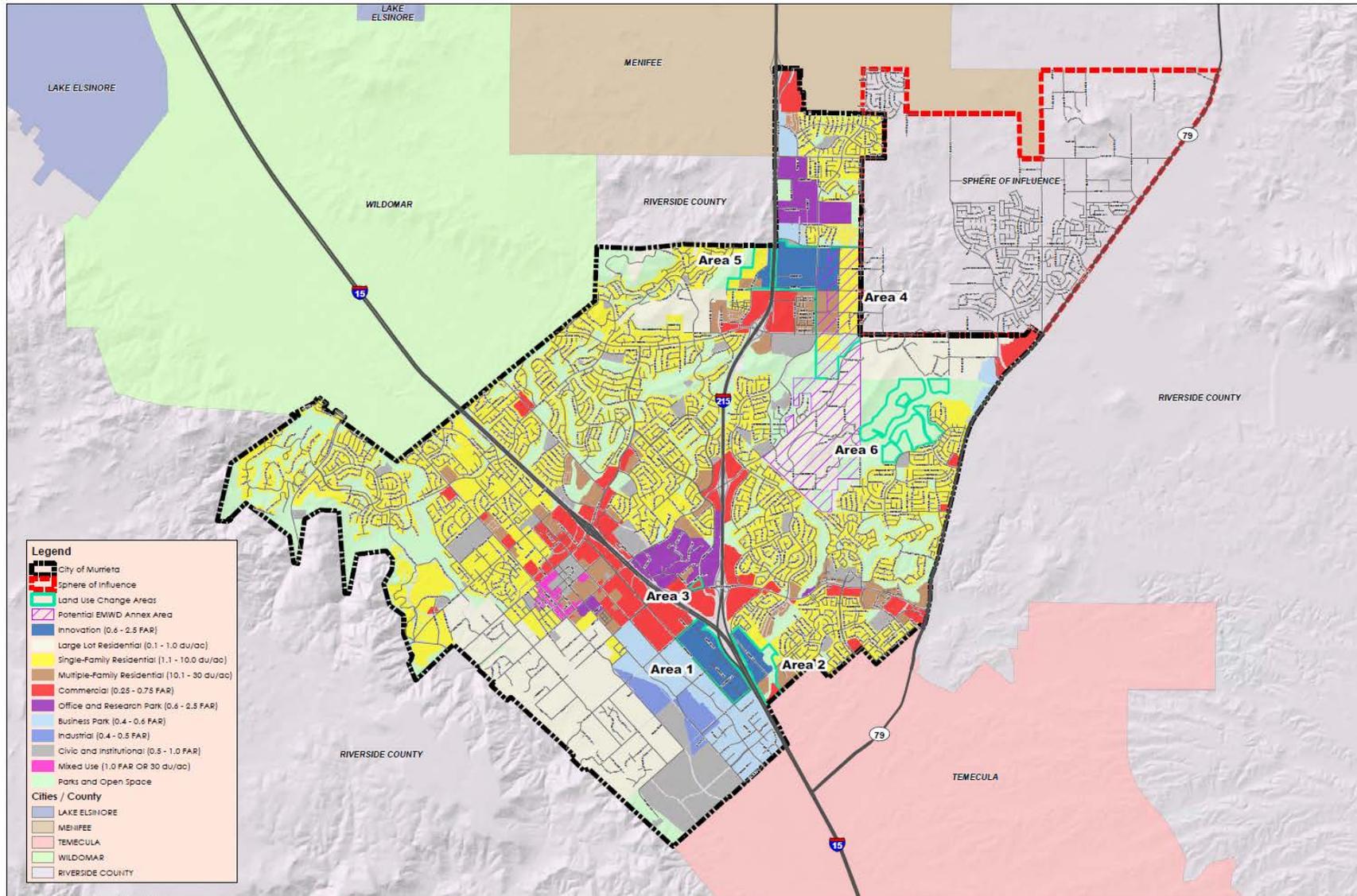
The following sections present an overview of the project, summarize water demand changes, water service evaluation, and facilities assessment for the GPU.

2. Water Districts in City of Murrieta

The City is served potable water by four water districts: Rancho California Water District, Elsinore Valley Water District, Western Municipal Water District, and EMWD. The water districts serving the City are shown in Figure 2. Area 1 through Area 6, depicted on Figure 1, receive water service from EMWD with a few exceptions where no water service is provided by any district. It is anticipated that future development in accordance with the GPU within areas not served by a water district would annex to the appropriate district for service and connection to the infrastructure systems.

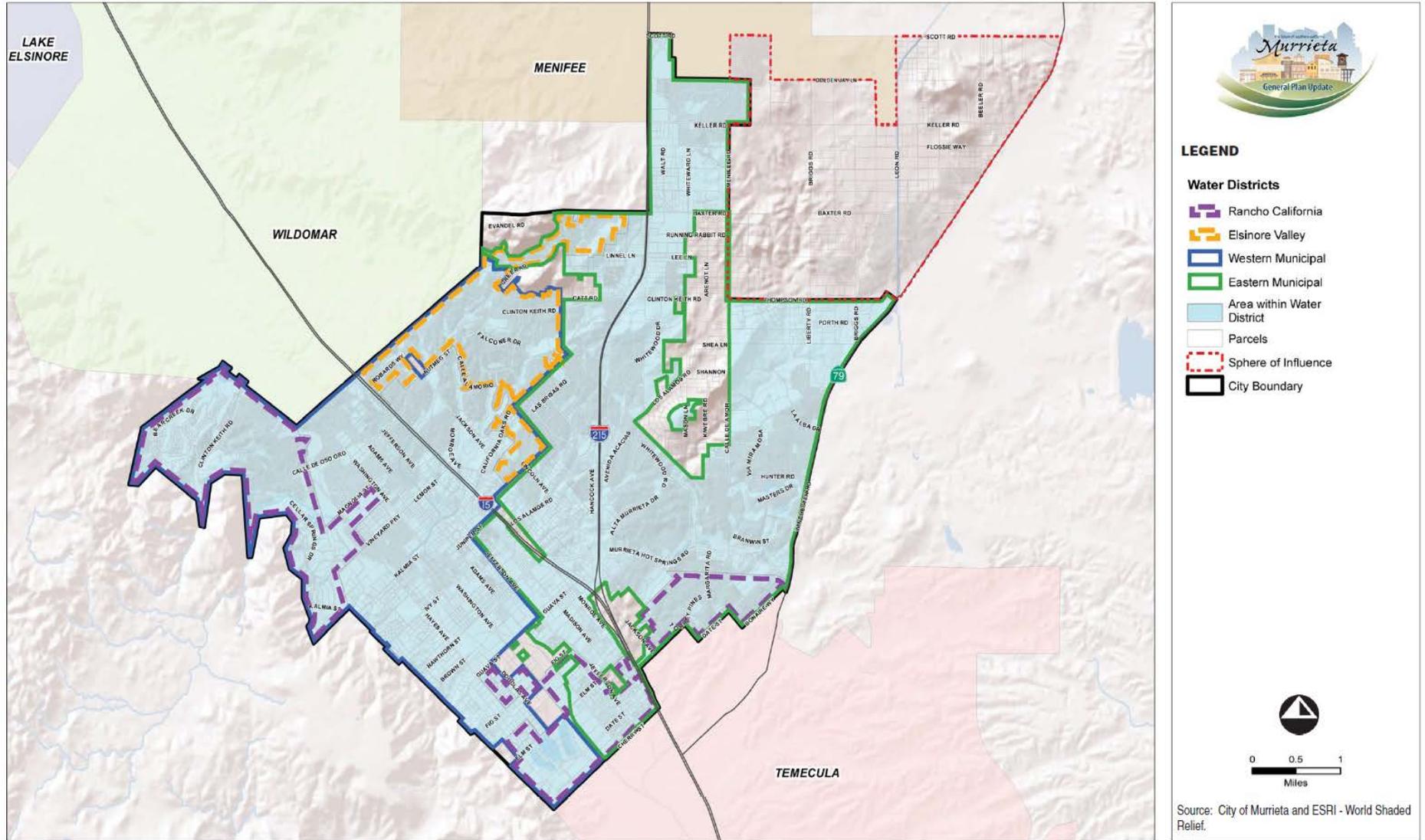
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Figure 1. Proposed General Plan Land Use Policy Map



Source: Rick Engineering, 2019

Figure 2. City of Murrieta Water Districts



Source: City 2011 General Plan Update, Section 5.15

3. Overview of EMWD Services and Facilities

EMWD is the water, wastewater service and recycled water provider to more than 825,000 people living and working within a 555-square mile service area in western Riverside County. It is California's sixth-largest retail water agency. EMWD provides service to retail customers located within the cities of Moreno Valley, Menifee, Murrieta, and Temecula and several unincorporated communities of Riverside County. EMWD also supplies water on a wholesale basis to the Cities of Hemet, San Jacinto and Perris, Lake Hemet Municipal Water District, Nuevo Water Company, Elsinore Valley Municipal Water District, Western Municipal Water District and Rancho California Water District.

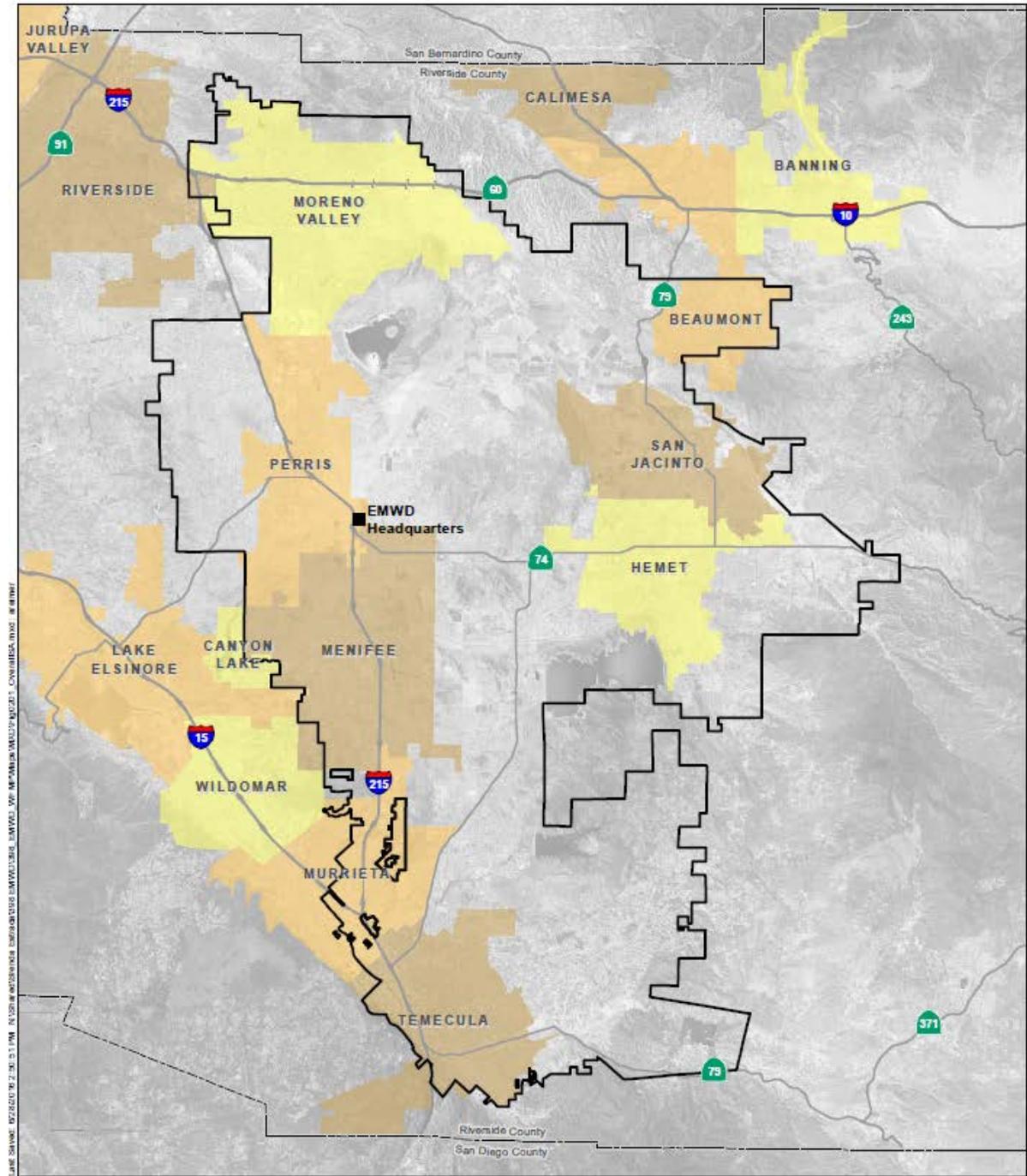
The City is partially located in the southerly portion of EMWD, as shown in Figure 3, within a service sub-area referred to as Temecula Valley and in close proximity to Metropolitan Water District's (MWD's) Robert F. Skinner (Skinner) Water Treatment Plant (WTP). EMWD serves the City with transmission mains, and multiple pressures systems to meet service pressures including pump station and water storage reservoirs. The EMWD 2016 WFMP evaluated this area and identified system improvements required to meet future demands. In general, the service area has sufficient water supply and distribution to support ultimate development of the City General Plan within its service area. Locations of key treatment and distribution facilities for EMWD and MWD are shown in reference figures from EMWD's 2015 UWMP within Appendix A.

EMWD has four sources of water supply: imported water from MWD, local groundwater, desalinated groundwater, and recycled water. Delivery points for each source of water are located throughout the EMWD service area and EMWD's groundwater management zones can be found in the reference figure within Appendix A. Potable imported water is treated and delivered to EMWD directly from MWD's two large filtration plants. The Henry J. Mills (Mills) Water Treatment Plant treats water from Northern California and provides it to EMWD through two connection points located in the northeast portion of EMWD's service area. The Skinner WTP treats a blend of Colorado River water and water from Northern California and provides it to EMWD through a connection point in the southwest portion of EMWD's service area. The major potable water facilities for EMWD are shown in Figure 4.

In addition to the potable water system, EMWD maintains a regional recycled water system that provides tertiary-treated recycled water to customers for agricultural, landscape irrigation, environmental, and industrial use. EMWD's recycled water system consists of four regional water reclamation facilities (RWRFs) that treat municipal sewage and produce water for recycling. The four RWRFs, the San Jacinto Valley RWRf, the Moreno Valley RWRf, the Temecula Valley RWRf, and the Perris Valley RWRf, are spread throughout EMWD's service area. An intricate web of pipelines connects the four RWRFs, as well as several distribution storage ponds, to manage the delivery of recycled water. Key EMWD recycled water facilities are shown in the reference figure within Appendix A.

The City's currently approved 2011 General Plan is accounted for in the EMWD 2015 UWMP, which documents water supply and demands requirements to meet future forecasts 2040. The 2015 UWMP concludes that EMWD has sufficient supply capacities to meet demand conditions throughout its service area, which includes portions of the City.

Figure 3. EMWD Water Service Area

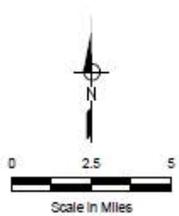


Symbology

- EMWD Service Area

City Limits

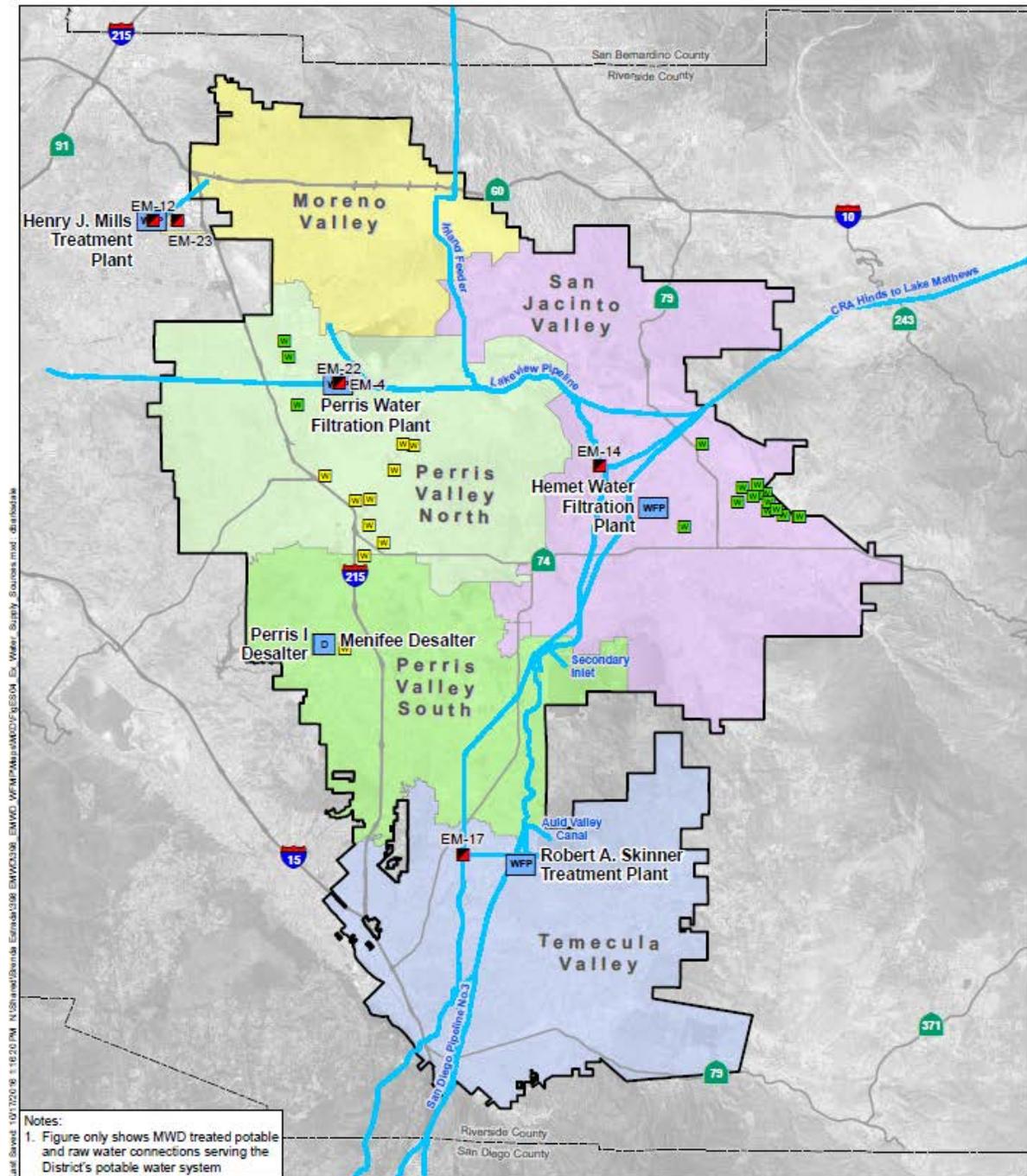
- Banning, Canyon Lake, Hemet, Moreno Valley, and Wildomar
- Beaumont, Jurupa Valley, Lake Elsinore, Murrieta, and Perris
- Calimesa, Menifee, Riverside, San Jacinto, and Temecula



Eastern Municipal Water District
Water Facilities Master Plan

Source: EMWD 2016 WFMP

Figure 4. EMWD Major Potable Water Facilities

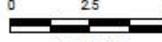


Symbology

- MWD Connection
- Potable Water Well
- W Desalter Well
- D Desalter
- WFP Water Filtration/Treatment Plant
- MWD Water Pipeline
- EMWD Service Area

Operational Service Areas

- San Jacinto Valley
- Moreno Valley
- Temecula Valley
- Perris Valley North
- Perris Valley South



 Scale In Miles


 WEST YOST

 Eastern Municipal Water District
 Water Facilities Master Plan

Source: EMWD 2016 WFMP

As noted above, the City of Murrieta is served potable and recycled water and wastewater by multiple districts, except for a few rural areas that are not currently within a water district, including the Potential EMWD Annex Area. As these rural areas develop in the future and depending on the densities proposed, the areas may be candidates for future annexation into their respective water district for public utility services. Future sections within this water study focus on the Potential EWMD Annex Area and impacts to the EMWD infrastructure.

New development would be required to pay its share of the costs of infrastructure improvements necessary to accommodate the project. Water districts would need to ensure their water reclamation facilities and pipeline infrastructure are planned and installed according to their UWMP projections and the respective water agency facility planning criteria. Additionally, coordination between the City and water districts would be essential as further development is planned. Furthermore, the City has identified the protection and conservation of its existing and future water resources within the proposed General Plan 2035 Infrastructure Element goals and policies.

4. Project Overview and Land Use

The General Plan Update focuses on a planned reduction in non-residential uses and a slight increase in residential uses. Table 1 presents a summary of the breakdown of the land use designation changes, as called out in the City General Plan Update.

Table 1. Land Use Designation Changes in Acreages

Land Use Designation	Existing Adopted GP Acreage	Proposed GP Acreage	Net Change in Acreage
Large Lot Residential	3,030.62	2,927.44	(103.18)
Single-Family Residential	6,255.31	6,215.73	(39.58)
Multiple-Family Residential	661.56	758.03	96.47
Innovation	0	520.79	520.79
Commercial	1,266.58	1,279.26	12.68
Office and Research Park	1,353.70	516.91	(836.79)
Business Park	717.35	717.35	0.00
Industrial	185.47	185.47	0.00
Civic and Institutional	1,064.88	1,064.81	(0.07)
Parks and Open Space	3,474.46	3,824.14	349.68
Mixed Use	59.68	59.68	0.00
Roads	3,441.07	3,441.07	0.00
Total	21,510.68	21,510.68	

The GPU's anticipated change in residential and non-residential components over the 2035 estimated buildout from the 2011 General Plan is as follows:

- Reduction of Large Lot and Single-Family Residential acreages
- Increase of Multi-Family Residential, Commercial, and Parks and Open Space
- Addition of new land use designation (Innovation)
- Decrease in Office and Research Park and Civic and Institutional

The water analysis section below includes an evaluation of the overall impact of these planned land use changes.

5. General Plan Update Analysis

5.1 Water Demand Analysis

The City is served by multiple water purveyors and each water agency utilizes their own water demand planning criteria. For the purposes of establishing the change in potential water demands resulting from the proposed GPU land use revisions, EMWD’s potable water demand criteria, presented in their 2016 WFMP, has been used to estimate water demands for the GPU area. This approach is similar to the water supply analysis presented in the 2011 GPU supporting documentation, which used one blended unit demand set of criteria to establish project water use demands for the GPU area. The estimated Project demands have been calculated and are presented in Table 2.

Table 2. Project Water Demands Based on the GPU 2035 Buildout

Land Use Designation	GP Acreage	GP Dwelling Units	Unit Demand	Proposed Water Demand (gpd)
Large Lot Residential	2,927.44	908	660 gpd/DU	598,954
Single-Family Residential	6,215.73	30,146	440 gpd/DU	13,264,368
Multiple-Family Residential	758.03	14,115	290 gpd/DU	4,093,210
Innovation	520.79		2,200 gpd/ac	1,145,738
Commercial	1,279.26	4	2,200 gpd/ac	2,815,532
Office and Research Park	516.91	20	2,200 gpd/ac	1,143,002
Business Park	717.35		2,200 gpd/ac	1,578,170
Industrial	185.47		3,300 gpd/ac	612,051
Civic and Institutional	1,064.81		2,200 gpd/ac	2,342,582
Parks and Open Space	3,824.14		0 gpd/ac	-
Mixed Use	59.68	731	2,200 gpd/ac	343,286
Roads	3,441.07		0 gpd/ac	-
Total	21,510.68			27,936,893

The land use summary from the 2011 General Plan, utilizing the EMWD water unit demand criteria from the 2016 WFMP, would result in a 2035 total water demand of 28.19 million gallons per day. These 2011 GPU estimated demands are shown in Table 3.

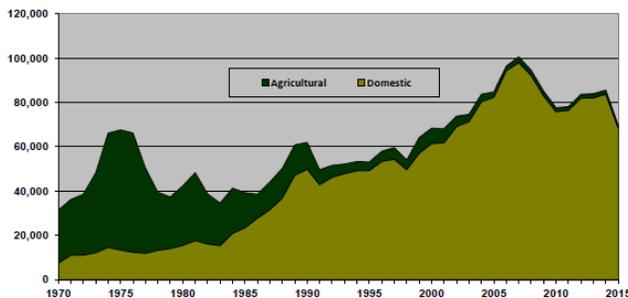
Table 3. Project Water Demands Based on the Adopted 2011 General Plan 2035 Buildout

Land Use Designation	GP Acreage	GP Dwelling Units	Unit Demand	Existing Water Demand (gpd)
Large Lot Residential	3,030.62	939	660 gpd/DU	620,065
Single-Family Residential	6,255.31	30,338	440 gpd/DU	13,348,832
Multiple-Family Residential	661.56	12,318	290 gpd/DU	3,572,292
Innovation	0		2,200 gpd/ac	-
Commercial	1,266.58	4	2,200 gpd/ac	2,787,636
Office and Research Park	1,353.70	20	2,200 gpd/ac	2,983,940
Business Park	717.35		2,200 gpd/ac	1,578,170
Industrial	185.47		3,300 gpd/ac	612,051
Civic and Institutional	1,064.88		2,200 gpd/ac	2,342,736
Parks and Open Space	3,474.46		0 gpd/ac	-
Mixed Use	59.68	731	2,200 gpd/ac	343,286
Roads	3,441.07		0 gpd/ac	-
Total	21,510.68			28,189,007

The proposed decrease in water demands from the 2011 General Plan is approximately one percent, under the proposed GPU and based on unit water demand criteria from the 2016 EMWD WFMP.

Overall, EMWD continues to see a decline in overall water usage as many agricultural areas transition to development. Figure 5 below from the 2015 UWMP illustrates this trend, where usage the past few years is 30 percent below the peak year usage in the past. As a result, EMWD continues to maintain sufficient infrastructure to supply current and planned land uses.

Figure 5. Retail Potable Water Sales (1970-2015)



Source: EMWD 2015 UWMP, Table 4-1

6. Potential Annexation Area Analysis

The General Plan Update includes potential increased development in portions of the City that would be a candidate for future annexation into EMWD for public utility services should those areas develop in the future. Figure 1 depicts the Potential EMWD Annex Area which primarily consists of existing rural residential homes at lower densities and undeveloped lands. Water is provided by private wells and sewer serviced through onsite septic systems. If this area develops and potentially densifies, a portion of or the entirety of the area may be considered for annexation into EMWD. Other drivers for annexation could include lowered groundwater tables, which would affect private well production.

Referring to the Potential EMWD Annex Area in Figure 1, this area within a municipality is commonly referred to as an island area. Riverside County LAFCO encourages municipal and agency collaboration to facilitate these type of annexations to provide more efficient and reliable service. This process is referred to as a re-organization and can be a stream-lined process when all the affected agencies, including EMWD and MWD, and the City support the annexation.

Future annexation proceedings would be initiated through EMWD. EMWD is a member agency within MWD’s service boundary, so in addition to a future EMWD annexation, the area is also not part of the MWD current service area and would therefore have to also be annexed into MWD water service area. Each agency will require payment of fees which may include annexation fees, capacity fees, and other administrative costs. MWD also encourages annexations of these island areas and prefers that the areas be included/annexed as part of one proceeding.

EMWD has developed the following procedures and processes for areas that request annexation into their service area, including the following required documentation:

- Plan for Implementing Water Efficiency Measures
- Plan of Service
- LAFCO Application
- Maps and Legal Description (per MWD and LAFCO requirements)

6.1 Potential EMWD Annex Area Water Demand Analysis

Table 4 below summarizes the potential water demands for the Potential EMWD Annex Area, as shown on Figure 1 and Figure 6, based on land uses under the 2011 General Plan and the proposed General Plan Update.

Figure 6. Potential EMWD Annex Area

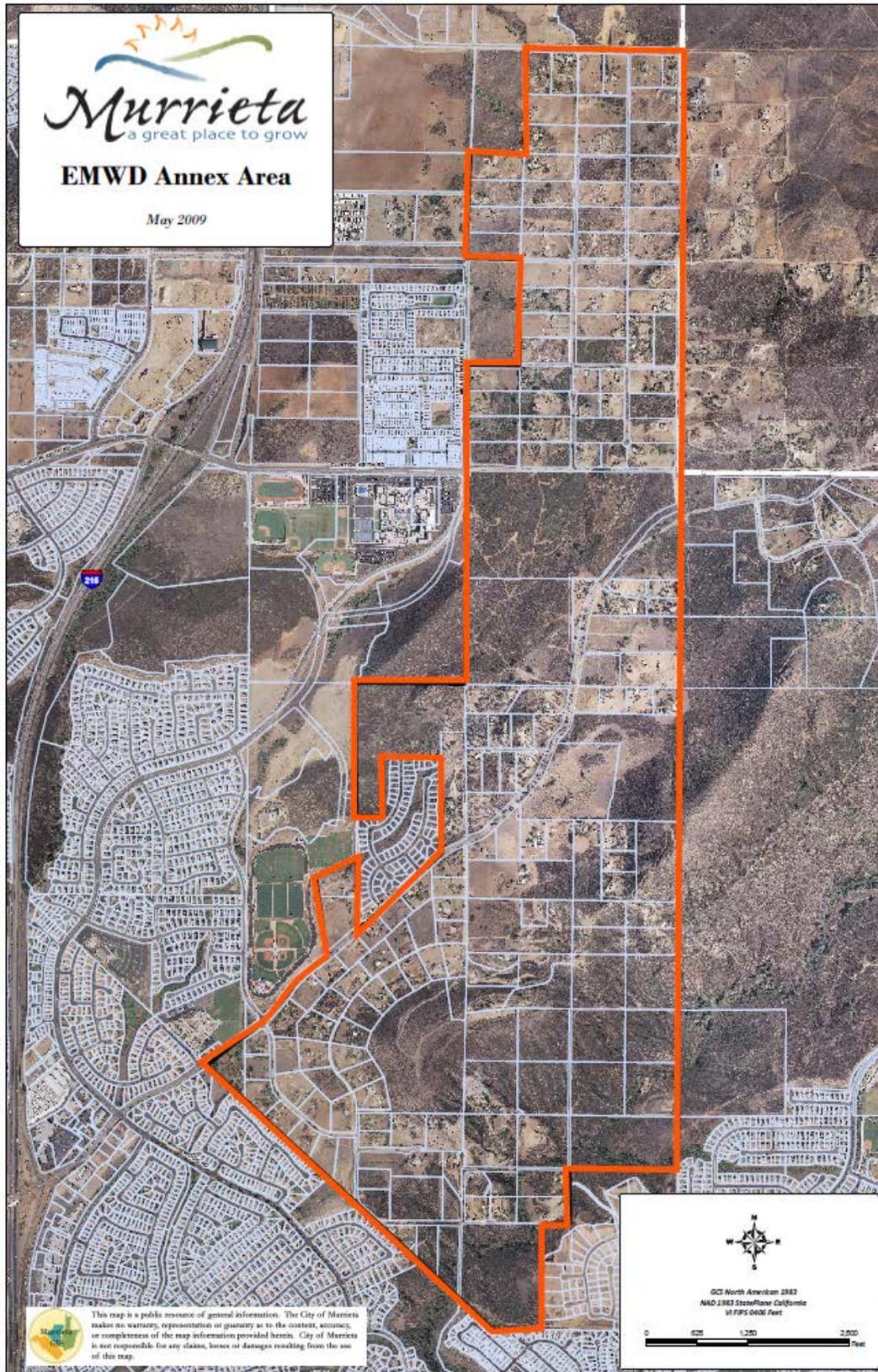


Table 4. Annexation Area Water Demands

Land Use	Existing Acreage	Existing Dwelling Units	Proposed Acreage	Proposed Dwelling Units	Unit Demand	Existing Water Demand (gpd)	Potential Water Demand (gpd)
Large Lot Residential	680.05	211	576.87	179	660 gpd/DU	139,138	118,027
Single Family Residential	0.00	0.00	169.48	822	440 gpd/DU	-	361,670
Multiple Family Residential	0.00	0.00	53.47	996	290 gpd/DU	-	288,710
Innovation	0.00		57.96		2,200 gpd/ac	-	127,506
Commercial	0.00		0.00		2,200 gpd/ac	-	-
Office and Research Park	252.28		0.00		2,200 gpd/ac	555,012	-
Business Park	0.00		0.00		2,200 gpd/ac	-	-
Industrial	0.00		0.00		3,300 gpd/ac	-	-
Civic and Institutional	0.00		0.00		2,200 gpd/ac	-	-
Parks and Open Space	120.95		195.50		0 gpd/ac	-	-
Mixed Use	0.00		0.00		2,200 gpd/ac	-	-
Roads	58.84		58.84		0 gpd/ac	-	-
Total	1,112.12		1,112.12			694,150	895,912

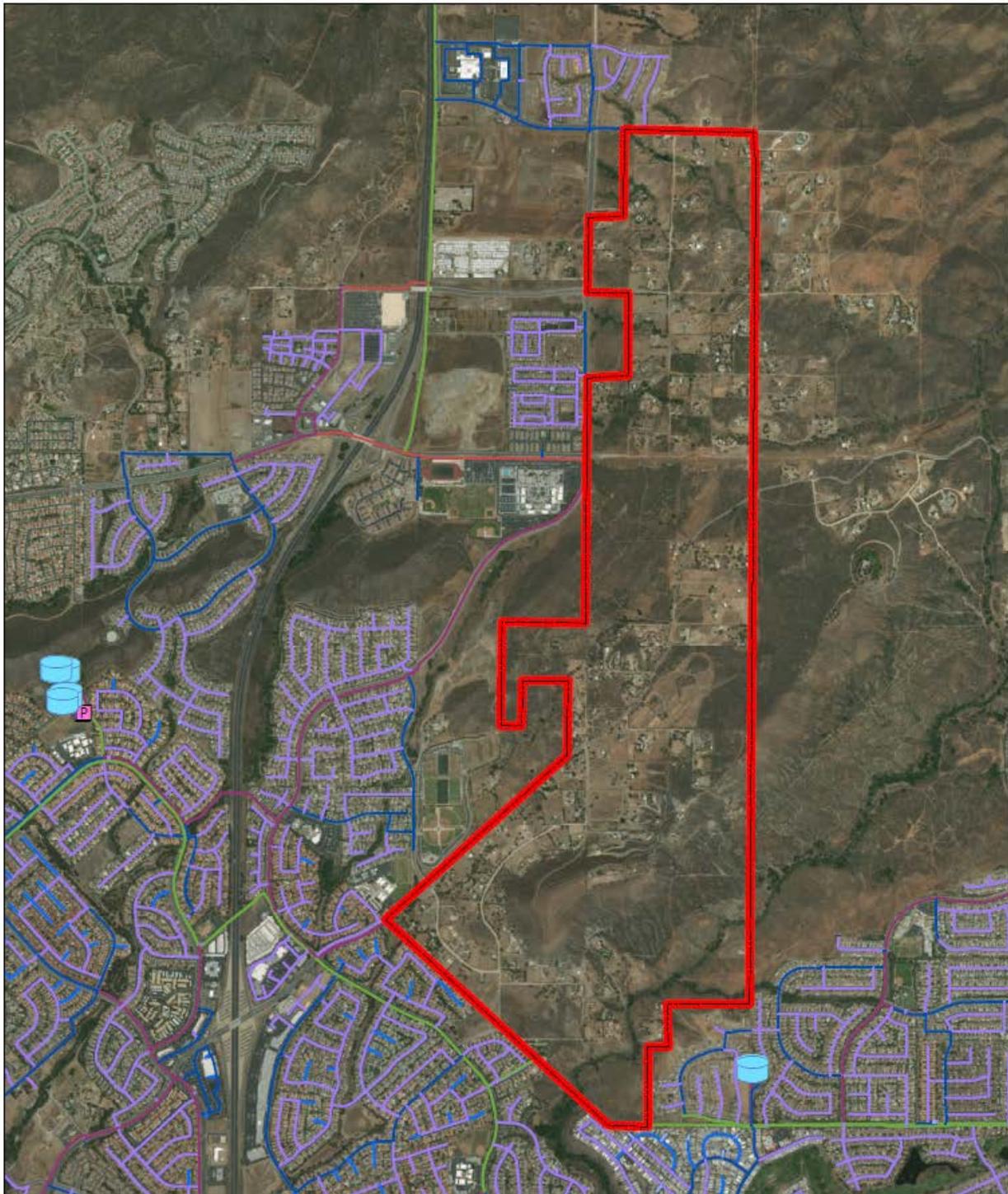
Based on increased Single Family Residential and Multi-Family Residential uses and the reallocation of Office/Research Park uses, the GPU land use changes within the Potential EMWD Annex Area create an increased water demand of approximately 0.2 million gallons per day. However, this area is currently served potable water from groundwater wells and does not rely on agency water facilities. The Potential EMWD Annex Area demand as a whole may be considered an additional demand on the EMWD supply and distribution facilities. Should this area annex into EMWD’s service area, EMWD may request that the development utilize conservation measures in its planning efforts to offset the increased water demand, in the event that the area is not captured in the next 2020 UWMP forecast. On the other hand, the City-wide GPU proposed land use changes result in a decrease in water use, which may be considered as part of the annexation and technical evaluation.

6.2 Facilities Assessment

The Potential EMWD Annex Area is within the EMWD Temecula Valley Service Area and is adjacent to the Murrieta Hot Springs, Las Brisas, and Dutch Village Pressure Zones. Existing potable water lines in the area range from 4 to 20 inches in diameter, as shown in Figure 7. Existing storage and pumping facilities were all found to be adequate in the 2016 WFMP and no fire flow service deficiencies were noted.

Should the Potential EMWD Annex Area develop beyond existing rural densities, a development plan and water system analysis may be requested by EMWD to determine the necessary infrastructure and improvements that may be required to adequately serve the area and/or development project.

Figure 7. Existing EMWD Potable Water Facilities



Legend

Tank	Pump	Pipe Diameter (in)	— 8	— 16	 Annexation Area
		— < 4	— 10	— 18	
		— 6	— 12	— > 20	

6.3 Annexation Process Overview

The following highlights the major agency reviews and resolutions necessary and includes approximate timelines for annexation:

6.3.1 EMWD Staff Reviews

EMWD conducts a review of the Project CEQA documents and files an Environmental Document with the County of Riverside:

- MWD's Plan for Implementing Water Use Efficiency Guidelines
- LAFCO's Plan of Service
- Timeline: 2 to 3 months

6.3.2 EMWD Board Meeting (Public Hearing)

EMWD will hold a Board meeting to adopt a resolution making an application to LAFCO, including ordering the annexation. At the Board meeting EMWD will adopt a resolution requesting MWD's Formal Approval of the annexation. Processing fees will be required as part of submitting for approval from MWD. The following documents are required for the Board resolution:

- MWD's Plan for Implementing Water Use Efficiency Guidelines
- LAFCO's Plan of Service
- Certificate of Assessed Value
- Maps and Legal Description
- Timeline: 2 to 3 months

6.3.3 MWD Board Meeting (Public Hearing)

MWD will hold a Board meeting to adopt a resolution of intent making an application for annexation. The Board approves terms and conditions and adopts resolution of intent to impose standby charges and sends the approved map and legal description to LAFCO for approval. The following documents are required for the MWD Board resolution:

- CEQA Documents
- EMWD's Resolution Requesting MWD's Formal Approval
- Timeline: 2 to 3 months

6.3.4 LAFCO Public Hearing

LAFCO conducts a hearing and adopts a Resolution ordering the annexation based on the following submittals:

- LAFCO Application and Processing Fee
- Environmental Documents
- Plan of Service
- Map and Legal Description (signed by MWD)
- EMWD's Resolution Making Application to LAFCO
- MWD's Plan for Implementing Water Use Efficiency Guidelines
- MWD's Resolution
- Petition
- Assessor's Data
- Timeline: 5 to 6 months

6.3.5 Final EMWD Board Meeting

The final EMWD Board meeting is held to adopt a Resolution approving/finalizing MWD's terms and conditions regarding the annexation. The approximate timeline for this step is 2 months.

Following the final EMWD Board meeting, EMWD will request MWD and State Board of Equalization (SBE) fees from the Property Owner/Subagency. Upon receipt of the fees, EMWD then submits to MWD a MWD acreage charge, a copy of EMWD's Resolution approving the formal terms and conditions, and LAFCO's Resolution ordering the annexation. To LAFCO, EMWD submit the SBE fee and a clearance letter to record the annexation.

LAFCO proceed to record the annexation and issues a Certificate of Completion to EMWD. EMWD submits a copy of the Certificate of Completion to MWD and then updates maps to include the annexation area within its service boundaries.

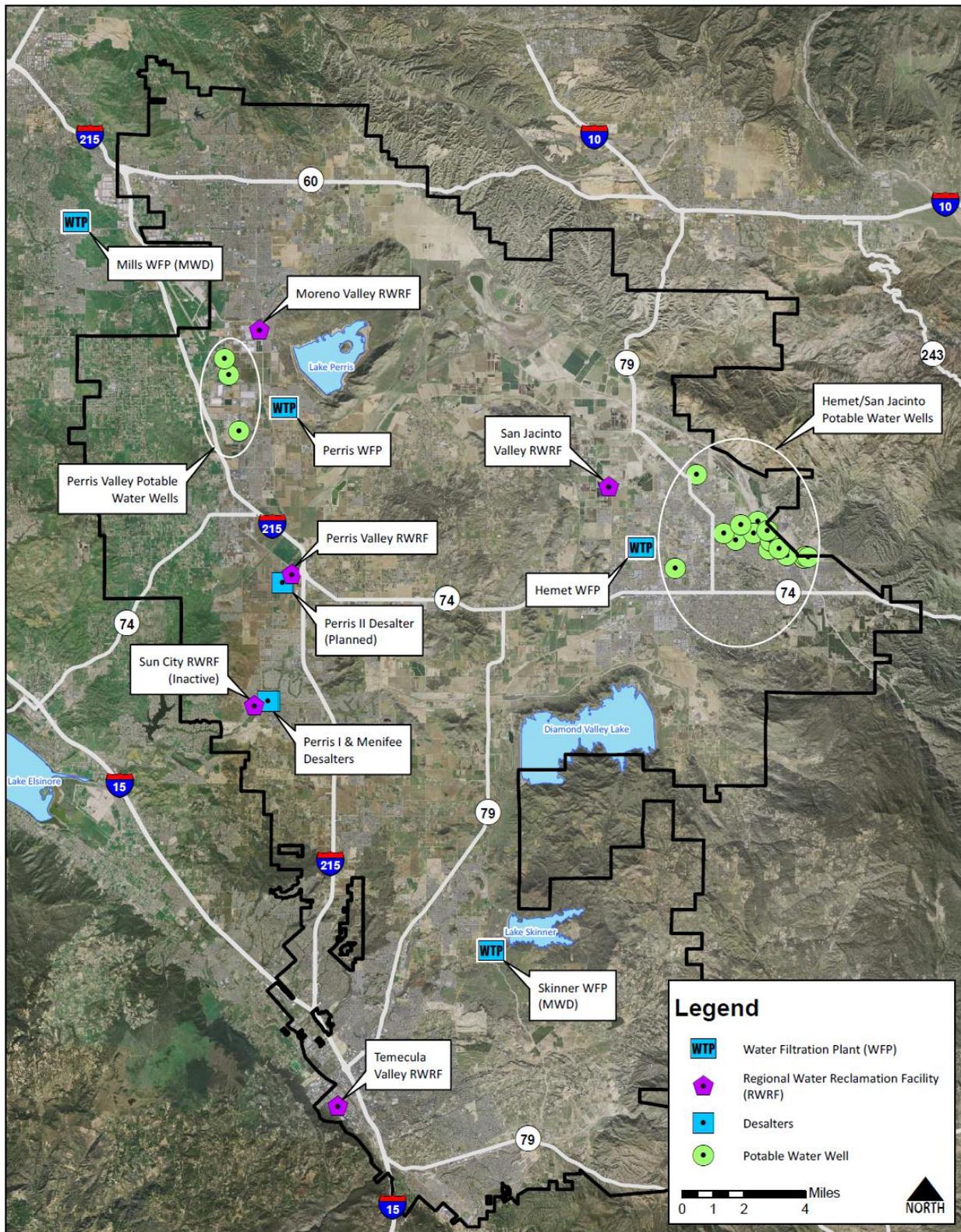
7. Summary of Conclusions

The proposed General Plan Update land use changes do not create an increase in proposed water demands in the City of Murrieta and should not have any impact on existing or proposed EMWD facilities in the Temecula Valley service area. It is recommended that upon adoption of the GPU, the land use information be provided to EMWD for inclusion in the EMWD 2020 UWMP Update, which would then able to document the planned land use changes when submitted, as well as identify potential future EMWD annexation areas in the City.

Appendix A

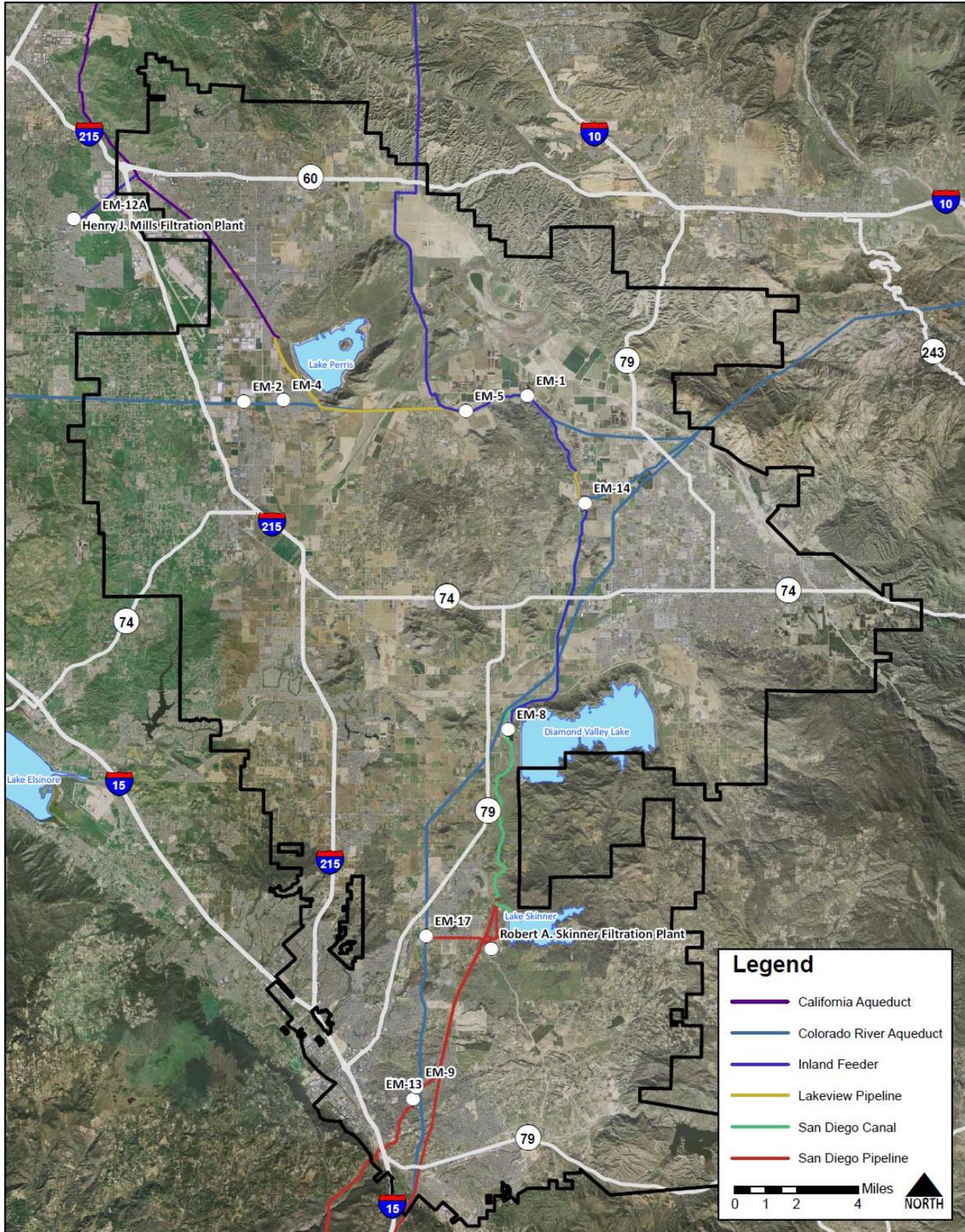
Reference Figures from EMWD 2015 UWMP

Figure 3-2: Location of Treatment and Distribution Facilities in EMWD's Service Area



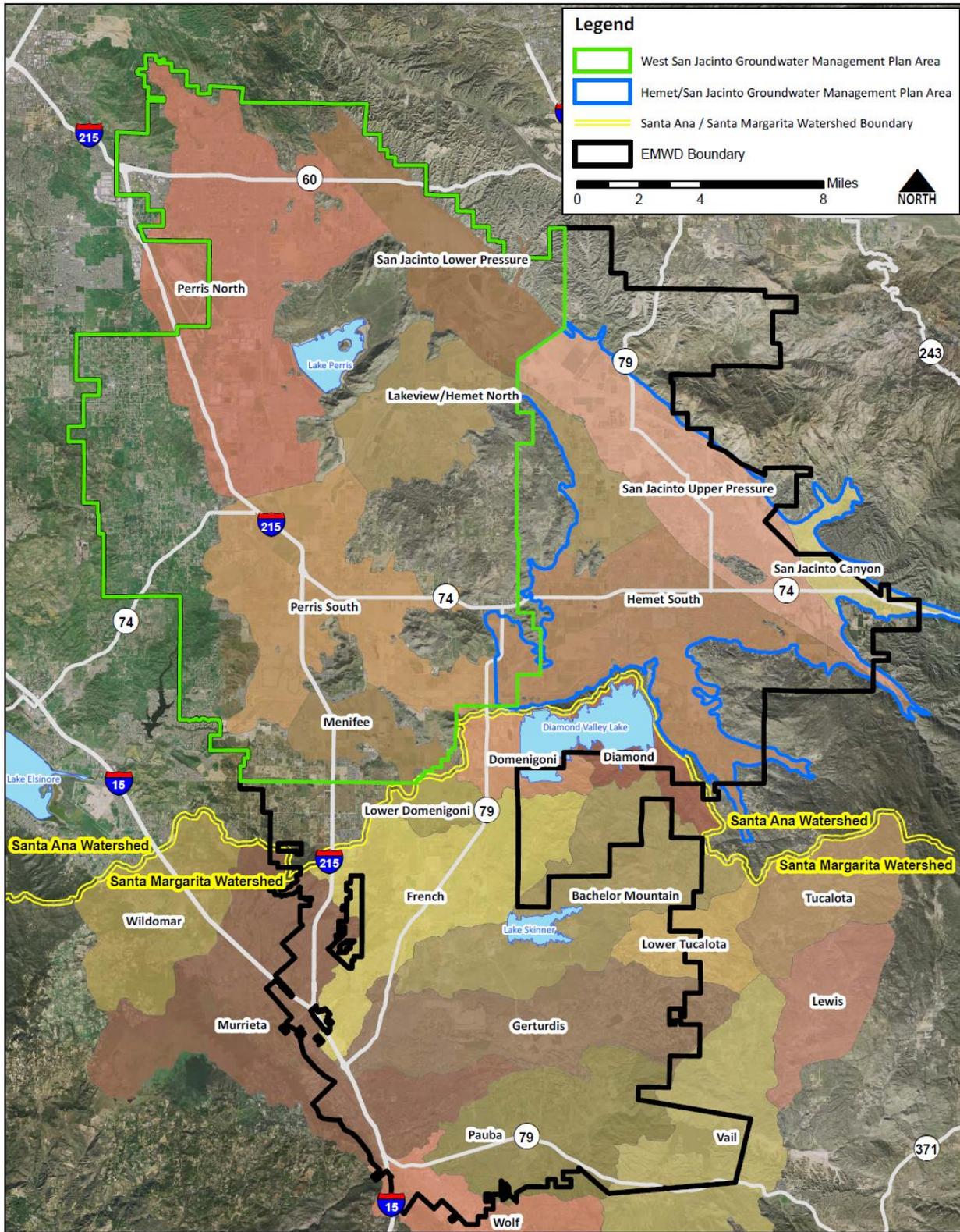
Eastern Municipal Water District
Key Facilities

Figure 6-3: MWD Facilities within EMWD's Service Area



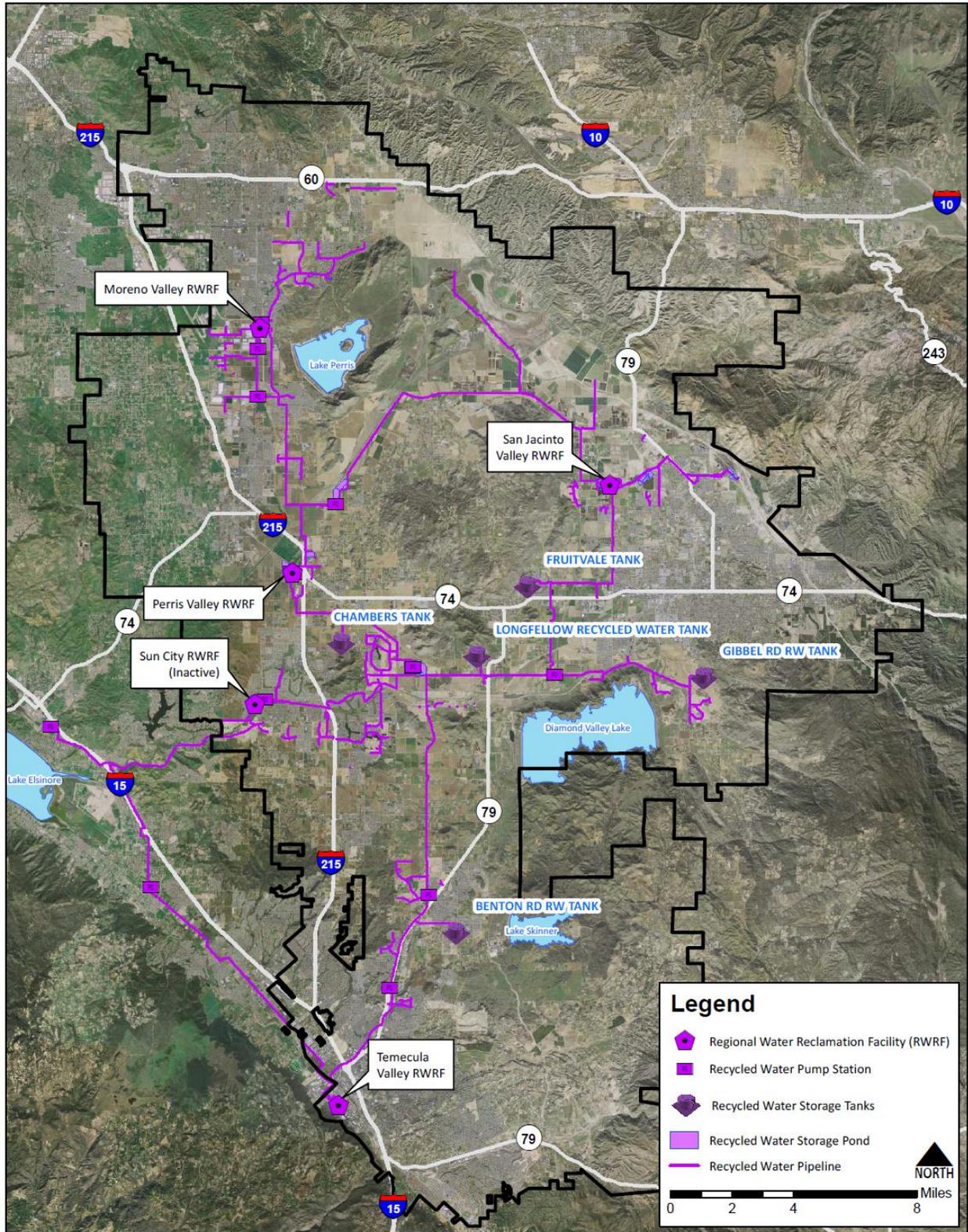
Eastern Municipal Water District
Metropolitan Water District Facilities

Figure 6-4: Groundwater Management Zones



Eastern Municipal Water District
Groundwater Management Zones

Figure 6-5: Key Recycled Water Facilities



Eastern Municipal Water District
Key Facilities - Recycled Water