



Eastern Municipal Water District 2015 Urban Water Management Plan

FINAL

Prepared by



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List of Acronyms and Abbreviations

AB	Assembly Bill
Act	Urban Water Management Planning Act of 1983
AF	acre-feet
AFY	acre-feet per year
AMI	Advanced Metering Infrastructure
AWWA	American Water Works Association
Bay-Delta	San Francisco Bay/Sacramento-San Joaquin Delta
BDCP	Bay Delta Conservancy Plan
BMPs	Best Management Practices
CDFW	California Department of Fish and Wildlife
CFS	Cubic feet per second
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DBPs	Disinfection byproducts
DMM	Demand Measurements Measure
DOE	US Department of Energy
DoF	California Department of Finance
DWR	California Department of Water Resources
ECs	Emerging constituents
EDU	Equivalent Dwelling Unit
EMWD	Eastern Municipal Water District
ERRP	Enhanced Recharge and Recovery Program
ESA	Endangered Species Act
ETAF	Evapotranspiration Adjustment Factor
ETo	Reference Evapotranspiration
EVMWD	Elsinore Valley Municipal Water District
Forum	Colorado River Basin Salinity Control Forum
FY	Fiscal Year
GIS	Geographic Information System
GPCD	gallons per capita per day
gpm	gallons per minute
HECW	High Efficiency Clothes Washers
Hemet/San Jacinto Basin	Hemet/San Jacinto Water Management Plan area
HET	High-Efficiency Toilets
HSJ Management Plan	Hemet/San Jacinto Groundwater Management Area Water Management Plan
IPR	Indirect Potable Recharge
IRP	Integrated Resource Plan

IRRP	Integrated Recharge and Recovery Program
IRWM	Integrated Regional Water Management
LHMWD	Lake Hemet Municipal Water District
MAF	million acre-feet
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
Mills	Henry J. Mills
MOU	Memorandum of Understanding
MFR	Multi-Family Residential
MWD	Metropolitan Water District of Southern California
MWD IRP	Metropolitan Water District of Southern California's Integrated Water Resources Plan
MWEO	Model Water Efficient Landscape Ordinance
NDMA	N-Nitrosodimethylamine
OEHHA	Office of Environmental Health Hazard Assessment
PG&E	Pacific Gas and Electric
PHG	Public Health Goal
PPCPs	Pharmaceuticals and Personal Care Products
QWEL	Qualified Water Efficient Landscaper
RCWD	Rancho California Water District
R&R	Replacement and Refurbishment
RWRF	Regional Water Reclamation Facility
SARCCUP	Santa Ana River Conservation & Conjunctive Use Program
SAWPA	Santa Ana Watershed Planning Authority
SB	Senate Bill
SDCWA	San Diego County Water Authority
SFR	Single Family Residential
Skinner	Robert F. Skinner
SNMP	Salt and Nutrient Management Plan
Soboba Settlement Act	Soboba Band of Luiseño Indians Settlement Act of 2007
Soboba Settlement Agreement	Soboba Band of Luiseño Indians Water Settlement
Soboba Tribe	Soboba Band of Luiseño Indians
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TDS	total dissolved solids
TOC	Total Organic Carbon
µg/L	micrograms per liter
ULFT	Ultra Low-Flush Toilets
USBR	U.S. Department of the Interior, Bureau of Reclamation
USEPA	U.S. Environmental Protection Agency
UWMP	Urban Water Management Plan
VOCs	Volatile organic compounds
Watermaster	Hemet-San Jacinto Watermaster

WBIC	Weather-based irrigation controller
West San Jacinto Basin	West San Jacinto Groundwater Basin Management Plan area
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDMP	Water Surplus and Drought Management Plan
WSEOP	Water Shortage Emergency Operations Plan
WSJ Management Plan	West San Jacinto Groundwater Basin Management Plan
WSO	Water System Optimization
WSS	WaterSense Specified

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Executive Summary

ES-1 Plan Purpose and Overview

The Urban Water Management Planning Act (UWMP Act), adopted in 1983, requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections or supplies more than 3,000 acre-feet of water annually to adopt and submit an Urban Water Management Plan (UWMP) to the California Department of Water Resources (DWR) every five years. The main purpose of developing and updating an UWMP is to forecast water demands and supplies under normal, single-dry, and multiple-dry year conditions; assess supply reliability; and describe methods of reducing demands under potential water shortages.

This 2015 UWMP satisfies the requirements of the UWMP Act and its amendments, and provides an overview of Eastern Municipal Water District's (EMWD)'s long-term supplies and demands. The 2015 UWMP also reports EMWD's progress towards meeting the water use efficiency targets set by the Water Conservation Act of 2009 (SBx7-7).

In addition to significant conservation efforts made since the enactment of SBx7-7, the 2015 UWMP also documents EMWD's significant per capita water use reduction as a result of emergency requirements set by the State Water Resources Control Board (SWRCB). In response to California Governor Brown's April 2014 Proclamation declaring severe drought conditions in the state of California, the SWRCB has required water suppliers to reduce water usage statewide. EMWD was assigned a required demand reduction of 28 percent relative to 2013 water usage. This 2015 UWMP documents EMWD's significant per capita water use reduction in response to the SWRCB's water conservation requirements.

Table ES-1 summarizes the information contained within EMWD's 2015 UWMP.

Table ES-1: Organizational Overview of the 2015 UWMP

Chapter Name	Information Contained within Chapter
Chapter 1 – Introduction and Overview	<ul style="list-style-type: none"> General legal requirements for 2015 UWMPs Local planning efforts
Chapter 2 – Plan Preparation	<ul style="list-style-type: none"> Plan preparation Agency coordination and outreach
Chapter 3 – System Description	<ul style="list-style-type: none"> General description of EMWD's retail and wholesale service areas Description of EMWD's distribution systems Climate characteristics of EMWD's service area Current and projected population and demographic figures
Chapter 4 – System Water Use	<ul style="list-style-type: none"> Overview of past, current, and projected water use System water losses Climate change impacts on water use
Chapter 5 – Baselines and Targets	<ul style="list-style-type: none"> Information on the Water Conservation Act of 2009 Baseline gross per capita water use Updated water use targets for 2015 and 2020 2015 target compliance confirmation

Chapter Name	Information Contained within Chapter
Chapter 6 – System Supplies	<ul style="list-style-type: none"> • Information about current and projected supplies • Background on imported water supply, including the Metropolitan Water District of Southern California • Description of groundwater basin management and supplies • Description of EMWD's recycled water system and the beneficial uses of recycled water • Description of planned water projects • Climate change impacts to supplies
Chapter 7 – Water Supply Reliability Assessment	<ul style="list-style-type: none"> • Overview of the reliability of each of EMWD's supplies • Water quality of supplies • Projections for water supply and water demands under normal, single dry, and multiple dry year hydrologic conditions • Regional supply reliability
Chapter 8 – Water Shortage Contingency Planning	<ul style="list-style-type: none"> • Overview of EMWD's water shortage stages and associated prohibitions for each stage • Methods for reducing water use • Minimum supply available for the next three years
Chapter 9 – Demand Management Measures	<ul style="list-style-type: none"> • Overview of the California Urban Water Conservation Council • Summary of EMWD's retail and wholesale demand management measures
Chapter 10 – Plan Adoption, Submittal, and Implementation	<ul style="list-style-type: none"> • Overview of the UWMP adoption process • Implementation of the 2015 Plan

ES-2 Service Area and Water Supplies

EMWD provides potable water, recycled water, and wastewater services to an area of approximately 555 square miles in western Riverside County. EMWD is both a retail and wholesale agency, serving a retail population of 546,146 people and a wholesale population of 215,075 people. The agency was initially formed in 1950 to bring imported water to the area and in 1951 was annexed into the Metropolitan Water District of Southern California (MWD). EMWD is now one of MWD's 26 member agencies.

The majority of EMWD's supplies are imported water purchased through MWD from the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Imported water is delivered to EMWD either as potable water treated by MWD, or as raw water that EMWD can either treat at one of its two local filtration plants or deliver as raw water for non-potable uses.

EMWD's local supplies include groundwater, desalinated groundwater, and recycled water. Groundwater is pumped from the Hemet/San Jacinto and West San Jacinto areas of the San Jacinto Groundwater Basin. Groundwater in portions of the West San Jacinto Basin is high in salinity and requires desalination for potable use. EMWD owns and operates two desalination plants that convert brackish groundwater from the West San Jacinto Basin into potable water. EMWD also owns, operates, and maintains its own recycled water system that consists of four Regional Water Reclamation Facilities and several storage ponds spread throughout EMWD's service area that are all connected through the recycled water system. As of 2014, EMWD has used 100 percent of the recycled water it produces.

ES-3 Water Demands

Since its formation as a water agency, EMWD has shifted from primarily serving agricultural uses to primarily serving urban uses. Today, EMWD's retail customers are mostly residential, with other uses consisting of commercial, industrial, institutional, landscape and agricultural. In addition to retail potable water demand, EMWD delivers water to seven wholesale customer agencies and meets a significant portion of demand with recycled water.

In 2015, the SWRCB in its Emergency Regulation required water suppliers to reduce water usage by 25 percent statewide as a means of reducing stress on California's water supplies during the ongoing drought. The mandatory water restrictions required EMWD to implement Stage 4 of its Water Shortage Contingency Plan (WSCP) to meet conservation targets which helped EMWD reduce demands in 2015 by over 20 percent.

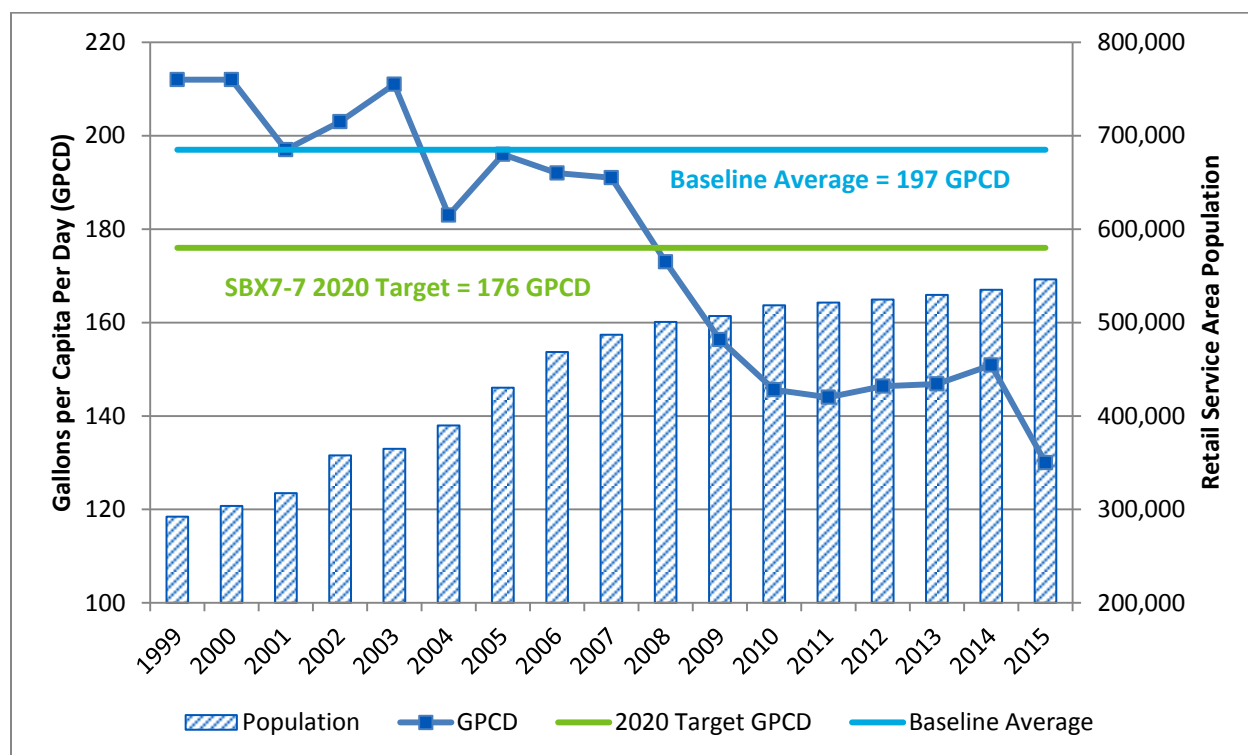
Demand projections for EMWD were developed using information about planned development and land use. These future demand projections assume the return of typical hydrologic conditions during the planning horizon that will allow a relaxation of the SWRCB's Emergency Regulation requirements. Although development has slowed in recent years, growth is expected to increase as the overall economy grows. EMWD's retail and wholesale demand projections for its potable and non-potable systems are presented in Table ES-2.

Table ES-2: Total Demand Projections

	2015	2020	2025	2030	2035	2040
Retail Potable and Raw Water Demand	78,937	100,500	111,500	122,900	134,000	144,500
Wholesale Potable and Raw Water Demand	21,768	50,500	54,100	57,700	61,200	64,800
Total Potable and Raw Water Demand	100,705	151,000	165,600	180,600	195,200	209,300
Retail Recycled Water Demand	44,150	45,245	48,334	50,017	51,800	53,300
Wholesale Recycled Water Demand	1,235	1,656	4,766	5,183	5,600	5,600
Total Recycled Water Demand	45,385	46,901	53,100	55,200	57,400	58,900
Total Water Demand	146,090	197,901	218,700	235,800	252,600	268,200

As part of this UWMP, EMWD was required to update its baseline and target per capita water use numbers in compliance with SBx7-7. The overall goal of SBx7-7 is to reach a 20 percent statewide reduction of per capita urban water use by 2020. EMWD established a 10-year baseline period from 1999 to 2008 with a baseline water usage of 197 gallons per capita per day (GPCD). The 2020 target was calculated using DWR's Method 2, which uses an efficiency standard with targets for indoor use, landscape use, and commercial, industrial and institutional use and an optional target for agricultural use. EMWD's 2020 target was set at 176 GPCD, with a 2015 interim target of 187 GPCD. EMWD's actual 2015 per capita water use was calculated as 129 GPCD, well below the 2015 interim target. EMWD anticipates that even if demands increase when regulations are lifted, it will still meet its 2020 compliance target. Figure ES-1 illustrates EMWD's progress toward meeting its conservation target.

Figure ES-1: Progress Toward Meeting SBx7-7 Targets



ES-4 Water Supply Forecast

EMWD plans to meet increases in projected demands through a combination of local supply development and ongoing water conservation. EMWD is in the process of completing master planning documents that investigate optimal supply portfolios to meet the agency's needs. Future supply projects described in this 2015 UMWP include: continuing full utilization of recycled water, expansion of the desalter program, increasing local groundwater banking, and developing additional regional water transfers and exchanges. Reasonably available volumes from local supply development were incorporated into EMWD's supply projections, and are presented in Table ES-3.

Table ES-3: Total Retail and Wholesale Water Supply (AFY)

Supply	2015	2020	2025	2030	2035	2040
Retail						
Imported Water	56,397	81,197	89,097	100,497	111,597	122,097
Groundwater	15,252	12,303	12,303	12,303	12,303	12,303
Desalinated Groundwater	7,288	7,000	10,100	10,100	10,100	10,100
Recycled Water	44,150	45,245	48,334	50,017	51,800	53,300
Total Retail Supply	123,087	145,745	159,834	172,917	185,800	197,800
Wholesale						
Imported Water	21,768	50,500	54,100	57,700	61,200	64,800
Recycled Water	1,235	1,656	4,766	5,183	5,600	5,600
Total Wholesale Supply	23,003	52,156	58,866	62,883	66,800	70,400
Total Water Supply	146,090	197,901	218,700	235,800	252,600	268,200

ES-5 Supply Reliability and Contingency Planning

EMWD will continue to rely on imported water from MWD as the main source of supply for its retail and wholesale customers, yet recognizes the need to increase local supplies and water conservation to manage supply and demand. MWD evaluated challenges to supply reliability in its 2015 UWMP, including drought conditions, environmental regulations, water quality concerns, and infrastructure vulnerability. MWD has undertaken several planning initiatives to assess and prepare for vulnerabilities including its Integrated Water Resources Plan, its Water Surplus and Drought Management Plan, and its Water Supply Allocation Plan (WSAP). Additionally, MWD has developed dry-year storage through groundwater and surface water reservoirs that help meet dry-year demands. Based on the information provided in MWD's 2015 UWMP, MWD has sufficient supply capabilities to meet the expected demands of its member agencies from 2020 through 2040 under normal, historic single-dry and historic multiple-dry year conditions.

EMWD recognizes that recent and ongoing dry conditions have impacted the reliability of the SWP and CRA imported supplies, causing significant withdrawals from MWD's storage reservoirs during the last few years. If another multiple-dry year period were to occur over the next three years, MWD could face supply shortages. EMWD is able to respond to supply shortages through implementation of its WSCP and MWD's WSAP. EMWD has the ability to meet current and projected water demands through 2040 under normal, historic single-dry and historic multiple-dry year conditions using a combination of imported water from MWD and existing local supply resources. Table ES-4 and Table ES-5 demonstrate the supply-demand balance for EMWD's service area under single-dry and multiple-dry hydrologic scenarios.

Table ES-4: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035	2040
Retail					
Supply totals	166,300	182,400	197,400	212,000	225,700
Demand totals	166,300	182,400	197,400	212,000	225,700
Difference	0	0	0	0	0
Wholesale					
Supply totals	58,500	66,200	70,700	75,200	79,300
Demand totals	58,500	66,200	70,700	75,200	79,300
Difference	0	0	0	0	0

Table ES-5: Multiple Dry Year Supply and Demand Comparison

		2020	2025	2030	2035	2040
Retail						
First year	Supply totals	166,300	182,400	197,400	212,000	225,700
	Demand totals	166,300	182,400	197,400	212,000	225,700
	Difference	0	0	0	0	0
Second year	Supply totals	142,500	155,400	167,400	179,000	190,100
	Demand totals	142,500	155,400	167,400	179,000	190,100
	Difference	0	0	0	0	0
Third year	Supply totals	149,500	162,700	175,100	186,900	198,600
	Demand totals	149,500	162,700	175,100	186,900	198,600
	Difference	0	0	0	0	0
Wholesale						
First year	Supply totals	58,500	66,200	70,700	75,200	79,300
	Demand totals	58,500	66,200	70,700	75,200	79,300
	Difference	0	0	0	0	0
Second year	Supply totals	48,500	54,700	58,200	61,700	64,900
	Demand totals	48,500	54,700	58,200	61,700	64,900
	Difference	0	0	0	0	0
Third year	Supply totals	52,000	57,400	61,100	64,600	68,000
	Demand totals	52,000	57,400	61,100	64,600	68,000
	Difference	0	0	0	0	0

Chapter 1 Introduction and Overview

1.1 Background and Purpose

The Urban Water Management Planning Act (Act), adopted in 1983, requires water suppliers to conduct long-term water resources planning. Prior to adoption of the Act, water agencies were more vulnerable to supply disruptions during periods of drought or supply shortages. The Act sought to minimize susceptibility to supply shortages by requiring a minimum level of long-term resource assessment and planning by water suppliers. The planning requirements established by the Act and subsequent legislation encourage regional coordination and focus on water use efficiency as described in the sections below. This 2015 Urban Water Management Plan (UWMP) addresses the water supply sources, projected demands, and supply reliability for Eastern Municipal Water District's (EMWD) service area.

1.2 Urban Water Management Planning Act and the California Water Code

California Water Code (CWC) 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 forth in Article 3 (commencing with Section 10640)". These plans are to be updated every five years and submitted to the California Department of Water Resources (DWR). Requirements for the UWMP 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, in the event of a water shortage
- Comparison of demand and supply projections

In November of 2009, the State legislation passed Senate Bill (SB) 7 as part of the Seventh Extraordinary Session, referred to as SBx7-7 or the Water Conservation Act of 2009. SBx7-7 sets the goal of achieving a 20 percent reduction in urban per capita water use statewide by 2020. Retail water agencies are required to set targets and track progress toward decreasing daily per capita urban water use in their service areas, which will assist the State in meeting its 20 percent reduction goal by 2020. This law requires that every UWMP include:

- Baseline per capita water use
- Urban water use target for 2020
- Interim urban water use target for 2015
- Compliance daily per capita water use

This 2015 UWMP has been prepared to comply with the Urban Water Management Planning Act and SBx7-7. In addition to meeting the requirements of the Act, this report will be used to support water supply assessments and written verifications of water supply required by SB 610 and SB 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size, prior to discretionary project approval. Both bills allow an UWMP to be used as a source document to fulfill these legislative requirements.

Since 2010, several amendments have been added to the Act. These include requirements for: describing the water supplier's Demand Management Measures and establishing a submittal date to DWR of July 1, 2016 (Assembly Bill (AB) 2067, 2014); analyzing and defining water features that are artificially supplied with water (AB 2409, 2010); submitting the plan electronically, using standardized tables and

forms, quantifying and reporting distribution system water losses, and guidance for voluntary reporting of passive water savings (SB 1420, 2014); and guidance for voluntary reporting of energy intensity (SB 1036, 2014). This 2015 UWMP was developed to incorporate these new requirements, under the guidance of DWR's 2015 UWMPs Guidebook for Urban Water Suppliers. A checklist to document compliance of this 2015 UWMP with the Act and the CWC is provided in Appendix A.

This UWMP includes all required DWR standardized tables within relevant chapters and they are compiled in Appendix B. Within the UWMP chapters, DWR's standardized tables include the DWR-assigned table number in the first row of the table. This 2015 UWMP also includes all required SBx7-7 tables in Appendix C to verify compliance with the SBx7-7 targets.

1.3 Urban Water Management Plans in Relation to Other Planning Efforts

UWMPs allow for integration of information from other planning documents, as well as regional planning efforts. EMWD has recently completed, or is about to complete, a number of planning documents that were used to inform estimates of water supplies and water use projections for the 2015 UWMP update. Additionally, regional planning efforts conducted by Metropolitan Water District of Southern California (MWD) were used to assess the EMWD imported water supply reliability. Relevant planning documents are summarized in Table 1-1 below.

Table 1-1: Planning Documents in Relation to the 2015 UWMP

Planning Document	Summary
Water Master Plan, EMWD 2016	This document analyzes EMWD's facilities needs to meet current and future customer demands.
Recycled Water Strategic and Master Plan, EMWD 2016	The document analyzes EMWD's recycled water opportunities and contains recycled water projections through the year 2045, including descriptions of planned recycled water projects and facilities.
Wastewater Collection Master Plan, EMWD 2016	This document analyzes EMWD's facilities needs to collect existing and future wastewater.
Regional Water Reclamation Facilities Master Plan	This document analyzes EMWD's reclamation facility needs for treating existing and future wastewater.
Integrated Resources Plan, MWD 2015	The document describes MWD's plan for providing adequate and reliable supplies to member agencies and is used as the basis for MWD's 2015 UWMP.
2015 Urban Water Management Plan, MWD	The document describes MWD's demand and supply reliability and is used as the basis EMWD's imported water supply reliability.

Chapter 2 Plan Preparation

2.1 Basis for Preparing the Plan

EMWD operates a Public Water System that qualifies as an “Urban Water Supplier” under the CWC Section 10617, serving more than 3,000 customers and more than 3,000 acre-feet per year (AFY). Table 2-1 provides qualifying information about EMWD, as required in the 2015 UWMP Guidebook.

Table 2-1: Retail Public Water System

DWR Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015 ¹	Volume of Water Supplied 2015 (AFY)
CA3310009	Eastern Municipal Water District	147,300	78,937
Total		147,300	78,937

1) The number of connections and volume of water supplied in this table reflect EMWD's potable water system only. Recycled water connections (500) and volume supplied (44,150 AF) in 2015 is not included.

For the 2015 update of the UWMP, an individual plan was prepared in coordination with the appropriate regional agencies and constituents. The plan will report solely on the EMWD service area and will address all the requirements of the CWC. Table 2-2 documents the Plan Identification for EMWD's 2015 update of the UWMP.

Table 2-2: Plan Identification

DWR Table 2-2: Plan Identification	
	Type of Plan
<input checked="" type="checkbox"/>	Individual UWMP
<input type="checkbox"/>	Regional UWMP

EMWD is both a retail and wholesale Urban Water Supplier and has selected to report UWMP data in calendar years and in units of acre-feet (AF). Table 2-3 documents the Agency Identification for the update of the 2015 UWMP.

Table 2-3: Agency Identification

DWR Table 2-3: Agency Identification	
	Type of Agency
<input checked="" type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
	Fiscal or Calendar Year
<input checked="" type="checkbox"/>	UWMP Tables Are in Calendar Years
<input type="checkbox"/>	UWMP Tables Are in Fiscal Years
	Units of Measure Used in UWMP
Unit	AF

2.2 Coordination and Outreach

As noted in Section 2.1, EMWD is both a retail and wholesale agency. As a retail agency, EMWD is required to provide its wholesaler, MWD, with projected water demand in five-year increments for 20 years. As a wholesale agency, EMWD is required to provide information to its customer urban water suppliers identifying and quantifying water supplies available to those agencies in five-year increments. Table 2-4 and Table 2-5 list the wholesale and retail agencies, respectively, that EMWD exchanged water supplier information with for the development of the 2015 UWMPs.

Table 2-4: Retail Water Supplier Information Exchange

DWR Table 2-4 Retail: Water Supplier Information Exchange	
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.	
Wholesale Water Supplier Name	
Metropolitan Water District of Southern California	

1) EMWD participated in the development of the 2015 MWD IRP Update and the MWD 2015 UWMP

Table 2-5: Wholesale Water Supplier Information Exchange

DWR Table 2-4 Wholesale: Water Supplier Information Exchange	
<input checked="" type="checkbox"/>	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631.
Water Supplier Name	
City of Hemet	
City of Perris	
City of San Jacinto	
Lake Hemet Municipal Water District	
Nuevo Water Company	
Rancho California Water District	
Western Municipal Water District	

Article 3, Section 10642 of the UWMP Act requires each urban water supplier to 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 Table 2-6.

Table 2-6: Coordination for UWMP Preparation

Organization/ Agency Name	Participated in Developing the UWMP	Was Contacted for Assistance	Was Sent a Notification of 2015 UWMP Preparation	Attended Public Meetings	Was Sent a Copy of the 2015 UWMP
Metropolitan Water District of Southern California	✓	✓	✓		✓
Lake Hemet Municipal Water District	✓	✓	✓		✓
City of Hemet	✓	✓	✓		✓
City of Temecula			✓		✓
City of Murrieta			✓		✓
City of San Jacinto	✓	✓	✓		✓
City of Perris	✓	✓	✓		✓
Rancho California Water District	✓	✓	✓		✓
Nuevo Water Company	✓	✓	✓		✓
City of Menifee			✓		✓
County of Riverside			✓		✓
General Public				✓	✓

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Chapter 3 System Description

3.1 Eastern Municipal Water District

EMWD is a public water agency formed in 1950 by popular vote. In 1951, it was annexed into the MWD and gained access to a supply of imported water from the Colorado River Aqueduct (CRA). Today, EMWD remains one of MWD's 26 member agencies and receives water from Northern California through the State Water Project (SWP) in addition to 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's list of services has evolved to include groundwater production, desalination, water filtration, wastewater collection and treatment, and regional water recycling. EMWD provides both retail and wholesale water service covering a total population of over 750,000. EMWD's mission is "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 member appointed to the MWD Board.

3.2 Service Area Physical Description

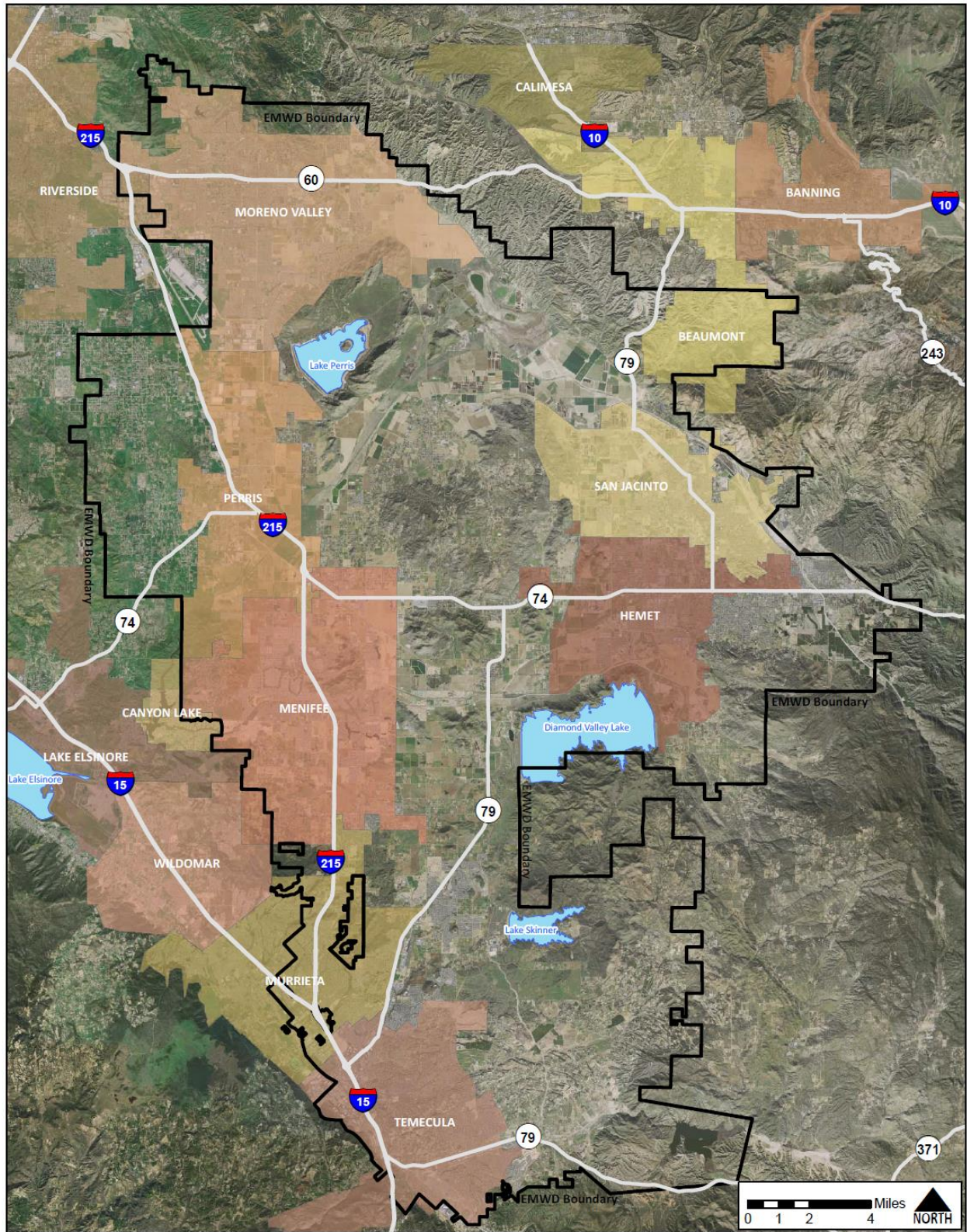
EMWD is located in western Riverside County, approximately 75 miles east of Los Angeles. The 555 square mile service area includes seven incorporated cities in addition to unincorporated areas in the County of Riverside.

The cities and unincorporated areas within EMWD's boundary include:

- City of Hemet
- City of Menifee
- City of Moreno Valley
- City of Murrieta
- City of Perris
- City of San Jacinto
- City of Temecula
- Homeland
- Lakeview
- Nuevo
- Quail Valley
- Romoland
- 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 purveyor agency. EMWD's service area boundary and the cities within that boundary are shown in Figure 3-1.

Figure 3-1: Areas Within EMWD Boundaries



Eastern Municipal Water District
Cities

EMWD is a wholesale potable provider to the following agencies:

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

Additionally, EMWD sells recycled water to RCWD and Elsinore Valley Municipal Water District (EVMWD) and has an emergency connection with the City of Perris' North Perris Water System.

Several of these agencies have prepared or will prepare their own UWMP. EMWD has discussed and reviewed the supplemental water demands required by each agency with representatives of those agencies. The demand and water supply requirements are discussed in this UWMP.

3.3 Treatment and Distribution Systems

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.

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 Robert F. Skinner (Skinner) Water Treatment Plant 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.

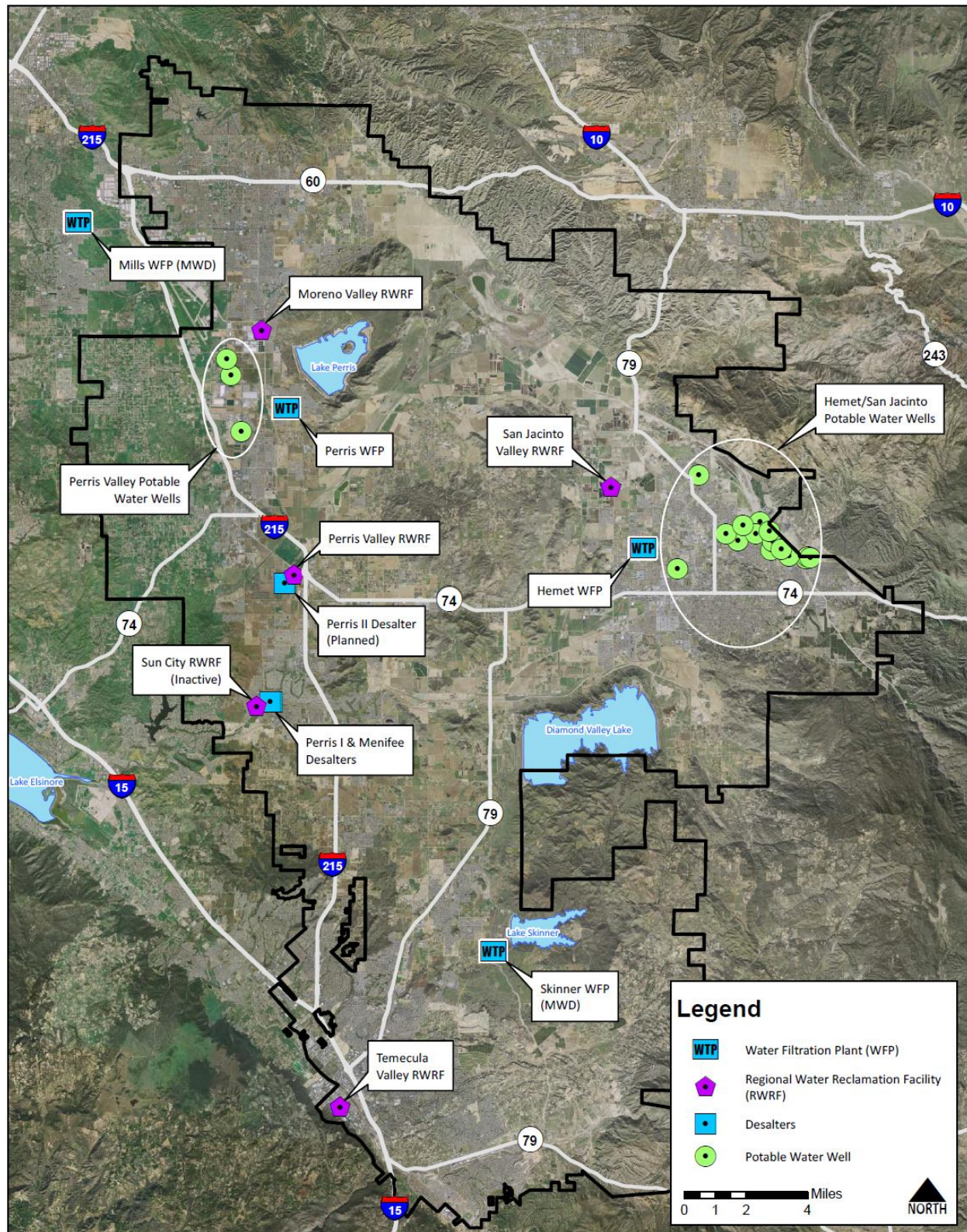
EMWD owns and operates two microfiltration plants that filter raw imported water delivered through MWD, removing particulate contaminants to achieve potable water standards. The two treatment plants, the Perris Water Filtration Plant and the Hemet Water Filtration Plant, are located in Perris and Hemet, respectively. Raw water from MWD is also used for groundwater replenishment in the eastern part of EMWD. EMWD and others can extract this water at a later date for beneficial uses. Untreated water from MWD used for agricultural purposes is delivered in the northeast for use by EMWD retail and wholesale accounts and in the south for RCWD agricultural accounts.

EMWD produces potable and brackish groundwater from the San Jacinto Groundwater Basin that underlies the EMWD service area. Groundwater wells are mostly located within the San Jacinto Watershed and serve the northern portion of EMWD, with the largest amount of production taking place around the cities of Hemet and San Jacinto. EMWD owns and operates two desalination plants in Sun City, the Menifee Desalter and the Perris I Desalter, which treat brackish groundwater through reverse osmosis to achieve potable water standards.

In addition to the potable 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.

EMWD's water supplies and facilities are described in more detail in *Chapter 6 – System Supplies*. The location of EMWD's treatment and distribution facilities are shown in Figure 3-2.

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



3.4 Climate

EMWD has a semi-arid climate characterized by hot, dry summers and cooler winters. The region experiences a wide variation in rainfall and periodic drought. The average total rainfall in the service area is approximately 7.6 inches, occurring mostly December through March. Table 3-1 provides a summary of average reference evapotranspiration (ET_o), temperature and precipitation for EMWD's service area taken from the California Irrigation Management Information System (CIMIS) Winchester-179 local climate station between the years 2002 and 2015.

Table 3-1: EMWD Climate

	Standard Monthly Average Eto (inches)	Average Rainfall (inches)	Average Max Temperature (Fahrenheit)	Average Min Temperature (Fahrenheit)
January	2.29	1.16	67.12	33.96
February	2.69	1.78	66.67	35.42
March	4.29	0.83	70.22	38.89
April	5.18	0.51	72.79	42.18
May	6.55	0.24	77.48	47.75
June	7.17	0.01	84.93	52.84
July	7.85	0.30	92.26	59.48
August	7.64	0.10	93.33	58.70
September	6.21	0.20	91.33	56.23
October	4.21	0.41	80.40	47.89
November	2.70	0.57	72.70	39.51
December	2.04	1.51	64.16	33.71
Total / Average	58.82	7.60	77.78	45.55

California is currently experiencing a historic drought with record high temperatures and limited rainfall. Through 2014, EMWD saw an increase in demand corresponding to these two factors. On April 1, 2015, California Governor Brown directed the State Water Resources Control Board (SWRCB) to require water suppliers to reduce water usage by 25 percent statewide as a means of reducing stress on California water supplies during the drought. Mandatory water use reduction targets for each water provider were determined by the SWRCB, and EMWD was assigned a water use reduction target of 28 percent. The mandatory water restrictions required EMWD to implement Stage 4 of its Water Shortage Contingency Plan (WSCP) to meet conservation targets. EMWD customers responded with a 20 percent reduction in demand. EMWD's WSCP and water use prohibitions are described in *Chapter 8 – Water Shortage Contingency Planning*.

3.5 Population

Through the past decade, EMWD's service area was one of the fastest growing regions in California. Since 1990, more than 350,000 people have been added to the service area, doubling the population. Table 3-2 summarizes EMWD's historical retail and wholesale service populations.

The population within EMWD's retail service area represents the area directly served by EMWD's distribution system. Population for EMWD's retail and wholesale service areas has been calculated based on data available from the 1990, 2000, and 2010 Censuses. Previous estimates included in the 2010 UWMP from the Riverside County Center for Demographics research underestimated EMWD's service area population for 2010. For this 2015 UWMP, the final 2010 Census data were used to recalculate

EMWD's retail and wholesale populations. DWR's Population Tool was used to estimate EMWD's historical retail population as described in Section 5.4. California Department of Finance (DoF) growth projections were used in combination with Census data and Geographic Information System (GIS) software to estimate historical population for EMWD's wholesale service area.

Table 3-2: Historical Population within EMWD's Boundary – 1990 – 2010

Water Service Area	1990	1995	2000	2005	2010
EMWD Retail Service Area ¹	240,293	277,013	297,111	430,314	519,880
EMWD Wholesale Service Area ^{2,3}	102,362	134,932	167,104	185,420	200,789
Total	342,655	411,945	464,215	615,734	720,669

1) Retail population was estimated using Census data and DWR's Population Tool.

2) Wholesale population for 2005 was interpolated based on California Department of Finance growth estimates.

3) Wholesale population for 2010 was estimated using 2010 Census tracts and GIS.

3.5.1 Current and Projected Population

To ensure that planning efforts for future growth are comprehensive, EMWD incorporates regional projections in its UWMP. The 2015 populations for EMWD and its sub agencies were primarily estimated using data from the 2014 American Community Survey at the Census tract level. An overlay of the Census tracts and the respective agency service areas in GIS was used to attribute populations to each agency. Projections for the remainder of the planning period (2020 – 2040) were prepared based on EMWD's proposed development projects and land uses within EMWD's borders as well as current demographic information such as household size. Table 3-3 and Table 3-4 show EMWD's current and projected retail and wholesale populations, respectively.

Table 3-3: Retail Population – Current and Projected

DWR Table 3-1 Retail: Population - Current and Projected						
Population Served ^{1,2}	2015	2020	2025	2030	2035	2040
	546,146	617,100	699,800	784,100	864,200	939,100

1) Retail population for 2015 was estimated using a SWRCB reporting method using 2010 Census data and the American Community Survey for 2014. DWR pre-approved EMWD's methodology for estimating population.

2) Retail population projections for 2020-2040 were estimated using EMWD's Database of Proposed Projects and the 2015 SWRCB estimated population. DWR pre-approved EMWD's methodology for estimating population.

Table 3-4: Wholesale Population –Current and Projected

DWR Table 3-1 Wholesale: Population - Current and Projected						
Population Served ^{1,2}	2015	2020	2025	2030	2035	2040
	215,075	239,400	267,300	291,100	314,400	335,500

1) Wholesale population for 2015 was estimated using GIS and 2010 Census tract data.

2) Wholesale population projections for 2020-2040 were estimated using EMWD's Database of Proposed Projects and the 2015 population. DWR pre-approved EMWD's methodology for estimating population.

3.6 Other Demographic Factors

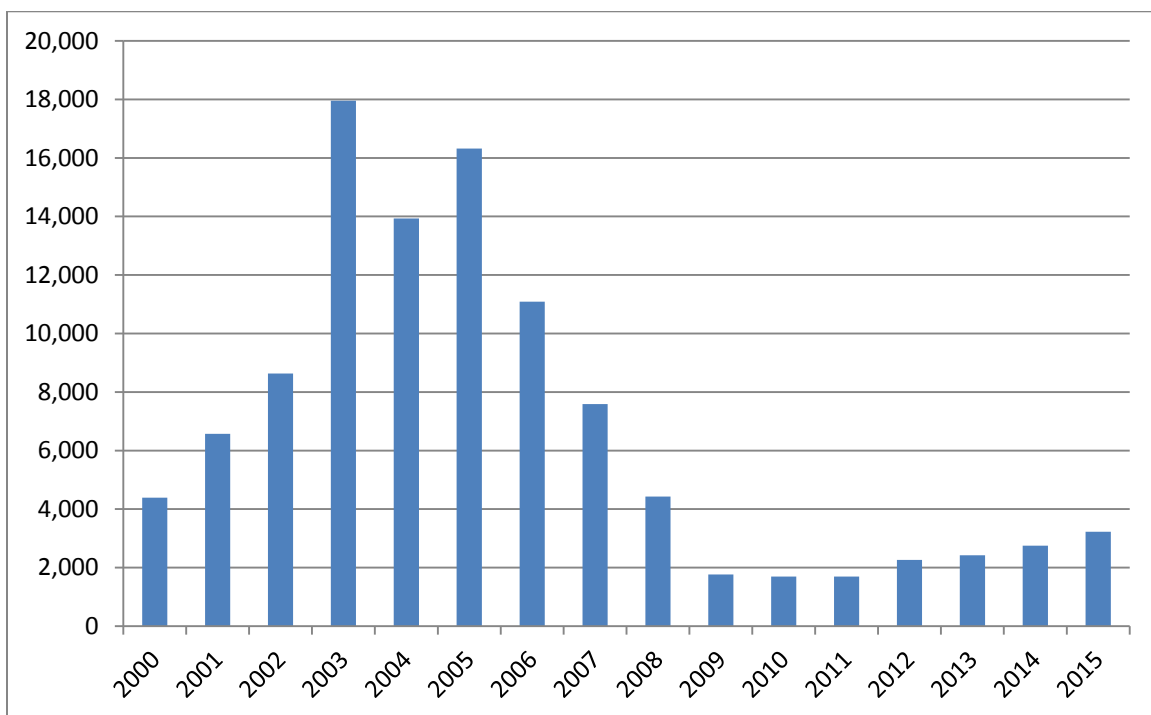
As the population within EMWD's service area continues to grow, the characteristics of the service area are continually changing. Tract homes, commercial centers and new industrial warehouses are replacing areas of agriculture and vacant land. Over the next 25 years, EMWD's total population is projected to grow by over 500,000 people, a 67 percent increase over the current population.

EMWD has a history of boom and bust development cycles. From the mid- 1980's to 1990's, population growth in EMWD routinely exceeded 10 percent 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 again brought accelerated population growth to the area. Growth within EMWD's service area reached its peak rate in 2005, but then there was a major decline in housing development and growth slowed again. Starting in 2006 EMWD saw a sharp decline in the number of new connections added, reaching a low point in 2010. Since 2010, new connections have slowly been increasing; but they remain well below the peak levels of new development seen in the early 2000's.

The cycle of booming growth followed by depressed development makes new development in EMWD's service area difficult to predict. On average, 6,700 new equivalent dwelling units (EDUs) per year were added to EMWD's service area from 2000 through 2015; but over that 15-year time period there have been two years with more than 15,000 EDUs added and three years with less than 2,000 EDUs added. Because of the variability in demand cycles, EMWD has developed a comprehensive database of planned projects that tracks proposed new development and land use changes. This database is used in facility and supply planning to project future demands.

Ultimate demand estimates indicate that before EMWD reaches build out, the population will more than double compared to the current size. Land will continue to be developed in western Riverside County as more and more people move into the area. Just as it has in the past, EMWD will continue to meet the challenges of new development with innovation, efficiency and responsibility. Figure 3-2 shows EMWD new EDUs for the years 2000 through 2015.

Figure 3-3: EMWD New EDUs– 2000 – 2015



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Chapter 4 System Water Use

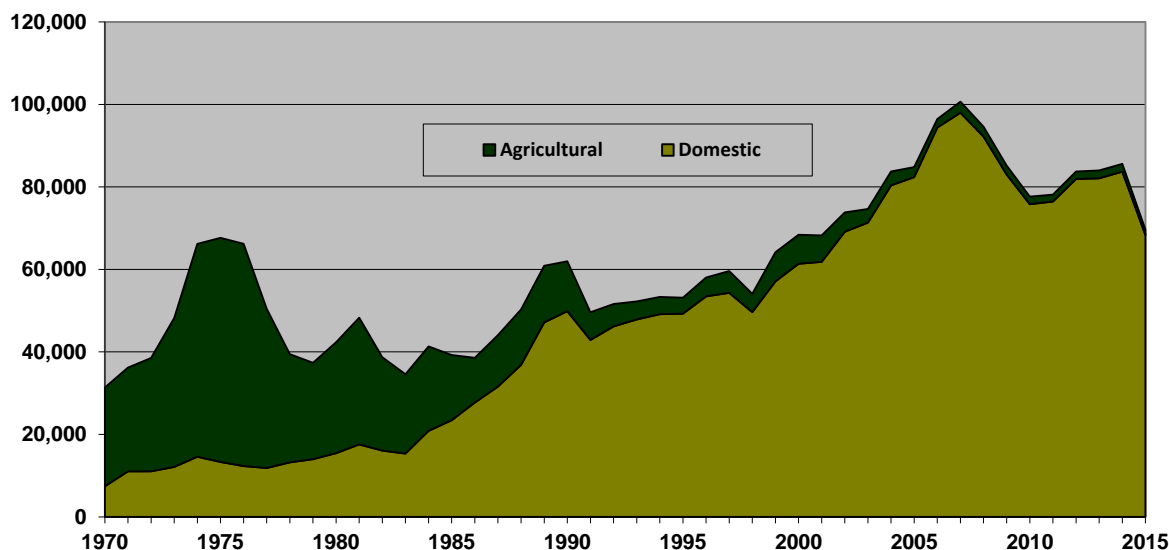
4.1 Overview

When EMWD was formed in 1950 it was a small agency, primarily serving agricultural customers. Since then, potable water use in EMWD's service area has shifted from primarily agricultural to urban use. The reduction in agricultural demand has two major causes: rural farm land has been transformed to urban housing, and most remaining agricultural demands have been shifted to the recycled water system.

The development of new homes and the accompanying increase in population led to the increasing demand for domestic water. Influenced by the last construction boom and drier than average weather conditions, total water demands grew through 2007 before declining significantly reaching a low point in 2010. The reduced demand can be attributed to several different factors including the implementation of an allocation-based tiered rate billing structure and an overall decline in the economy.

Since 2010, EMWD has experienced some increases in demand as the region has experienced dry weather patterns and a growing economy. Even with the warmer, drier weather, and improvements in the economy, demand has remained well below the peak seen in 2007. EMWD's proactive conservation program, including an allocation-based tiered rate billing structure, has reduced demand even as the agency has added almost 7,000 new dwelling units since 2010. In 2015, EMWD implemented Stage 4 of its WSCP in response to the 28 percent reduction requirement mandated by the SWRCB. In response, EMWD's customers reduced demand by more than 30 percent when compared to its peak demand in 2007.

Figure 4-1: Retail Potable Water Sales – 1970 – 2015



In addition to retail potable water demand, EMWD delivers water to seven wholesale customer agencies and meets a significant portion of demand with recycled water. The sections below summarize the past and projected retail and wholesale water use within EMWD's service area.

4.2 Water Use by Sector

Demands for EMWD were developed using information about planned development and land use. To track new developments, EMWD updates a GIS database that tracks proposed development quarterly. Currently, EMWD is tracking the status of over 700 proposed projects and over 150,000 residential units.

Growth rates were based on a forecast of new development prepared by Empire Economic in 2015. Although development has slowed significantly in recent years, new connections are still being added to EMWD's water and wastewater systems annually; and growth is expected to increase as the overall economy continues to grow. EMWD's growth forecasts include both the retail and wholesale service areas.

EMWD's retail demand projections include the water savings needed to meet the Water Conservation Act of 2009, SBx7-7 requirements. Demand forecasts for wholesale customers are developed from growth projections and through collaboration with sub agencies.

4.2.1 Retail Market Segments

EMWD's primary retail customers can be divided into residential, commercial, industrial, institutional, landscape and agricultural irrigation sectors. Although the residential sector is by far EMWD's largest customer segment, each market segment plays a role in the growth and development of EMWD's service area. Table 4-1 shows the past and current number of accounts by customer type. Table 4-2, Table 4-3, and Table 4-4 show EMWD's retail historical, current, and projected water use by customer type, respectively.

Table 4-1: Potable Retail Accounts by Customer Type – Actual and Projected

Use Type	Actual			Projected				
	2005	2010	2015	2020	2025	2030	2035	2040
Single Family	114,100	129,400	136,200	154,300	173,600	193,200	212,000	230,500
Multi-Family	1,000	4,300	4,300	4,900	5,500	6,100	6,800	7,300
Commercial	1,500	2,100	2,600	3,000	3,300	3,700	4,100	4,400
Industrial	100	100	200	200	200	200	200	300
Institutional/ Governmental	40	500	500	600	700	800	900	900
Landscape ¹	1,500	2,200	2,800	2,200	2,200	2,200	2,200	2,100
Agricultural irrigation	200	100	700	700	700	700	700	700
Total	118,440	138,700	147,300	165,900	186,200	206,900	226,900	246,200

1) Landscape accounts are projected to remain constant/decrease over time due to anticipated conversion to recycled water

Table 4-2: Retail Demands for Potable and Raw Water – Historical (AFY)

Use Type	Additional Description	2005	2010
Single Family		62,300	54,000
Multi-Family		5,500	6,100
Commercial		3,900	4,200
Industrial		400	400
Institutional / Governmental		2,900	2,300
Landscape		7,500	8,900
Agricultural irrigation	Potable Water	2,400	1,800
Agricultural irrigation	Raw Water	100	500
Losses	System losses & unbilled, authorized consumption	9,677	8,200
Total		94,677	86,400

Table 4-3: Retail Demands for Potable and Raw Water – Current (AFY)

DWR Table 4-1 Retail: Demands for Potable and Raw Water – Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	45,735
Multi-Family		Drinking Water	5,830
Commercial		Drinking Water	4,603
Industrial		Drinking Water	270
Institutional /Governmental		Drinking Water	2,083
Landscape		Drinking Water	7,735
Agricultural irrigation	Potable Water	Drinking Water	1,924
Agricultural irrigation	Raw Water	Raw Water	941
Agricultural irrigation ¹	Brackish groundwater used to supplement the recycled water system	Raw Water	682
Other	Temporary construction meters, etc.	Drinking Water	1,507
Other	Unbilled, authorized consumption	Drinking Water	3,444
Losses ²	Real and apparent losses	Drinking Water	4,183
Total			78,937

1) In 2015, brackish groundwater was used to supplement the recycled water system due to higher than average agricultural demands.

2) Losses reflect real and apparent losses for fiscal year 2014/2015.

Table 4-4: Retail Demands for Potable and Raw Water – Projected (AFY)

DWR Table 4-2 Retail: Demands for Potable and Raw Water – Projected						
Use Type	Additional Description	Projected Water Use¹				
		2020	2025	2030	2035	2040
Single Family		64,800	72,900	81,100	89,000	96,800
Multi-Family		8,300	9,300	10,300	11,400	12,300
Commercial		6,500	7,300	8,100	8,900	9,700
Industrial		400	400	500	500	600
Institutional / Governmental		3,000	3,300	3,700	4,100	4,400
Landscape ²		7,500	7,500	7,500	7,500	7,300
Agricultural irrigation	Potable Water	1,900	1,900	1,900	1,900	1,900
Agricultural irrigation	Raw Water	1,000	1,000	1,000	1,000	1,000
Losses ³	System losses & unbilled, authorized consumption	7,100	7,900	8,800	9,700	10,500
Total		100,500	111,500	122,900	134,000	144,500

1) Passive water savings due to the restrictions outlined in the Administrative Code are included in the demand projections for EMWD's retail service area.

2) Landscape demands remain constant/decrease over time as landscape accounts are offset by conversion to the recycled water system.

3) Projections for losses in the table include system losses (real and apparent) and unbilled, authorized consumption.

Residential consumption is the dominant demand for EMWD and this will continue in the future according to current general plans for the County of Riverside and local cities. Residential accounts are required to keep their demands below a budgeted allocation or pay a high rate for water use. Accounts dedicated to irrigating landscaped areas have the second highest consumption rate. Just as with residential accounts, landscape accounts are subject to a budgeted allocation or pay a higher rate for over budget use. New development in both of these account classes are provided with lower budget allocations to account for water use efficiency requirements for new development. Additional efficiency may occur in the future due to the recent 2015 update to the Model Water Efficient Landscape Ordinance (MWELO). The impact of the revised MWELO is still being estimated. Section 5, Article 6 of EMWD's Administrative Code details EMWD's rate structure. Passive water savings due to the restrictions outlined in the Administrative Code are included in the demand projections for EMWD's retail service area in Table 4-4.

Commercial developments will also continue to increase and will be focused along the major transportation corridors through EMWD's boundary (Interstate Highway 15, Interstate Highway 215, Highway 79, and Highway 74). Currently, commercial demands account for about six percent of EMWD's retail demand. Land use based projections indicate that the ratio of commercial demand to retail demand will increase slightly over time.

EMWD has a very small industrial use sector, accounting for less than 0.5 percent of retail demand. Industrial developments are proposed around Interstate Highway 215 and other main transportation corridors. Much of the proposed growth consists of large warehouse projects with minimal water demand. As much as feasible, EMWD will meet the needs of high water demand industrial customers with recycled water.

Currently, the demand from institutional accounts account for about three percent of retail demand for potable water. EMWD works closely with institutional and government accounts to help reduce their demand and promote the efficient use of water. Whenever possible, recycled water is used for landscape irrigation for schools and other government facilities. EMWD has also developed conservation programs designed to assist public sector accounts like schools to reduce demand through the retrofit of inefficient devices. These programs are discussed further in *Chapter 9 – Demand Management Measures*.

EMWD's service area has gone through a major transformation from a farming community to a residential community. Currently, agricultural demand accounts for less than four percent of EMWD's potable and raw water market, with a substantial portion of the agricultural community being served by the recycled water system. Agricultural demand for potable and raw water 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. It is also possible that a general decline over time may be observed both as a result of continued urbanization and increased recycled water usage.

4.2.2 Wholesale to Other Agencies

EMWD wholesales water to seven different agencies. The demand from each agency differs based on its need each year. These demands can be unstable at times as these agencies use water from EMWD to supplement their system when their local facilities are inadequate or fail. EMWD will also provide backup for the North Perris Water System if an emergency should occur.

Under the Hemet/San Jacinto Groundwater Management Area Water Management Plan (HSJ Management Plan), EMWD will be responsible for providing water to recharge the groundwater basin. A portion of the water supplied will be SWP water imported through MWD to meet the requirements of the Soboba Band of Luiseño Indians Water Settlement Agreement (detailed in Section 6.3.2) and to improve the reliability of groundwater in the area. Individual agencies, including EMWD, will extract their allotted amount of the recharged water from the basin using wells already in place and new wells yet to be constructed. As described in *Chapter 6 – System Supplies*, MWD will deliver a long-term average of 7,500 AFY to EMWD for groundwater recharge as part of the agreement; but due to drought conditions, no recharge occurred in 2015.

A portion of the water EMWD wholesales to LHMWD is raw water for agricultural uses. This water is needed especially when surface water is not available to LHMWD in dry years.

Table 4-5 shows the historical wholesale water sales to other agencies. The total current and projected wholesale demands are summarized in Table 4-6 and Table 4-7, respectively. Wholesale demand projections are based on communications with sub agencies and respective growth projections for those agencies.

Table 4-5: Wholesale to Other Agencies – Historical (AFY)

Water Agency	Actual Sales	
	2005	2010
City of Hemet	100	0
City of Perris Water System	1,900	1,700
City of San Jacinto	0	0
Nuevo Water Company	800	600
Murrieta Water Company	100	1,600
Rancho California Water District	26,300	21,900
Lake Hemet Municipal Water District ¹	100	1,300
Hemet-San Jacinto Watermaster ²	0	0
Total	29,300	27,100

1) Sales of water to Lake Hemet are for non-potable supplies used to meet agricultural demand

2) Water to the Hemet-San Jacinto Watermaster is for groundwater recharge that will occur under the Hemet/San Jacinto Water Management Plan

Table 4-6: Wholesale Demands for Potable and Raw Water – Actual (AFY)

DWR Table 4-1 Wholesale: Demands for Potable and Raw Water – Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Sales to other agencies	City of Hemet	Drinking Water	0
Sales to other agencies	City of Perris Water System	Drinking Water	1,542
Sales to other agencies	City of San Jacinto	Drinking Water	0
Sales to other agencies	Nuevo Water Company	Drinking Water	247
Sales to other agencies	Western Municipal Water District Murrieta Division	Drinking Water	728
Sales to other agencies	Rancho California Water District	Drinking Water	4,015
Sales to other agencies	Rancho California Water District	Raw Water	10,925
Sales to other agencies	Lake Hemet Municipal Water District	Raw Water	4,311
Groundwater recharge ¹	Imported water recharge to the Hemet/San Jacinto Basin	Raw Water	0
Total			21,768

1) Groundwater recharge will occur under the Hemet/San Jacinto Water Management Plan

Table 4-7: Wholesale Demands for Potable and Raw Water – Projected (AFY)

DWR Table 4-2 Wholesale: Demands for Potable and Raw Water – Projected						
Use Type	Additional Description	Projected Water Use				
		2020	2025	2030	2035	2040
Sales to other agencies	City of Hemet	0	0	0	0	0
Sales to other agencies	City of Perris Water System	1,800	1,900	2,000	2,100	2,200
Sales to other agencies	City of San Jacinto	0	0	0	0	0
Sales to other agencies	Nuevo Water Company	400	500	600	600	700
Sales to other agencies	Western Municipal Water District Murrieta Division	2,500	3,900	5,200	6,500	7,900
Sales to other agencies	Rancho California Water District	33,600	35,200	36,900	38,600	40,200
Sales to other agencies ¹	Raw Water to Lake Hemet Municipal Water District	4,700	5,100	5,500	5,900	6,300
Groundwater recharge ²	Imported water recharge to the Hemet/San Jacinto Basin	7,500	7,500	7,500	7,500	7,500
Total		50,500	54,100	57,700	61,200	64,800

1) Deliveries to Lake Hemet Municipal Water District may be in the form of recharge managed through the Hemet/San Jacinto Water Management Plan.

2) Groundwater recharge will occur under the Hemet/San Jacinto Water Management Plan.

4.2.3 Other Water Uses

In addition to potable and raw water demands, EMWD also uses recycled water for beneficial uses such as municipal, industrial, landscape, agricultural and environmental use. These uses are described in more detail in *Chapter 6 – System Supplies*. Total current and projected retail and wholesale recycled water demands are summarized in Table 4-8 and Table 4-9, respectively, along with retail and wholesale total potable and raw water use.

Table 4-8: Retail Total Water Demands (AFY)

DWR Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	78,937	100,500	111,500	122,900	134,000	144,500
Recycled Water Demand	44,150	45,245	48,334	50,017	51,800	53,300
Total Water Demand	123,087	145,745	159,834	172,917	185,800	197,800

Table 4-9: Wholesale Total Water Demands (AFY)

DWR Table 4-3 Wholesale: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	21,768	50,500	54,100	57,700	61,200	64,800
Recycled Water Demand	1,235	1,656	4,766	5,183	5,600	5,600
Total Water Demand	23,003	52,156	58,866	62,883	66,800	70,400

4.3 Distribution System Water Losses

Water loss is a combination of apparent losses and real losses. Apparent losses are attributed to unauthorized consumption, customer metering inaccuracies and systematic data handling errors. Real losses are attributed to such physical water losses as leakage along the pipe system, at the storage tanks, or at the service connections. Real losses in EMWD's potable system are highest where pipelines are older and smaller in size, especially in the Hemet and San Jacinto areas that were once owned by the Fruitvale Mutual Water Company. EMWD tracks pipe leaks and identifies pipes for replacement as part of its capital improvement program. These efforts are described in more detail in *Chapter 9 – Demand Management Measures*.

EMWD used the American Water Works Association (AWWA) water system balance methodology to quantify water loss for fiscal year (FY) 2014/2015. This water loss represents the most recent 12-month period calculated using the AWWA methodology. While EMWD provides both retail and wholesale services and generally reports these services separately throughout this UWMP, its physical facilities are shared. Therefore, losses cannot be easily attributed to one system or the other. For this reason, all of EMWD's water losses for this 12-month period are reported in a single table. Table 4-10 summarizes the water loss results of the AWWA water audit for EMWD's combined retail and wholesale system. A copy of EMWD's AWWA water audit for FY 2014/2015 is included as Appendix D.

Table 4-10: EMWD's 12 Month Water Loss Audit Reporting

DWR Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss^{1, 2*} (AFY)
07/2014	4,183
<i>* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.</i>	

1) EMWD's retail and wholesale physical facilities are shared. Therefore, losses cannot be easily attributed to one system or the other. For this reason, all of EMWD's water losses are reported in the DWR Table 4-4 for retail.

2) Water Loss includes Real losses (3,497 AF) and Apparent losses (686 AF)

4.4 Estimating Future Water Savings

EMWD demand projections include water savings that result from a progressive conservation rate structure. EMWD uses an allocation-based tiered rate structure to encourage conservation by sending a strong price signal for water use over a budget allocation. Indoor budgets are based on an allocation of 60 gallons per capita per day. Outdoor budgets are based on the irrigated area and a percent of evapotranspiration. The percent of evapotranspiration is tied to the date the landscaping is installed. The rate structure is used to enforce codes and standards in place to promote efficiency. As codes and standards increase efficiency over time, EMWD has the ability to adjust the allocations. The most recent update to EMWD's allocations occurred in May of 2015, when a fifty percent evapotranspiration standard was adopted for all new non-functional landscape installed after June 1, 2015. The impact of the revised restrictions on new landscape is still being evaluated and not included in current water saving estimates. The details on EMWD's rate structure can be found in Section 5, Article 6 of EMWD's Administrative Code. Table 4-11 confirms that future water savings and low income demands are included in projections.

Table 4-11: Inclusion in Water Use Projections

DWR Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook)	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	Section 4.2.1 and Section 4.4
Are Lower Income Residential Demands Included In Projections?	Yes

4.5 Lower Income Housing Demand

Senate Bill 1087 requires that water use projections in an UWMP include the projected water use for single family and multi-family residential housing for lower income households as identified in the housing element of any city and county in the service area of the supplier. EMWD used the percent of low income and very low income housing identified in the Housing Needs Assessment Allocation Plan for January 1, 2014 through October 1, 2021, approved by the Southern California Association of Governments, to estimate the number of new low income housing units that may require service within EMWD's retail service area. The number of low income housing units and their associated demands are shown in Table 4-12. The demands for these units are included in the total projected residential retail demands in Table 4-4.

Table 4-12: Projected New Retail Low Income Housing Units and Demands – 2020 – 2040

		Retail Service Area								
		City of Hemet	City of Menifee	City of Moreno Valley	City of Murrieta	City of Perris	City of San Jacinto	City of Temecula	Riverside County	Total
2020	Housing Units	1,400	2,200	1,900	600	1,500	1,900	100	2,900	12,500
	Demand (AFY)	600	900	800	300	600	800	40	1,100	5,140
2025	Housing Units	1,300	1,500	1,900	600	1,400	1,300	300	3,400	11,700
	Demand (AFY)	500	600	700	200	600	500	120	1,400	4,620
2030	Housing Units	1,600	1,500	2,300	600	1,400	900	100	3,100	11,500
	Demand (AFY)	600	600	900	200	600	400	40	1,200	4,540
2035	Housing Units	1,700	1,800	1,500	700	1,400	800	100	3,300	11,300
	Demand (AFY)	600	700	600	200	600	200	40	1,400	4,340
2040	Housing Units	1,800	1,900	1,700	700	1,600	800	100	3,600	12,200
	Demand (AFY)	700	800	700	300	700	300	50	1,400	4,950

4.6 Climate Change Impacts

EMWD has considered the impacts of climate change on water demands as part of long-term strategic planning. Climate change is expected to cause a rise in temperatures in the region which will increase evapotranspiration and water demand. This is particularly true for EMWD's agricultural sector. Additionally, in urbanized areas with limited vegetation, climate change can exacerbate the heat island effect which may result in increased energy and cooling demands.

EMWD's service area lies within the Santa Ana River and Santa Margarita River Watersheds. The Santa Ana River Watershed is covered under the Santa Ana Watershed Planning Authority's (SAWPA)'s Integrated Regional Water Management (IRWM) Plan for the Santa Ana River Watershed. A climate change vulnerability assessment was completed for the region as part of the 2014 IRWM Plan update. Key demand vulnerabilities identified by the SAWPA Region that relate to EMWD's service area include:

- Increased temperature could lead to increases in industrial cooling water needs
- Seasonal outdoor water use is expected to increase
- Climate-sensitive crops will be impacted
- Continued education and increased employment of efficient use technologies will be required

- Changes in snowmelt patterns in the future may make it difficult to balance water demands

EMWD continues to work toward decreasing demands for potable water through water conservation programs and full utilization of recycled water. EMWD's conversion of agricultural, landscape and industrial uses to recycled water has helped EMWD mitigate climate change impacts on these demands.

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Chapter 5 Baseline and Targets

5.1 Water Conservation Act of 2009

The Water Conservation Act of 2009, SBx7-7, set a requirement for water agencies to reduce their per capita water use by the year 2020. The overall goal is to reach a statewide reduction of per capita urban water use of 20 percent by December 31, 2020, with an intermediate 10 percent reduction by December 31, 2015. Demand reduction can be achieved through both conservation and the use of recycled water as a potable demand offset.

An urban water provider's 2015 UWMP must include a target for per capita water use in 2020 and must demonstrate compliance with the established interim water use target for 2015. Effective 2016, urban water retailers who do not meet their water conservation targets are ineligible for state water grants or loans unless one of two exceptions is applicable. The first exception states that an urban supplier may be eligible if they have submitted a compliance schedule, financing plan and budget to DWR for approval, showing how they will meet their target per capita water use by 2020. The second exception states that an urban water supplier may be eligible for funding if their entire water service area qualifies as a disadvantaged community.

Any one of four methods can be used to determine the per capita water use targets. Three methods were specified in the legislation, and the fourth was developed by DWR. The four methods are:

- **Method 1:** Use 80 percent of the baseline as the per capita water use target.
- **Method 2:** Use an efficiency standard with targets for indoor use, landscape use, and commercial, industrial and institutional (CII) use and an optional target for agricultural use.
- **Method 3:** Use 95 percent of the applicable state hydrologic region target developed by DWR and published in the state's 20X2020 Water Conservation Plan.
- **Method 4:** Use an alternative method developed by DWR that accounts for water savings due to water metering and achieving water conservation measures in three water use sectors.

DWR, through a public process, developed and published Methodologies for Calculating Baseline and Compliance Urban Water Per Capita Use, last updated February 2011, for consistent application of SBx7-7 throughout the state.

For the 2015 UWMP, water purveyors are required to recalculate baseline population using 2010 Census data. Agencies may change the years selected for their baseline periods compared to the 2010 UWMP based on changes to the calculated population. Agencies may also select a different target methodology than was used for the 2010 UWMP, though this methodology must remain consistent for the 2020 UWMP.

5.2 Baseline Periods

Water purveyors must define a continuous 10- to 15-year baseline period ending between December 31, 2004 and December 31, 2010 and calculate an average water use over this period. If the percentage of recycled water used in the year 2008 was at least 10 percent of the total water used, the agency may use up to a 15-year period. If the percentage of recycled water was less than 10 percent, a 10-year baseline period is required. Additionally, a continuous five-year period ending between December 31, 2007 and December 31, 2010 is used to confirm that the selected 2020 target meets the minimum water use reduction requirements.

EMWD selected a 10-year baseline period beginning 1999 and ending 2008 despite providing more than 10 percent recycled water in 2008. A 5-year baseline period was chosen between 2003 and 2007 for the target confirmation. Table 5-1 summarizes the base period ranges.

Table 5-1: Base Period Ranges

Baseline	Parameter	Value	Units
10- to 15-Year Base Period	2008 total water deliveries	125,284	AF
	2008 total volume of delivered recycled water	28,100	AF
	2008 recycled water as a percent of total deliveries	22.4	percent
	Number of years in base period	10	years
	Year beginning base period range	1999	--
	Year ending base period range	2008	--
5-Year Base Period	Number of years in base period	5	years
	Year beginning base period range	2003	--
	Year ending base period range	2007	--

5.3 Gross Water Use

Gross water use was calculated using the best available meter data for water entering and exiting EMWD's distribution system. The distribution system includes potable water service for both domestic and agricultural demand, and raw water service to a few agricultural customers.

Potable sources include potable groundwater wells, treated water from two desalination plants, imported water from MWD and water imported from other agencies. Imported water from MWD includes water delivered directly to the potable distribution system and raw water treated at EMWD facilities. Small amounts of water are also delivered from Western Municipal Water District. Only water delivered to the distribution system is included in the gross water calculations. The single source for the raw water system is imported raw water from MWD.

EMWD sells a portion of the water that enters its distribution system to wholesale customers. Some MWD connections also have a portion of water that is diverted to other agencies without entering EMWD's distribution system. RCWD, EMWD's largest wholesale customer, has dedicated connections to MWD's system and does not impact EMWD's distribution system. Table 5-2 summarizes the gross water use calculations.

Table 5-2: Gross Water Use Calculations (AFY) – 1999-2008

	Potable Wells	Desalters	MWD Treated Imported Water	MWD Raw Water	EMWD Water Filtration Plants	Imported from other Agencies	Exported to other Utilities	Gross Water Use
1999	20,280	0	62,896	0	0	76	-13,862	69,390
2000	21,287	0	68,454	0	0	111	-17,847	72,005
2001	18,536	0	68,260	0	0	39	-16,776	70,059
2002	18,861	4	77,313	1,064	0	36	-15,995	81,283
2003	17,574	999	74,516	760	3,741	35	-11,309	86,316
2004	16,564	1,440	60,798	233	7,911	37	-7,006	79,977
2005	18,064	855	73,029	108	5,636	31	-3,046	94,677
2006	19,644	4,802	72,515	91	8,405	39	-4,665	100,831
2007	19,489	4,792	70,430	41	17,271	37	-7,682	104,378
2008	20,043	2,973	62,900	353	16,594	831	-6,510	97,184

5.4 Service Area Population

EMWD's retail baseline population was calculated using data from the 1990, 2000, and 2010 U.S. Census and DWR's Population Tool. The Population Tool uses preloaded Census data for the years 1990, 2000, and 2010 and uploaded service area boundary maps for the corresponding years to calculate service area population in Census years. The annual numbers of single family and multi-family connections in EMWD's retail service area were used to calculate a population-per-connection ratio for Census years using data on the number of single family and multi-family households. The Population Tool interpolated the population-per-connection ratio between Census years and used the annual numbers of single family and multi-family connections in EMWD's service area to estimate population for non-Census years.

To estimate population for the 2015 interim water use target, EMWD used a methodology similar to DWR's Population Tool, but consistent with annual reporting to the SWRCB. To determine 2015 retail population, EMWD added the number of new EDUs that have been installed since 2010 and multiplied the new EDUs by the estimated persons-per-connection factor. This alternative methodology was pre-approved by DWR. EMWD's retail baseline and 2015 population is summarized in Table 5-3.

Table 5-3: Baseline Retail Population

Baseline Year	Year	Population
Year 1	1999	292,123
Year 2	2000	303,678
Year 3	2001	317,457
Year 4	2002	357,783
Year 5	2003	364,893
Year 6	2004	389,897
Year 7	2005	430,314
Year 8	2006	468,467
Year 9	2007	486,901
Year 10	2008	500,589
--	2015	546,146

5.5 Baseline Daily per Capita Water Use

Table 5-4 summarizes the retail service area population and daily per capita water use, reported in gallons per capita per day (GPCD), for the 10-year baseline period that are used to calculate the baseline per capita use. Table 5-5 summarizes the retail service area population and daily per capita use values used to calculate the minimum per capita reduction estimated for the five-year baseline period.

Using the methodology established by DWR, EMWD has calculated its baseline water use to be 197 GPCD, based on the average GPCD between 1999 and 2008.

Table 5-4: 10-Year Baseline Daily Per Capita Use – 1999-2008

Base Years	Service Area Population	Gross Water Use (AF)	Daily Per Capita Water Use (GPCD)
1999	292,123	69,390	212
2000	303,678	72,005	212
2001	317,457	70,059	197
2002	357,783	81,283	203
2003	364,893	86,289	211
2004	389,897	79,977	183
2005	430,314	94,677	196
2006	468,467	100,831	192
2007	486,901	104,378	191
2008	500,589	97,184	173
10-Year Average Baseline GPCD			197

Table 5-5: Five-Year Baseline Daily Per Capita Use – 2003-2007

Base Years	Service Area Population	Gross Water Use (AF)	Daily Per Capita Water Use (GPCD)
2003	364,893	86,289	211
2004	389,897	79,977	183
2005	430,314	94,677	196
2006	468,467	100,821	192
2007	486,901	104,378	191
5-Year Average Baseline GPCD			195

5.6 Water Use Targets

EMWD has selected DWR's Target Method 2 to determine compliance with SBx7-7. Target Method 2 utilizes the sum of three efficiency standards for water demand to calculate the 2015 and 2020 targets:

- **Efficient Indoor Residential Use:** Indoor residential per capita use to meet target demand of 55 GPCD.
- **Landscape Water Use Equivalent to Model Ordinance:** Landscape irrigation, delivered either through a residential meter or a dedicated landscape meter to meet the efficiency standards of the MWELO. Agricultural water use also to meet the efficiency standards of the MWELO.
- **CII Water Use:** Ten percent reduction in water use from baseline CII use.

In 2009, EMWD implemented a budget-based tiered rate program. For residential and landscape customers, these budgets are based on persons per household and the irrigated landscape areas. To develop budgets for over 130,000 accounts, EMWD estimated irrigated areas using parcel data supplied by the County of Riverside. Since 2009, EMWD has measured over 13,000 acres of landscape area using GIS and aerial photography or field verification. This information was used to estimate the remaining irrigated area for 2020. Actual irrigated area will be determined in the compliance year.

Agricultural areas were also measured using aerial photography and are anticipated to decrease through 2020. Agricultural areas are referred to as “Special Landscape Areas” and receive an Evapotranspiration Adjustment Factor (ETAF) of up to 1.0. Actual ETAF is based on the crop coefficient; 0.55 for citrus, 0.8 for vegetables and other row crops and 1.0 for grain. EMWD has also assessed all of its dedicated meters at school sites to determine recreational landscape areas. These have been added to the Special Landscape Areas. Landscape installed pre-2010 receives an ETAF of 0.8 and landscape installed after 2010 receives an ETAF of 0.7 according to the MWELO. Table 5-6 summarizes the pre-2010 landscape, post-2010 landscape and agricultural landscape irrigated areas and target water uses.

Table 5-6: Landscape Irrigated Area Efficiency Standard

ETo for Service Area (inches/year) from Landscape Parcels Table		58.8
Landscape Parcels	Acres	Water Use (AF)
Acres of landscape installed pre-2010 (ETAF 0.8) ¹	15,559	61,014
Acres of landscape installed post-2010 (ETAF 0.7) ¹	999	3,428
Acres of Special Landscape Area (ETAF 0.55) ¹	134	361
Acres of Special Landscape Area (ETAF 0.8) ¹	1,500	5,882
Acres of Special Landscape Area (ETAF 1.0) ¹	384	1,885
Target Landscape Water Use for 2015		72,570

1) ETAF - Evapotranspiration Adjustment Factor. Refer to the Model Water Efficient Landscape Ordinance.

Table 5-7 contains the calculation for the CII target per capita water use. CII water use does not include multifamily.

Table 5-7: Commercial, Industrial and Institutional, Daily Per Capita Use – 1999-2008

Base Years	Service Area Population	CII Water Use (AF)	CII Daily Per Capita Water Use (GPCD)
1999	292,123	6,740	20.6
2000	303,678	7,170	21.1
2001	317,457	7,120	20.0
2002	357,783	7,280	18.2
2003	364,893	7,230	17.7
2004	389,897	7,850	18.0
2005	430,314	7,280	15.1
2006	468,467	8,240	15.7
2007	486,901	8,370	15.3
2008	500,589	8,190	14.6
Average GPCD			17.6
CII Target GPCD (10% Reduction of Base)			16

Table 5-8 summarizes the three efficiency targets for a 2020 compliance target of 176 GPCD and a 2015 interim target of 187 GPCD. The 2020 compliance target is lower than the minimum five percent reduction of the five-year average GPCD, or 195 GPCD. The baselines and targets are summarized in Table 5-9.

Table 5-8: Target Method 2 Compliance Water Use Summary (GPCD)

2020 Population	617,100	
Sector	Volume (AF)	GPCD
Target Indoor Residential Water Use	38,016	55
Target Landscape Water Use	72,570	105
Target CII Water Use	10,966	16
2020 Target	121,552	176

Table 5-9: Baselines and Targets Summary

DWR Table 5-1 Baselines and Targets Summary <i>Retail Agency or Regional Alliance Only</i>					
Baseline Period	Start Year	End Year	Average Baseline GPCD	2015 Interim Target GPCD	Confirmed 2020 Target GPCD
10-15 year	1999	2008	197	187	176
5 Year	2003	2007	195	--	--

5.7 2015 Compliance Daily per Capita Water Use

Agencies must demonstrate compliance with the 2015 interim water use target. In 2015, EMWD's gross water use was 78,937 AF as shown in Table 5-10. Gross water use includes all potable and raw water into EMWD's retail distribution, excluding exports to other agencies as described in Section 5.3. EMWD's retail population in 2015 is estimated at 546,146 as described in Section 5.4. Therefore, EMWD's actual 2015 per capita use is 129 GPCD, which is well below the 2015 interim water use target as shown in Table 5-11. No optional adjustments were employed to reduce the 2015 actual GPCD any further.

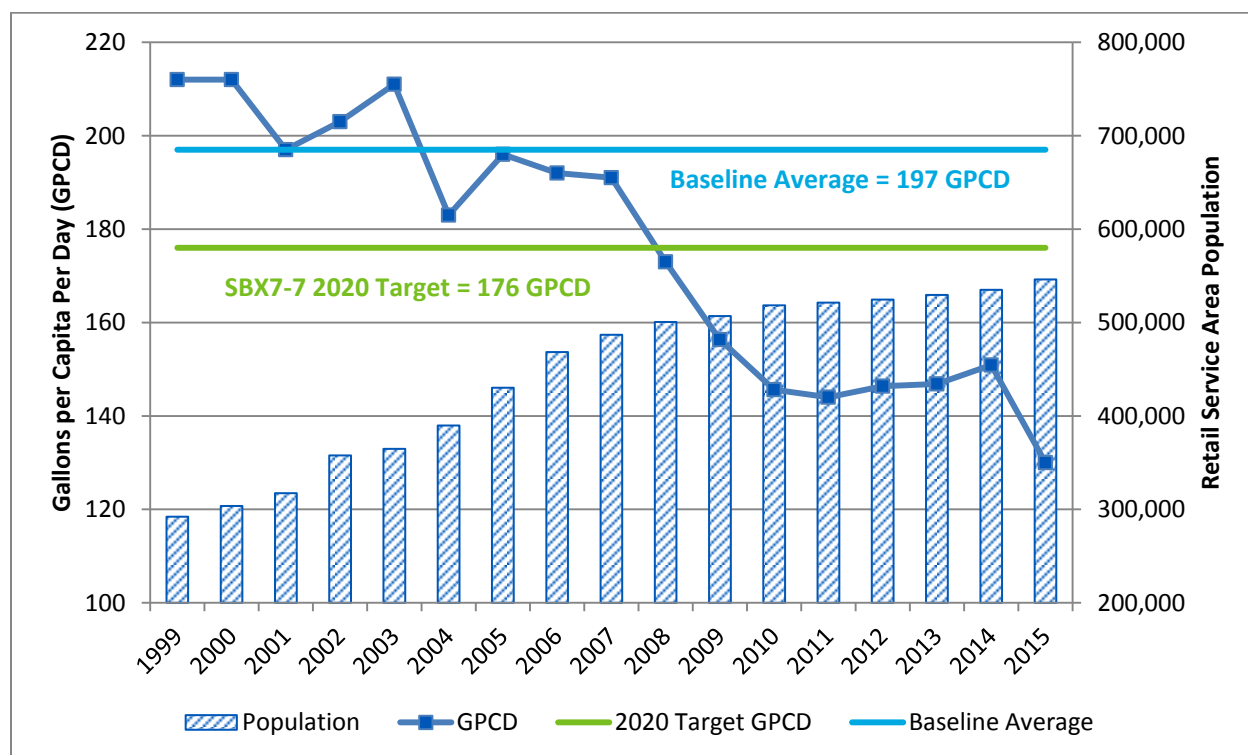
Table 5-10: Gross Water Use for 2015 (AFY)

Supply Source	2015
Potable Wells	14,570
Desalters	7,288
Mills and Skinner Plants	39,344
MWD Raw Water	941
EMWD Water Filtration Plants	18,628
Raw Water Augmentation	682
Exported to other Utilities	-2,516
Gross Water Use	78,937

Table 5-11: 2015 Compliance

DWR Table 5-2: 2015 Compliance Retail Agency or Regional Alliance Only*								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments to 2015 GPCD					2015 GPCD	Did Supplier Achieve Targeted Reduction for 2015?
		Extra- ordinary Events	Economic Adjustment	Weather Normalization	TOTAL Adjustments	Adjusted 2015 GPCD		
129	187	0	0	0	0	129	129	Yes

Figure 5-1: Progress Towards SBx7-7 Target



As seen in Figure 5-1, EMWD's GPCD dropped significantly in 2015 due to mandatory conservation standards in place. Even before mandatory restrictions were implemented, EMWD's GPCD was trending lower than both its 2015 and 2020 target. EMWD will continue to reduce potable water demand to meet the goals of SBx7-7 by using recycled water to offset potable demand and reducing demand for water through conservation. Conservation efforts are focused on three methods: 1) a budget-based tiered rate, 2) requirements for water efficiency in new construction and 3) an active conservation program. Water use reduction will continue to be focused on outdoor demand reduction by all customer types. Using the above three conservation methods and expanded use of recycled water, EMWD anticipates it will be able to meet its 2020 water use target of 176 GPCD and comply with all the requirements of SBx7-7. EMWD's retail water use efficiency methods are described in more detail in *Chapter 9 – Demand Management Measures*.

5.8 Measures to Reduce Wholesale Customer Demands

As a wholesaler, EMWD is required to provide an assessment of its present and proposed future measures, programs, and policies that will help its wholesale customers achieve their SBx7-7 water use reduction targets. As both a wholesaler and a retailer, EMWD currently participates in and supports programs developed and implemented by MWD that benefit its entire service area, including wholesale customers. These programs include region-wide rebates for both commercial and residential customers, conservation messaging and outreach, and research and development of new conservation programs and devices. EMWD also actively promotes conservation throughout Riverside County through participation in organizations such as the Riverside County Water Task Force and the San Jacinto Valley Conservation League. EMWD will continue to support water reduction by wholesale customers through the use of outreach, technical support and participation in regional programs. EMWD's wholesale water conservation efforts are described in more detail in *Chapter 9 – Demand Management Measures*.

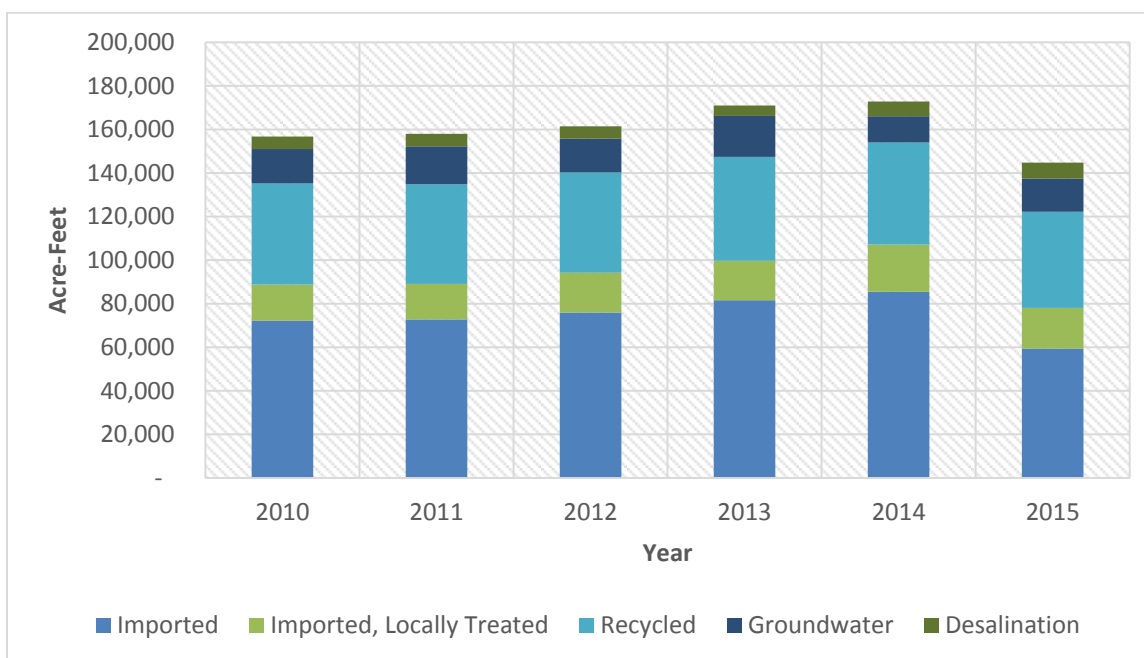
Chapter 6 System Supplies

6.1 Supply Overview

EMWD has a diverse portfolio of local and imported supplies. Local supplies include recycled water, potable groundwater, and desalinated groundwater. EMWD is a leader in recycled water production and use. Since 2014, EMWD has used 100 percent of its recycled water to irrigate landscape and agricultural fields and provide water for industrial customers. Groundwater is produced from two management areas within the service area. EMWD works diligently with other stakeholders to protect the quality and integrity of the groundwater basins. These efforts include recharging the basins with imported water and limiting native groundwater production when appropriate. Currently, EMWD is developing a plan to expand groundwater recharge to improve reliability for its customers during normal and dry year demand periods. In addition to the production of potable groundwater, EMWD treats brackish groundwater at two locations. EMWD's groundwater desalination program has the benefit of not only providing a sustainable, reliable source of potable water for its customers, but also protecting higher quality groundwater from rising levels of brackish groundwater. These local supplies help EMWD meet regional goals for supply reliability and help limit the impact of imported water shortages.

In addition to local supplies EMWD receives imported water from MWD in three forms: delivered directly as potable water, delivered to EMWD as raw water and then treated at EMWD's two local filtration plants, or delivered to EMWD as raw water for non-potable use and groundwater recharge. Figure 6-1 illustrates the volumes of EMWD's imported water, locally imported water, recycled water, groundwater, and desalinated groundwater supplies from 2010 to 2015 in AFY.

Figure 6-1: Water Received by Source (AF) – 2010 – 2015



EMWD depends on MWD for approximately half of its retail water supply. For the past five years, EMWD has been able to maintain a balance of local and imported water even as new connections were added. This was accomplished through the implementation of local supply projects and increased water use efficiency. In 2015, EMWD's reliance on MWD was lower than average due to mandatory restrictions put in place by SWRCB, which required EMWD customers to reduce their demands. This demand reduction resulted in reduced imported water purchases by EMWD in 2015.

Information about EMWD's historical and current water supplies for its retail and wholesale service areas is included in Table 6-1 and Table 6-2, respectively. These supplies are discussed in more detail in the sections that follow.

Table 6-1: Total Historical and Current Retail Water Supply (AFY) – 2010 – 2015

Type	Source	2010	2011	2012	2013	2014	2015
Imported – Treated	MWD	49,709	46,979	53,181	52,293	52,910	36,828
Imported – Locally Treated	MWD	16,629	16,266	18,283	18,154	21,616	18,628
Imported – Raw	MWD	512	691	554	764	768	941
Groundwater	Hemet/San Jacinto and West San Jacinto Basins	15,748	17,465	15,490	18,824	12,037	15,252 ¹
Desalination	West San Jacinto Basin	5,787	5,706	5,665	4,800	6,776	7,288
Recycled	EMWD Regional Water Reclamation Facilities	46,451	45,756	46,021	47,638	46,872	44,150
Total		134,836	132,863	139,194	142,473	140,979	123,087

1) Includes raw, brackish groundwater used to augment the recycled water system.

Table 6-2: Total Historical and Current Wholesale Water Supply (AFY) – 2010 – 2015

Type	Source	2010	2011	2012	2013	2014	2015
Imported – Treated	MWD	11,004	11,667	12,092	13,445	17,303	6,532
Imported – Raw	MWD	10,924	13,461	10,127	15,105	14,532	15,236
Recycled	EMWD Regional Water Reclamation Facilities	871	728	812	1,239	1,172	1,235
Total		22,799	25,856	23,031	29,789	33,007	23,003

6.2 Imported Water

EMWD relies on MWD for the majority of its potable water supply. Over the past five years, deliveries from MWD to EMWD's retail service area ranged between 56,397 AF and 75,294 AF. In 2015, approximately 40 percent of EMWD's total retail supply was imported water delivered through MWD. Reduced imported water use in 2015 was a direct result of the SWRCB's mandatory restrictions put in place to meet a statewide reduction of 25 percent. The sections that follow provide background information on MWD and its relationship to EMWD.

6.2.1 MWD Overview

MWD was formed in 1928 by thirteen Southern California cities to develop, store and distribute water for domestic and municipal purposes to the residents of Southern California. Today, the MWD service area stretches across the Southern California coastal plain to 26 member agencies and includes portions of Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. In 2014, MWD's service area

population was estimated to be 18,508,000 people, approximately 86 percent of the population in the six counties served by MWD.

MWD is a wholesale water provider and has no retail customers. It provides treated and untreated water directly to its member agencies. Over the last ten years, MWD has provided between 50 percent and 60 percent of the municipal, industrial, 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.

EMWD is one of the 26 member agencies that make up MWD, which include fourteen cities, ten other municipal water districts and one county water authority. The statutory relationship between MWD and its member agencies establishes the scope of EMWD's entitlements from MWD. EMWD, like other member agencies, receives deliveries at different points in the system and pays 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 then works with member agencies to develop forecasts of long-term future water supply. MWD delivers supply to member agencies from two sources, the CRA, which it owns and operates, and the SWP, owned and operated by DWR. Figure 6-2 shows MWD facilities in California. Additional information about MWD is provided in MWD's 2015 UWMP.

Current Challenges

In the past five years, MWD has encountered several challenges in delivering an adequate, reliable, high quality water supply to its member agencies. Many of these challenges can be tied to dry hydrologic conditions that persisted through 2015. The water conditions were shaped by several extraordinary events including:

- Historic drought in California leading to record low SWP allocation of five percent in 2014 and 20 percent in 2015;
- An extended 16-year drought on the Colorado River watershed that has decreased storage levels in Lake Mead and Lake Powell and kept storage below surplus levels through 2015;
- Low groundwater and local reservoir levels throughout Southern California due to dry hydrology;
- Significant reduction in SWP deliveries due to the restrictions in place to protect endangered Delta smelt and salmon which result in sizable losses of water supply to the ocean;
- Lake Oroville dropping within ten thousand AF (TAF) of its historic lowest operating levels in 2014; and
- Drought and environmental mitigation impacting the supply available from the Los Angeles Aqueduct.

These challenges led to significant withdrawals from MWD's surface reservations and groundwater banking and conjunctive use programs to meet demand. MWD also responded with a record amount of water-saving rebates and refocused its efforts to develop local resources.

Hydrologic conditions show signs of improvement in 2016 with snow pack and rain fall close to average in Northern California and an expected SWP allocation of 45 percent or better. However a single year cannot restore all of the storage that has been depleted over several years. It remains important that MWD and its member agencies maintain flexible and adaptive regional planning strategies.

Figure 6-2: MWD Facilities in California



6.2.2 Colorado River Aqueduct Overview

MWD was established more than eighty years ago to obtain an allotment of Colorado River water and today the CRA continues to be a core supply for Southern California. The CRA, with a 1.2 million AF (MAF) capacity, transports water from Lake Havasu, at the border of California and Arizona, approximately 242 miles to Lake Mathews in Riverside County.

Since 1999, the Colorado River has been experiencing a prolonged drought. During 2005, 2008 and 2009, drought conditions eased somewhat with near or above average inflow conditions and net gains in storage. Drought conditions resumed in 2012 with the runoff situation being among the four driest in history. During the drought conditions, Colorado system storage has decreased to approximately 50 percent of capacity.

MWD's goal for the CRA is to "maintain current supplies and programs, while also maintaining flexibility through dry-year programs and storage." MWD has a legal right to receive water from the Colorado River under a permanent service agreement with the Secretary of the Interior and holds a basic apportionment of 550 TAF of water from the Colorado River. In 2003, the Quantification Settlement Agreement among Imperial Irrigation District, Coachella Valley Water District, and MWD established entitlements for each agency and facilitated the transfer of water from agricultural agencies to urban uses. Over the years, MWD has increased the reliable supply from the CRA through funding and implementing programs including: farm and irrigation district conservation programs, land management programs, improved reservoir system operations, and water transfers and exchanges through arrangements with agricultural water districts in Southern California and entities in Arizona and Nevada that use Colorado River delivered by the U.S. Department of the Interior, Bureau of Reclamation (USBR). Through these efforts MWD is able to obtain between 1.16 and 1.39 MAF of water during normal, historic single-dry and historic multiple-dry years. MWD also has an additional 25 TAF of supplies under development. In addition to MWD supplies, the CRA is also used to convey non-MWD supplies to other parties including over 200 TAF to the San Diego County Water Authority (SDCWA) as part of an agreement between SDCWA and the Imperial Irrigation District. Since the capacity of the CRA is limited to 1.2 MAF, the maximum supply MWD can deliver is limited to 1.2 MAF in any given year, including conveyance obligations. A detailed description of the limitations and management strategy for the CRA can be found in Section 3.1 of MWD's 2015 UWMP.

6.2.3 State Water Project Overview

The SWP is owned by the State of California and operated by the DWR. More than two thirds of California's residents depend on the SWP for a portion of their drinking water. The SWP faces several environmental and water quality challenges as well as concerns about vulnerability to natural disasters.

The 600 mile SWP delivers water to Southern California from Northern California through a series of pump stations, reservoirs and aqueducts. At the hub of the SWP is the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta). The Bay-Delta's declining ecosystem, caused by a number of factors including agricultural runoff and operation of water pumps that can alter the direction of flow, has led to historic restrictions on water supply deliveries from the SWP.

In 1960, MWD signed a contract with DWR to receive water from the SWP. MWD is one of the 29 agencies with long-term contracts for water service from DWR; and it is the largest agency in terms of population served, contracted amount of SWP water (46 percent), and annual payments made to DWR. The original contract MWD held was for 1,911 TAF of SWP water. Before 1994 the SWP water reliability was rapidly deteriorating. MWD estimated its SWP delivery would be reduced to 171 TAF, about 8.9 percent of its SWP contract, under a dry year scenario. After the 1994 Bay-Delta Accord established new operating criteria, DWR estimated that MWD's allocation under a dry year scenario would increase to 418 TAF. Although the Bay-Delta Accord improved conditions, MWD continues to address concerns that threaten reliability in the SWP.

The listing of several species as threatened or endangered in the Bay-Delta region has impacted operations and limited the flexibility of the SWP. Operations have been curtailed due to restrictions put into place to protect Delta smelt, salmon, and other species that spawn in rivers flowing to the Bay-Delta, which are federal and state-listed threatened fish species that inhabit the estuaries of the region. Changes in SWP operation have affected the manner in which water is diverted from the Bay-Delta and have limited deliveries. Between 2008 and 2014, restrictions on Bay-Delta pumping reduced deliveries of SWP

water to MWD by approximately 1.5 MAF. SWP operations may also be restricted by new biological opinions for listed species under the federal Endangered Species Act (ESA) or by the California Department of Fish and Wildlife (CDFW)'s issuance of incidental take authorizations under the California ESA. Additional new litigation, listing of additional species, or new regulatory requirements could also restrict operations and limit water supply. To address potential constraints on the SWP, MWD has developed near- and long-term action plans to increase water supply reliability.

MWD is also working with stakeholders throughout the state to develop and implement long-term solutions to the problem in the Bay-Delta. The Bay Delta Conservation Plan (BDCP) and preferred alternative called the California WaterFix are being prepared through a collaboration of state and federal agencies, local water agencies, environmental organizations, and other interested parties. The purpose is to design physical and operational improvements to the SWP system in the Bay-Delta to improve supply reliability, improve water quality, and restore and protect ecosystem health. In evaluating the supply reliability for the 2015 UWMP, MWD assumed the long-term Bay-Delta improvements would be fully operational by 2030.

In Section 3.2 of MWD's 2015 UWMP, MWD provides details about the planned actions and achievements to date in improving the reliability of the SWP. MWD also describes other challenges affecting the SWP including water quality and climate change.

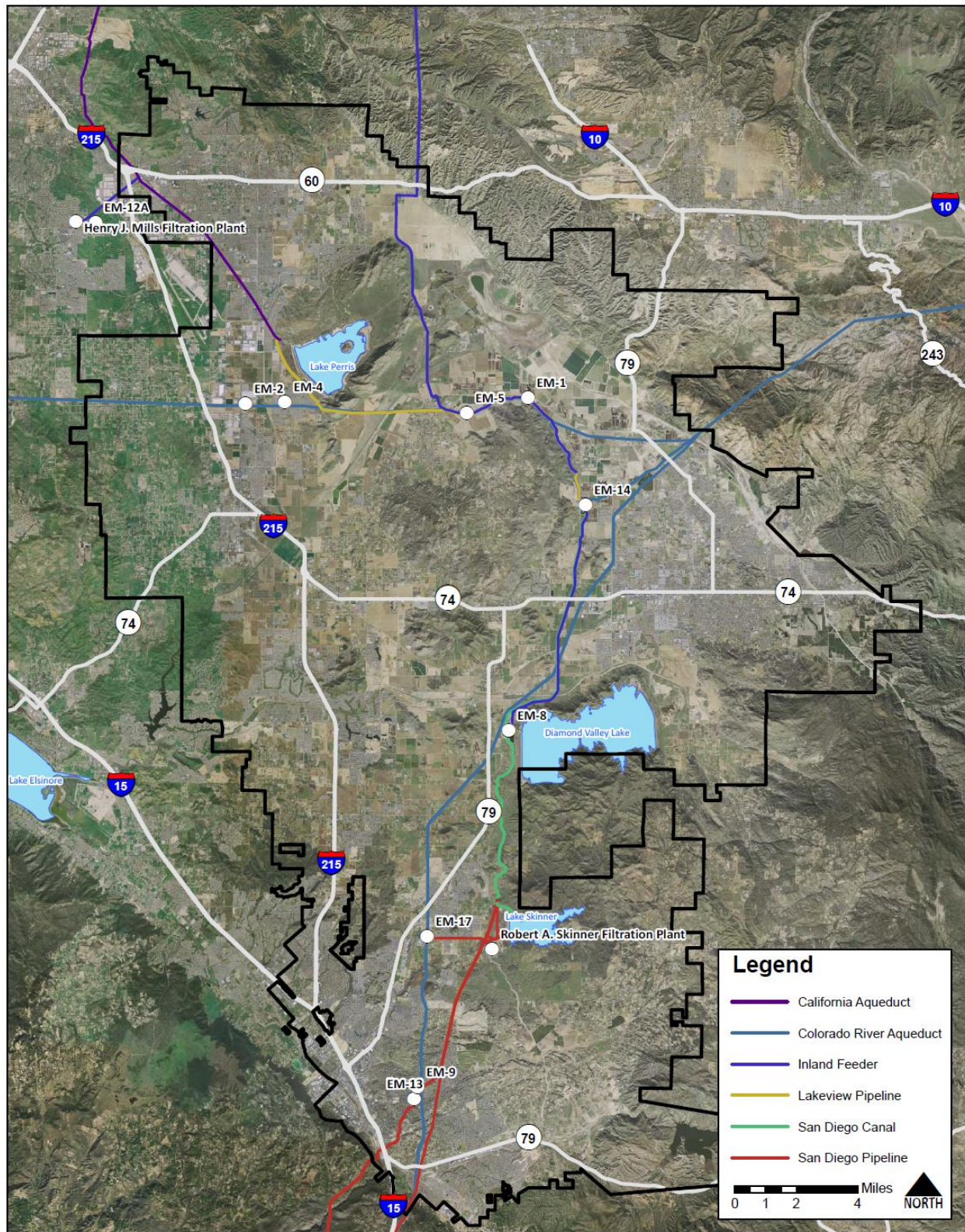
6.2.4 EMWD and MWD

The original mission of MWD was to build the CRA, bringing Colorado River water to Southern California. As MWD was constructing the San Jacinto Tunnel Portion of the project, a large amount of seepage was encountered in the pipeline. As the seepage began to affect local water resources within the region, residents began to organize to protect their water supply. Around the same time, the region experienced a period of dry weather conditions and the groundwater 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 SWP, operated by DWR. In 1972, the SWP began conveying water from the wet climate of northern California to the dry climate of Southern California. Through the 1980s, EMWD built facilities to take advantage of the SWP water available, and today, the largest portion of EMWD's water supply is provided from Northern California. Treated potable water is available in the North from the Mills Water Treatment Plant and in the south through the Skinner Water Treatment Plant. EMWD also owns and operates two water filtration plants that treat raw imported water: Perris Water Treatment Plant and Hemet Water Treatment Plant. Raw imported water is also used for recharge purposes and to meet agricultural demands.

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 MWD's 2015 UWMP. Using information about existing and proposed local projects, MWD then determines the amount of imported water supply and demand. Throughout the preparation of the 2015 UWMP, EMWD has provided to MWD information about local supply and projects, clarifications on boundary information, and population projections. Based on this information and information provided by other member agencies, MWD has determined it is able to meet the demands of all member agencies through 2040.

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



Eastern Municipal Water District
Metropolitan Water District Facilities

6.3 Groundwater

EMWD produces potable groundwater from two management plan areas within the San Jacinto Groundwater Basin. The areas are the West San Jacinto Groundwater Basin Management Plan area (West San Jacinto Basin) and the Hemet/San Jacinto Water Management Plan area (Hemet/San Jacinto Basin). EMWD also owns and operates two desalination plants that convert brackish groundwater from the West San Jacinto Basin into potable water. These plants not only provide a reliable source of potable water, they also protect potable sources of groundwater and support EMWD's groundwater salinity management program.

EMWD is a key player in three cooperative efforts to protect groundwater quality and reliability. The West San Jacinto Basin is subject to the West San Jacinto Groundwater Basin Management Plan (WSJ Management Plan), developed in 1995 and included in Appendix E of this UWMP. The Hemet/San Jacinto Basin is subject to the HSJ Management Plan, developed in 2007 and included in Appendix F of this UWMP. The HSJ Management Plan is implemented by the Hemet-San Jacinto Watermaster (Watermaster). The Watermaster was appointed and supervised by the Superior Court of the State of California for the County of Riverside, pursuant to the Stipulated Judgment entered in April 2013 (Appendix G). Additionally, a subset of participants (EMWD, LHMWD and the Soboba Band of Luiseño Indians [Soboba Tribe]) also actively manage water levels under a separate agreement under the Canyon Operating Plan.

Native potable groundwater production in the Hemet/San Jacinto Basin is limited according to HSJ Management Plan provisions to prevent continued overdraft. EMWD anticipated the limitations on native groundwater production it has experienced and has developed alternatives to assure reliability including an Integrated Recharge and Recovery Program (IRRP), filtration plants to treat and deliver imported water to areas dependent on groundwater, and recycled water use for irrigation of landscape and agriculture. In addition to the existing IRRP, EMWD is developing the Enhanced Recharge and Recovery Program (ERRP) to increase conjunctive use and facilitate groundwater banking. Phase 1 of the ERRP program is included in the Santa Ana River Conservation & Conjunctive Use Program (SARCCUP), a cooperative program to store imported water during wet years for use during dry years. Both management plan areas are part of the San Jacinto Groundwater Basin (DWR Bulletin 118 Groundwater Basin Number 8-05).

Portions of EMWD also overlay the Santa Margarita Valley Groundwater Basin. Pumping from the Santa Margarita Valley Groundwater Basin is not addressed further in this document because EMWD does not extract groundwater from the Santa Margarita Valley Groundwater Basin and has no plans to do so.

6.3.1 Basin Descriptions

The West San Jacinto Basin and the Hemet/San Jacinto Basin are both located within the San Jacinto Groundwater Basin. Groundwater management zones within the San Jacinto Groundwater Basin were delineated based areas of lower groundwater flow, groundwater divides, and changes in groundwater quality (Santa Ana River Basin Plan, 2004 Revision). The Hemet/San Jacinto Basin is comprised of the Hemet South, Canyon, and San Jacinto Upper Pressure Management Zones, as well as the Hemet North portion of the Lakeview/Hemet North Management Zone. The West San Jacinto Basin covers the Perris North, Perris South, San Jacinto Lower Pressure, and Menifee Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone. EMWD produces water for potable use or blending in four of the management zones: Perris North, Hemet South, San Jacinto Upper Pressure and Canyon. Desalter production wells are located in the Perris South and Lakeview/Hemet North Management Zones. The Groundwater Management Zones are outlined in Figure 6-4 and are described below.

Canyon Management Zone

The boundaries of the Canyon Management Zone include the San Jacinto Mountains to the east, north, and south, as well as the San Jacinto fault zone to the west. The San Jacinto Mountains are composed of

consolidated crystalline bedrock and semi-consolidated sedimentary rocks. These rocks are relatively impermeable, providing limited groundwater seepage into the basin and bound the water-bearing, alluvium-filled canyons within this 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 and acts as an impermeable barrier at depth. The barrier effect of the fault forces groundwater upwards within the San Jacinto River upstream of the fault causing muddy areas at the surface. This area is known as the Cienega and is an area of significant municipal groundwater production.

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 Claremont fault is a known barrier to groundwater flow, and separates the San Jacinto Graben from both 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. The Casa Loma and Bautista Creek fault zones are generally known barriers to groundwater flow. However, studies show groundwater leaks across portions of the Casa Loma Fault zones as underflow along 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 Claremont 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. The Casa Loma fault zone is a leaky barrier to groundwater flow to the Perris North Management Zone in this section of the San Jacinto Groundwater Basin. Recharge rates along with water quality differences between San Jacinto Upper Pressure and San Jacinto Lower Pressure characterize the location of the barrier between the two zones.

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 partial barrier to groundwater flow. Generally, groundwater leaks across the fault zone as underflow from the San Jacinto Upper Pressure 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 Hemet South Management Zone boundaries include the Casa Loma and Bautista Creek fault zones to the east; the groundwater divide near Esplanade Avenue to the north; the Lakeview Mountains to the northwest; 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 generally known barriers to groundwater. However, groundwater leaks across portions of the Casa Loma Fault Zone as underflow into the San Jacinto Upper Pressure Management Zone.

Perris North Management Zone

Boundaries of the Perris North Management Zone include the Casa Loma fault to the northeast bordering the San Jacinto Lower Pressure Management Zone; a bedrock constriction to the south bordering the

Perris South Management Zone; the Bernasconi Hills and the Lakeview Mountains to the west; and the bedrock and surrounding hills the north and west. The Casa Loma fault zone is a generally not a barrier to groundwater flow in this section of the fault. Therefore, groundwater leaks across the fault zone as underflow from the San Jacinto Lower Pressure Management Zone.

Lake Perris is located to the east of the Perris North Management Zone and is surrounded by the Bernasconi Hills and Lakeview Mountains to the north, east, and south, and a dam on the west side. Seepage is known to occur under the dam through a subterranean channel into the Perris North 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 seasons, artificial recharge and/or production patterns.

Southwest of EMWD's Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle. 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 bedrock constriction in the water-bearing alluvium is also 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.

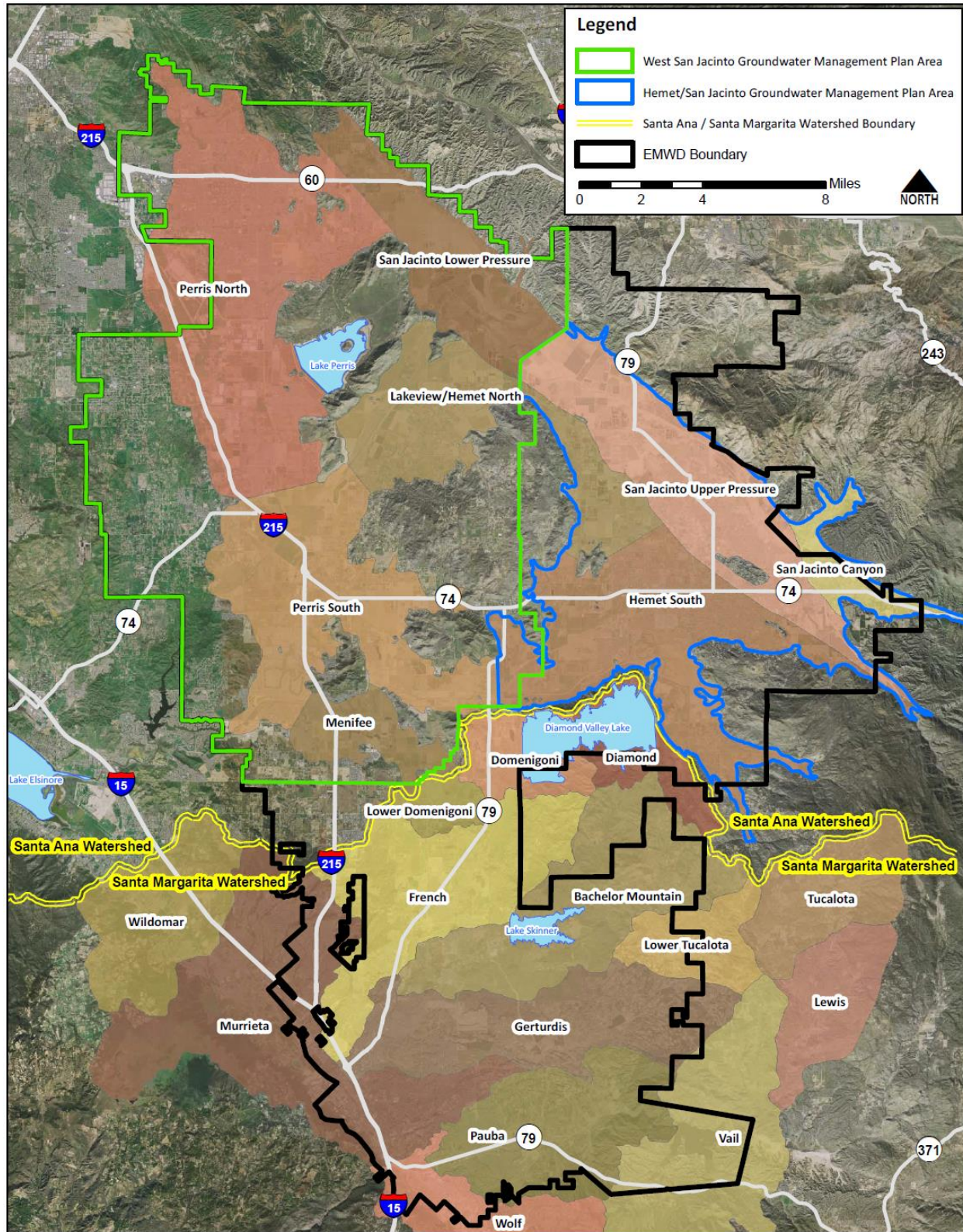
To the northeast, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview Management Zones. Under historic flow conditions,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

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 bedrock constriction in the water-bearing alluvium is also 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. The groundwater management zones in the San Jacinto Watershed within EMWD's service area are shown on Figure 6-4.

Figure 6-4: Groundwater Management Zones



Eastern Municipal Water District
Groundwater Management Zones

6.3.2 Groundwater Management

West San Jacinto Basin

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 WSJ Management Plan in accordance with the statutes in the California Water Code Sections 10750 through 10755 resulting from the passage of AB 3030. The plan was adopted after extensive public outreach and meetings with interested individuals and agencies. A copy of the Management Plan is included in Appendix E.

Implementation of the WSJ Management Plan began directly after its adoption. Initial efforts to implement the WSJ Management Plan included establishing an advisory committee; prioritizing the management zones; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. The West San Jacinto Groundwater Basin Management Plan Annual Report, documenting the implementation of the plan and activities in the groundwater management zones, has been published annually since 1996.

Hemet/San Jacinto Basin

In 2001, the Cities of Hemet and San Jacinto, LHMWD, EMWD, and representatives of the private groundwater producers, with DWR acting as an impartial mediator, began working on a groundwater management plan for the Hemet/San Jacinto Basin. The group discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment and Decree, export of groundwater from the basins, and how to maximize the use of recycled water. As a result of their efforts, a final HSJ Management Plan was completed in 2007 (Appendix F) and a Stipulated Judgment was entered with the Superior Court of the State of California for the County of Riverside in April of 2013 (Appendix G).

The HSJ Management Plan:

- Limits the amount of water being extracted from the basin free of the replenishment charge to a sustainable yield.
- Implements continued recharge of the basin using imported water through the IRRP.
- Ensures settlement claims by the Soboba Tribe are facilitated and accommodated.
- Expands the existing water production and water services system to meet future urban growth through the use of imported water recharged into the basin.
- Protects and/or enhances water quality in the Hemet/San Jacinto Basin.
- Supports cost-effective water supplies and treatment by the public agencies.
- Eliminates groundwater overdraft and enhances basin yield.
- Continues the monitoring program to promote and provide for best management and engineering principles to protect water resources.

Long-term groundwater management includes plans for artificial recharge using MWD replenishment water via permanent facilities through the IRRP Program. An agreement with the Soboba Tribe (described in the following section) requires MWD to deliver, on average, 7,500 AFY of water for the next 30 years to EMWD, LHMWD, and the Cities of Hemet and San Jacinto as part of an effort to recharge groundwater in the Hemet/San Jacinto Basin, fulfilling the Soboba Tribe's water rights and addressing chronic groundwater overdraft.

EMWD's rights under the HSJ Management Plan will be a long-term base groundwater production right of 7,303 AFY. EMWD's base production right will be gradually reduced to the long-term value. In 2015, EMWD's base production right was 9,300 AF, not including previously recharged water credited to it. Any pumping above that amount is subject to replenishment fees.

Soboba Settlement Act

On June 7, 2006, after eleven years of negotiations, the Soboba Tribe, MWD, EMWD, and LHMWD signed the Soboba Band of Luiseño Indians Water Settlement Agreement (Soboba Settlement Agreement) at a 4:00 pm ceremony at The Country Club at Soboba Springs in San Jacinto. Tribal Chairman Robert Salgado, Jr., signed the Settlement Agreement for the Soboba Tribe. A copy of the Agreement is included in Appendix H.

On March 1, 2007, Congresswoman Mary Bono (CA-45) introduced The Soboba Band of Luiseño Indians Settlement Act of 2007 (Soboba Settlement Act) which was co-sponsored by Congressmen Jerry Lewis (R, CA-41), Joe Baca (D, CA-43), and Dale Kildee (D, MI-5), and codifies the agreement between the Soboba Tribe, MWD, EMWD, and LHMWD.

In 2008, Congress passed and the President signed the Soboba Settlement Act that provided to the Soboba Tribe an annual water supply of 9,000 AF, 128 acres of land near Diamond Valley Lake for commercial development, and approves and ratifies the Soboba Settlement Agreement that set forth \$17 million from the local water districts for economic development. Additionally, the United States government provided the Soboba Tribe with \$11 million for water development.

The agreement terminated litigation against MWD and EMWD, which was filed by the Soboba Tribe in April 2000 (Soboba Band of Luiseño Indians v. MWD). The lawsuit sought damages and injunctive relief for the continuing drainage of water from the Soboba Reservation into MWD's nearby San Jacinto Tunnel which was constructed in the 1930s. The bill mandates, on average, an annual delivery of 7,500 AF of water by MWD for the next 30 years to EMWD, LHMWD, and the cities of Hemet and San Jacinto, as part of an effort to recharge the San Jacinto Groundwater Basin, fulfilling the Soboba Tribe's water rights and addressing chronic groundwater overdraft.

As outlined in the Soboba Settlement Act, the cities and agencies also received \$10 million in federal funds to build the facilities to recharge the aquifer with the imported water, and between 6,100 and 4,900 AFY of the Soboba Tribe's water (on a declining scale over a 50 year period) to be used towards basin replenishment. The Soboba Tribe will also make 98 acres of Soboba Reservation land available for endangered species habitat, on an acre for acre basis, to replace EMWD land found to be not suitable for mitigation.

In 2015, the Canyon Operating Plan, an agreement between EMWD, LHMWD and the Soboba Tribe, was completed as a result of a Memorandum of Understanding (MOU) related to the Soboba Settlement Act. The Canyon Operating Plan provides a framework for operating the Canyon Management Zone in a manner to avoid significant impacts to the Soboba Tribe's wells and does not reduce the overall supply available in the Hemet/San Jacinto Basin.

6.3.3 Groundwater Overdraft and Replenishment

The HSJ Management Plan recognizes that the Hemet/San Jacinto Basin is presently in a condition of groundwater overdraft. In 2007, the overdraft was estimated to range from 10,000 to 15,000 AFY. The Watermaster has implemented long-term base production rights that will eliminate overdraft conditions within the Hemet/San Jacinto Basin, with interim production rights that step down gradually. In 2015, EMWD's annual base production right in the Hemet/San Jacinto Basin was 9,300 AF. The long-term annual base production right for EMWD is 7,303 AF.

Through pilot programs and using temporary facilities, EMWD has recharged groundwater in the Hemet/San Jacinto Basin with imported surplus water from MWD since 1990. 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 Basin by providing recharge of imported water from the SWP into the aquifer 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. Approximately 20,819 AF of imported water from the SWP was

recharged into the aquifer in the period spanning from 2004 through 2007. Due to dry conditions, environmental restriction, and the level of demands in its service area, MWD curtailed Replenishment Service effective as of May 1, 2007. Since then, permits to recharge water at the two sites have expired. To replace the temporary recharge facilities, long-term facilities are being operated as part of the IRRP, an integral piece of the HSJ Management Plan and the Soboba Settlement Agreement. The IRRP consists of 35 acres of basins or ponds for recharging SWP from MWD; three extraction wells; three monitoring wells; modification to two existing pump stations; and pipelines within, and adjacent to, the San Jacinto River.

EMWD and the other three local agencies are also contributing to the replenishment of the basin by providing recycled water in lieu of groundwater production. The Recycled In-Lieu Program supplies recycled water for agricultural irrigation in-lieu of pumping native groundwater. The project can deliver up to 8,540 AFY to local agricultural water producers. The project costs are jointly funded by EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Agreements that set limits on groundwater production and provide for a payment of a portion of the operation and maintenance costs have been in place since 2008.

6.3.4 Groundwater Pumping

EMWD has an existing potable well capacity of 43.7 cubic feet per second (CFS). In the Hemet/San Jacinto Basin, well capacity is 35.62 CFS, including three wells dedicated to the IRRP. The IRRP will recharge Soboba Settlement Water into the basin. In the West San Jacinto Basin, there is 8.06 CFS of well capacity. Table 6-3 summarizes the existing potable well capacities that deliver water to EMWD's distribution system.

Table 6-3: Existing Potable Groundwater Production Capability (CFS)

Facility	Capacity
San Jacinto Upper Pressure	
EMWD Wells	12.09
IRRP Wells	10.25
Hemet South	2.03
Canyon	11.25
Perris North	8.06
Total	43.68

EMWD's total potable groundwater extraction varied from a low of 12,037 AFY up to 18,824 AFY from 2011 through 2015. Potable groundwater in the West San Jacinto Basin is monitored by the WSJ Management Plan. There are no restrictions on the amount of water that can be extracted. Current production in the Hemet/San Jacinto Basin is limited by the base production rights set in the HSJ Management Plan and is administered by the Watermaster. Production in recent years is reflective of a reduction in demand due to conservation, economic conditions and weather patterns and not of supply reliability.

The volume of groundwater pumped by EMWD from 2011-2015 is reported in Table 6-4. The volumes in the table include potable groundwater pumped from the Hemet/San Jacinto Basin and the West San Jacinto Basin as well as brackish groundwater pumped from the West San Jacinto Basin that is treated at EMWD's desalters before being used as a potable supply. Brackish groundwater volumes reported in Table 6-4 below are reported as a desalinated water supply in other supply tables of this UWMP (Table 6-1, Table 6-18, and Table 6-20). As documented in Table 6-5, groundwater is not used to meet wholesale demands.

Table 6-4: Retail Groundwater Volume Pumped (AFY)

DWR Table 6-1 Retail: Groundwater Volume Pumped						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) ¹	12,709	10,091	13,828	8,021	9,559
Alluvial Basin	West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	4,756	5,399	4,996	4,016	5,011
Alluvial Basin	Brackish Groundwater from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) ²	7,533	7,139	6,501	9,897	10,089
Total		24,998	22,629	25,325	21,934	24,659

1) There was additional EMWD pumping (641 AF in 2014; 1,284 AF in 2015) in the Hemet/San Jacinto Basin that was wheeled as part of sub-agency groundwater rights under the Hemet/San Jacinto Management Plan.

2) Brackish groundwater pumped from the West San Jacinto Basin is not a direct supply – it is used to feed desalination facilities. The treated volume of this supply is shown in the other supply tables of this chapter as desalinated water instead of groundwater.

Table 6-5: Wholesale Groundwater Volume Pumped

DWR Table 6-1 Wholesale: Groundwater Volume Pumped	
<input checked="" type="checkbox"/>	Supplier does not pump groundwater ¹ .

1) EMWD does not pump groundwater for its wholesale customers.

6.4 Surface Water

EMWD holds a right to divert up to 5,760 AFY of San Jacinto River flows for recharge and subsequent use from September 1st through June 30th each year. EMWD's diversion and recharge of San Jacinto River surface water to the Canyon Management Zone takes place at EMWD's Grant Avenue Ponds in the Valle Vista area. EMWD's diverted water is recharged into the groundwater aquifer of the Canyon Management Zone and is not used for direct use or sale. The San Jacinto River is an ephemeral river and, consequently, river flows may be insufficient for any diversion at all in some years. Water that is recharged helps the regional water balance and contributes to the safe yield of the basin.

6.5 Stormwater

The San Jacinto Water Harvesting Project allows EMWD to capture stormwater for the purposes of recharging the groundwater aquifers in the Hemet/San Jacinto Basin. The San Jacinto Water Harvesting Project uses the San Jacinto Reservoir as a retention basin for flows rerouted from Riverside County Flood Control and Water Conservation District storm drain Line E. The San Jacinto Water Harvesting Project is currently not monitored; however, at time of construction, the project was estimated to capture 300 to 320 AFY of storm water on a long-term average.

Additionally, the planned ERRP project, discussed in Section 6.9, may have a stormwater capture component.

6.6 Desalinated Water

EMWD currently uses groundwater desalination to remove salts from basins in the West San Jacinto Basin. This 250 square mile area experiences increasing water levels due to the inward migration of high total dissolved solids (TDS) groundwater and decreased production. The high TDS groundwater is

migrating into the Lakeview portion of the Lakeview/Hemet North Management Zone, which is an area of good quality groundwater. Lowering groundwater levels and removal of saline groundwater is an integral element of the WSJ Management Plan. To address these concerns, EMWD implemented a Groundwater Salinity Management Program. This program currently consists of two desalination facilities owned and operated by EMWD. These facilities recover high TDS groundwater from the Menifee and Perris South Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone, for potable use. In addition to being a source of potable water, the main role of the desalters is to play a part in managing the groundwater management zones by addressing the migration of brackish groundwater into areas of good quality groundwater.

Desalter wells pump water to an integrated brackish water system that delivers water to the desalination plants where it is treated prior to entering the distribution system. The Menifee Desalter was the first desalter to be built. This facility began producing potable water in 2003. The second desalter, the Perris I Desalter, is located next to the Menifee Desalter in Sun City. This plant began production in 2006 and has a production capacity of 10.5 CFS. Groundwater extraction for use in the desalter program has caused local declines in water levels to date; but the overall West San Jacinto Basin shows groundwater levels that continue to exhibit a stable or upward trend.

High iron and manganese concentrations along with silica irreversibly impact the desalter membranes and have resulted in several brackish groundwater extraction wells being offline. In 2004, an effort was initiated to evaluate alternative technologies for removal of iron and manganese prior to desalination. In late 2013, iron and manganese removal facilities were placed online and allowed EMWD to begin producing from four previously inactive wells. Around 9,000 AF of brackish groundwater was pumped in 2014 and 2015, which fed roughly 7,000 AF of potable water into the retail system, a significant increase over the 4,800 AF of potable water generated from the desalters in 2013.

EMWD has designed a third desalter, the Perris II Desalter, which will be located across the street from the existing desalters to the north. The Perris II Desalter is designed to have a capacity of 3.5 to 5.4 million gallons per day and is scheduled to be built in two phases, with the first coming online sometime in the 2020 to 2025 timeframe.

6.7 Wastewater and Recycled Water

EMWD provides wastewater collection, treatment, and recycled water services throughout its service area. Recycled water is extensively used in EMWD's service area to meet non-potable demands. The supply of recycled water will continue to increase with EMWD's population size (though it is also impacted by conservation measures). The four RWRFs that EMWD operate have recently completed expansions. Recycled water is currently used for both municipal and agricultural purposes. Municipal customers use recycled water for landscape irrigation and industrial process water. Agricultural customers use recycled water for irrigation of crops. A portion of agricultural demand for recycled water is provided in-lieu of using groundwater. Due in part to drier conditions and higher demands, EMWD has been able to meet its goal of eliminating discharges and using all of the recycled water available within EMWD for the past two years. Some of the recycled water use offsets demands of existing potable customers.

6.7.1 Recycled Water Planning and 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 was formally updated in 2010. In 2009, EMWD completed a Recycled Water System Strategic Plan that provides guidelines for moving forward with recycled water projects. Information from the strategic plan was incorporated into the EMWD Integrated Resource Plan (IRP) to evaluate potential recycled water projects. EMWD is in the process of updating all three planning efforts with the development of its 2015

Recycled Water Strategic and Master Plan and its 2015 IRP. EMWD's local water recycling plan is also incorporated into the 2014 IRWM Plan developed by SAWPA for the Santa Ana River Watershed.

EMWD 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 analysis for impacted surface waters in the Santa Ana River Watershed.

EMWD is involved with a variety of local agencies and public interest groups in recycled water planning efforts and has coordinated these agencies as part of the development of this UWMP as explained in *Chapter 2 – Plan Preparation*. Table 6-6 lists agencies participating in recycled water planning.

Table 6-6: Recycled Water Coordinating Agencies

Group/Agency	Role
1) Santa Ana Watershed Project Authority	Regional Cooperative Planning
2) Santa Ana Regional Water Quality Control Board	Basin Planning / Salinity Management.
3) Rancho California Water District	Facility Planning / Market Development
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 Development
7) EMWD Recycled Water Advisory Committee	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 / Funding

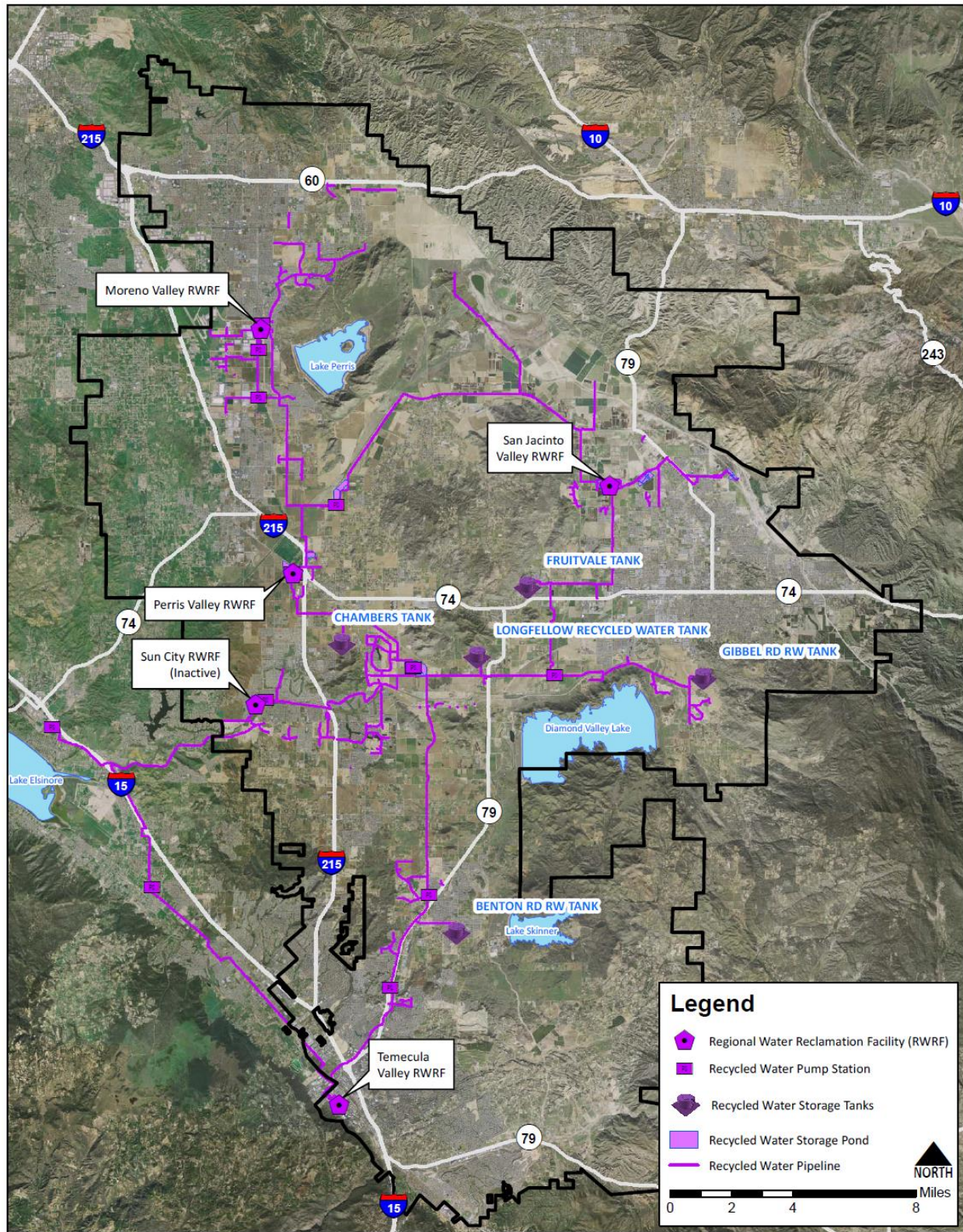
6.7.2 Wastewater Collection, Treatment, and Disposal

EMWD is responsible for all wastewater collection and treatment in its service area. It has four operational RWRFs located throughout EMWD as shown in Figure 6-5. Inter-connections between the local collections systems serving each treatment plant allow for operational flexibility, improved reliability, and expanded deliveries of recycled water. All of EMWD's RWRFs produce tertiary effluent, suitable for all Department of Health Services permitted uses, including irrigation of food crops and full-body contact. The four RWRFs have a combined capacity of 81,800 AFY as summarized in Table 6-7.

Table 6-7: RWRf Treatment Capacity (AFY)

Facility	Treatment Capacity (AFY)
San Jacinto Valley	15,700
Moreno Valley	17,900
Temecula Valley	20,200
Perris Valley	28,000
Total	81,800

Figure 6-5: Key Recycled Water Facilities



Eastern Municipal Water District
Key Facilities - Recycled Water

In addition to treatment facilities, EMWD has several recycled water storage ponds throughout EMWD (see Figure 6-5). Using existing storage ponds, EMWD is able to sell more than 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 some degree of incidental groundwater recharge. If storage capacity is full, surplus recycled water is disposed of through a regional outfall pipeline to Temescal Creek and the Santa Ana River.

EMWD treats all of the wastewater collected in its service area to tertiary standards and disposes of its recycled water in one of three ways; 1) customer sales 2) discharge to Temescal Creek, or, 3) through percolation and evaporation while stored in ponds throughout EMWD. In 2015, EMWD collected and treated a total of 48,665 AF of wastewater at its four RWRFs. Table 6-8 and Table 6-9 summarize the amount of wastewater collected and treated in EMWD's service area in 2015. While EMWD sells recycled water to wholesale customers RCWD and EVMWD, the recycled water originates from wastewater collected and treated within EMWD's retail service area. Therefore, these volumes are accounted for in Table 6-9. EMWD does not provide supplemental treatment to the recycled water it distributes as documented in Table 6-10.

Table 6-8: Wastewater Collected within EMWD's Service Area

DWR Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
100	Percentage of 2015 service area covered by wastewater collection system					
100	Percentage of 2015 service area population covered by wastewater collection system					
Wastewater Collection			Receiving Wastewater Treatment			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015 ¹	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
Eastern Municipal Water District	Metered	7,382	Eastern Municipal Water District	San Jacinto Valley RWRf	Yes	No
Eastern Municipal Water District	Metered	12,389	Eastern Municipal Water District	Moreno Valley RWRf	Yes	No
Eastern Municipal Water District	Metered	15,088	Eastern Municipal Water District	Temecula Valley RWRf	Yes	No
Eastern Municipal Water District	Metered	13,806	Eastern Municipal Water District	Perris Valley RWRf	Yes	No
Total Wastewater Collected from Service Area in 2015:		48,665				

1) Total listed under "Volume of Wastewater Collected from UWMP Service Area 2015" differs from total listed under "Wastewater Treated" in DWR Table 6-3 due to losses in the treatment process.

Table 6-9: Wastewater Treatment and Discharge within EMWD's Service Area

DWR Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier ¹	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
						Wastewater Treated ²	Discharged Treated Wastewater	Recycled Within Service Area ^{3,4,5}	Recycled Outside of Service Area
San Jacinto Valley RWRF	Reach 4 Dissipater	Temescal Creek	River or creek outfall	No	Tertiary	6,884	0	5,157	0
Moreno Valley RWRF	Reach 4 Dissipater	Temescal Creek	River or creek outfall	No	Tertiary	11,554	0	8,656	0
Temecula Valley RWRF	Reach 4 Dissipater	Temescal Creek	River or creek outfall	No	Tertiary	14,071	0	10,542	0
Perris Valley RWRF	Reach 4 Dissipater	Temescal Creek	River or creek outfall	No	Tertiary	12,876	0	9,646	0
Total						45,385	0	34,001	0

- 1) All four of EMWD's RWRFs are connected through EMWD's regional recycled water system with one discharge point.
- 2) Total listed under "Wastewater Treated" differs from the total listed under "Volume of Wastewater Collected in 2015" in DWR Table 6-2 due to losses occurring during the treatment process.
- 3) Because all four RWRF's are connected through one regional recycled water system, it is not possible to distinguish the volume of water recycled from each individual facility. Volumes recycled from each facility in the table were estimated based on the proportion of wastewater collected and treated at each plant compared to the total volume of wastewater treated.
- 4) The balance between the total "Wastewater Treated" and the total volume "Recycled within Service Area" represents EMWD's system losses (such as storage pond evaporation and incidental recharge).
- 5) Recycled water sold to RCWD and EVMWD is included in the total volume recycled within EMWD's service area and not reported separately in DWR Table 6-3 for wholesale. Recycled water deliveries to wholesale customers are distinguished from retail sales in DWR Table 6-4.

Table 6-10: Wastewater Treatment and Discharge Within EMWD's Wholesale Service Area

DWR Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015	
<input checked="" type="checkbox"/>	Wholesale supplier does not provide supplemental treatment to recycled water it distributes ¹ .

1) EMWD sells recycled water to wholesale customers RCWD and EVMWD. These volumes are accounted for in the wastewater treated, discharged, and recycled in DWR Table 6-3 for retail.

6.7.3 Recycled Water System

In 2015, EMWD produced 45,385 AF of recycled water for distribution to retail and wholesale customers throughout its service area. System losses such as storage pond evaporation and incidental recharge accounted for 11,384 AF of this quantity, and the remainder was available as a supply. The majority of recycled water sold is used for agricultural irrigation. A portion of the water sold for agriculture is used in lieu of groundwater, preserving the groundwater basin and improving water supply reliability. In addition to meeting agricultural demand, recycled sales to municipal customers are increasing rapidly as residential and urban development replaces irrigated farmland. Landscape irrigation is an emerging market and in 2008, EMWD started selling recycled water to a large industrial customer for cooling towers in a power generation plant. EMWD also sells recycled water to the CDFW for environmental use within the San Jacinto Wildlife Area and to recreational customers that are comprised of private duck clubs and bird sanctuaries that use recycled water for ponds. EMWD uses existing storage facilities to store water during off peak periods for delivery in peak months and maximize the amount of recycled water sold. EMWD's current and projected retail recycled water sales are summarized in Table 6-11.

Much of EMWD's increase in recycled water use will come from customers that will use recycled water for landscape irrigation or industrial processing. Agricultural use is projected to decrease as more agricultural land use is converted to residential. Currently, agricultural customers use recycled water to grow short-term row crops. Using potable water would not be cost-effective and their profitability is based on the availability of low-cost recycled water and low-cost land available for lease. The location of these agricultural accounts frequently changes each year depending on land availability. As more residential development takes place and the population grows, land is becoming less accessible for agricultural use. In the future, EMWD expects to have fewer and fewer agricultural accounts. Other agricultural accounts use recycled water to irrigate crops that require a long-term investment such as citrus trees. These accounts would use potable water, if needed, to protect their investment. Recycled water is also being used by some agricultural accounts in lieu of potable ground water.

EMWD's wholesale customer category consists of recycled water delivered to other agencies for use in their service areas. EMWD delivers recycled water to EVMWD and RCWD. EMWD's wholesale current and projected recycled water use is shown in Table 6-12.

Table 6-11: Current and Projected Retail Recycled Water Direct Beneficial Uses (AFY)

DWR Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area								
Name of Agency Producing (Treating) the Recycled Water:		Eastern Municipal Water District						
Name of Agency Operating the Recycled Water Distribution System:		Eastern Municipal Water District						
Supplemental Water Added in 2015 ¹		682 AF						
Source of 2015 Supplemental Water		Raw, Brackish Groundwater from the West San Jacinto Basin						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040
Agricultural irrigation		Tertiary	22,979	18,784	17,912	17,784	17,756	17,756
Landscape irrigation (excludes golf courses)		Tertiary	2,464	5,124	6,124	7,124	8,124	9,624
Golf course irrigation		Tertiary	1,572	2,375	2,750	3,125	3,500	3,500
Commercial use		Tertiary	0	300	300	300	300	300
Industrial use		Tertiary	1,067	2,912	3,348	3,784	4,220	4,220
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment		Tertiary	1,177	1,250	1,400	1,400	1,400	1,400
Wetlands or wildlife habitat		Tertiary	3,507	4,500	4,500	4,500	4,500	4,500
Groundwater recharge (IPR)* ¹								
Surface water augmentation (IPR)*								
Direct potable reuse								
Other (Provide General Description)								
Total:			32,766	35,245	36,334	38,017	39,800	41,300
*IPR - Indirect Potable Reuse								

1) Raw, brackish groundwater from the West San Jacinto Basin was used in the recycled water system in 2015 to help meet higher than average agricultural demands for recycled water. This volume was removed from the agricultural beneficial uses volume in the table above.

2) Additional recycled water supply is available to EMWD from 2020 through 2040 that is planned for IPR. This volume is not included in the table as a projected beneficial use as IPR is still a conceptual project. The available supply will be redirected to other demands, including agricultural irrigation and landscape irrigation, if the IPR project is not implemented.

Table 6-12: Current and Projected Wholesale Recycled Water Direct Beneficial Uses (AFY)

DWR Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area							
Name of Receiving Supplier or Direct Use by Wholesaler¹	Level of Treatment	2015	2020	2025	2030	2035	2040
Elsinore Valley Municipal Water District	Tertiary	251	289	400	400	400	400
Rancho California Water District	Tertiary	984	1,367	4,366	4,783	5,200	5,200
Total		1,235	1,656	4,766	5,183	5,600	5,600

6.7.4 Planned Versus Actual Recycled Water Use

In 2015, EMWD delivered approximately 32,766 AF to retail customers. This is 134 AF less than projected in the 2010 UWMP, as shown in Table 6-13. Agricultural irrigation was higher than projected in 2010, which may be due to drought conditions increasing evapotranspiration. Additionally, the anticipated demands for the CDFW's San Jacinto Wildlife Area have increased since 2010. However, Landscape irrigation use was less than were projected in 2010, likely due to mandatory restrictions on outdoor water use decreasing irrigation demands across EMWD's service area.

EMWD has continued to increase the percentage of recycled water sold and decrease the amount of recycled water discharged. This was achieved through implementing operational practices that encourage the storage of water in the winter for use during peak periods. Recycled water was also used to recharge groundwater basins through an in lieu agricultural program. EMWD is aggressively pursuing recycled water policies and programs that reduce discharge and increase recycled water use.

Table 6-13: 2010 UWMP Retail Recycled Water Use Projection Compared to 2015 Actual

DWR Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual			
Use Type		2010 Projection for 2015	2015 Actual Use
Agricultural irrigation		20,000	22,979
Landscape irrigation (excludes golf courses)		5,100	2,464
Golf course irrigation		--	1,572
Commercial use		--	--
Industrial use		5,800	1,067
Geothermal and other energy production		--	--
Seawater intrusion barrier		--	--
Recreational impoundment		--	1,177
Wetlands or wildlife habitat		2,000	3,507
Groundwater recharge (IPR)		--	--
Surface water augmentation (IPR)		--	--
Direct potable reuse		--	--
Other		--	--
Total		32,900	32,766

In EMWD's 2010 UWMP, recycled water wholesale deliveries were not projected for 2015. Actual 2015 recycled water wholesale deliveries to RCWD and EVMWD are shown in Table 6-14.

Table 6-14: 2010 UWMP Wholesale Recycled Water Use Projection Compared to 2015 Actual

DWR Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015¹	2015 Actual Use
Elsinore Valley Municipal Water District	--	251
Rancho California Water District	--	984
Total	0	1,235

1) Projections for wholesale recycled water deliveries were not provided in the 2010 UWMP.

6.7.5 Actions to Encourage and Optimize Future Recycled Water Use

EMWD is in the process of completing its 2015 Recycled Water Strategic and Master Plan. The plan examines several options for the expansion of recycled water use in EMWD's service area and considers the current and potential constraints and opportunities for reducing discharge and increasing use of recycled water. Demand opportunities exceed projected supply through 2045, so an optimized profile of demands will be recommended as part of the strategic plan evaluation.

Historically, EMWD has used recycled water to meet the needs of agricultural development with increasing landscape demand, as land use changes from agricultural to urban. Water has also been used for environmental purposes at the CDFW's San Jacinto Wildlife Area. Recently, new demands have emerged for manufacturing and industrial processes and for use in lieu of groundwater. Other proposed special projects include Indirect Potable Reuse (IPR) using recycled water from the San Jacinto Valley RWRf for groundwater recharge.

IPR is included in EMWD's IRP and modeled under several hydraulic and supply conditions. EMWD's Recycled Water Strategic and Master Plan also evaluates the storage and system improvements needed to offset peak demand. Additional storage is not required to fully utilize EMWD's recycled water supply.

To ensure that recycled water continues to be used to the fullest extent possible, EMWD uses five methods to expand the use of recycled water within its service area. These methods are:

Mandatory Recycled Water Use Ordinance – EMWD 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 and providing recycled water for permitted uses.

Rate Incentives – Recycled water is currently priced below the cost of potable water for both municipal and agricultural use.

Water Supply Assessments – EMWD's Water Supply Assessments require 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 use of recycled water with its water education program. EMWD also places prominent signage at public recycled water use sites promoting the benefits of water recycling.

Facilities Financing – EMWD will work with private parties to arrange or provide financing for construction of facilities needed to convert potable demands 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 EMWD's Recycled Water Use Ordinance will play a major role in program expansion. Table 6-15 summarizes EMWD's methods to expand future retail recycled water use.

Table 6-15: Methods to Expand Future Recycled Water Use

DWR Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use¹
Mandatory Recycled Water Use Ordinance	The ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available	Ongoing	2,703
Rate Incentives	EMWD prices recycled water below the cost of potable water for both municipal and agricultural use	Ongoing	2,703
Water Supply Assessments	Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted	Ongoing	2,703
Public Education	EMWD has a recycled water public education campaign to promote the benefits of recycled water	Ongoing	2,703
Facilities Financing	EMWD helps arrange or provide financing for the construction of facilities needed to convert potable demands to recycled water	Ongoing	2,703
Total			13,515

1) 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 EMWD's Recycled Water Use Ordinance will play a major role in program expansion.

6.8 Exchanges or Transfers

The five regional water agencies in the Santa Ana River Watershed have identified a watershed-scale project to store imported water during wet years in order to help meet dry-year demands, called SARCCUP. The group includes representatives from the following regional water agencies:

- Eastern Municipal Water District
- Inland Empire Utilities Agency
- Orange County Water District
- San Bernardino Valley Municipal Water District
- Western Municipal Water District

The program goals of SARCCUP include:

- Providing watershed-wide benefits based upon regional collaboration
- Creating significant new dry-year yield (about 70,000 AFY in Phase 1)
- Increasing resiliency and reliability of water supply

The SARCCUP includes four separate groundwater banks. The total storage proposed in Phase 1 of the program is about 180,000 AF. Each of the banks is expected to be able to recharge and extract one-third of its storage capacity in any year. The combined extraction capacity is 60,000 AFY. Since the participants are sharing the benefits equally, each agency receives 20 percent (1/5) of the total capacity, resulting in each of the SARCCUP agencies receiving 12,000 AFY of new dry-year yield. This will

require transfers, in-lieu, or exchanges between the five agencies in both wet and dry years. Phase 1 of EMWD's ERRP will be constructed as EMWD's contribution to the SARCCUP.

In early 2016, SAWPA was formally notified that it had been awarded \$64,268,000 by DWR for its Proposition 84 2015 IRWM grant proposal, which included the SARCCUP. From the grant, SAWPA governance designated \$55 million for SARCCUP implementation. The SARCCUP Proposition 84 grant award includes the development of a Watershed-Scale Master Plan which encompasses the proposed SARCCUP facilities, and identifies additional facilities that could be included in future phases of the program. The total cost of Phase 1 of the SARCCUP program is just over \$100 million.

The SARCCUP agencies will continue work to finalize all of the individual agreements needed to facilitate construction, implementation, funding, and operations of the facilities and water purchases. These agreements would be presented to EMWD's Board for approval prior to completion of the SARCCUP facilities. Other agreements needed for the program include an agreement between the SARCCUP agencies and MWD to allow MWD facilities to be used to transfer water between the agencies under specified conditions, such as during droughts and emergencies.

6.9 Future Water Projects

6.9.1 EMWD Strategic Master Planning

EMWD is in the process of completing master planning documents for wastewater, water and recycled water supplies and facilities. The Water Supply Strategic Plan and Recycled Water Strategic and Master Plan build on EMWD's 2008 IRP to map out guidelines for EMWD's supply portfolio through build-out. The Water Supply Strategic Plan evaluated EMWD's demand assumptions and supply alternatives for potable water. The analysis covered the relative performance of different supply portfolios under different assumptions and determined a superior alternative. Scoring criteria included:

- Cost effectiveness
- System reliability
- Adaptability
- Water Quality
- Drought Reliability

EMWD will expand desalting, local treatment of imported water, and increase the amount of water being delivered from both the Mills and Skinner Water Treatment Plants.

The Recycled Water Strategic and Master Plan examines several options for the expansion of recycled water use in EMWD's service area and considers the current and potential constraints and opportunities for reducing discharge and increasing use of recycled water.

EMWD's expected future water supply projects and programs are discussed in the sections below. Those projects that have a quantifiable increase in supply and are reasonably expected to be implemented over the next 25 years are summarized in Table 6-16 and

Table 6-17 for EMWD's retail and wholesale systems. While other projects and programs are likely to be implemented in the future, they were not included in EMWD's supply projections and are, therefore, not quantified in Table 6-16 and Table 6-17.

6.9.2 Full Utilization of Recycled Water

The 2008 IRP results demonstrated the benefit of expanding the use of recycled water and examined multiple options for expanding the recycled water program, allowing for flexibility in implementation as EMWD's demands increase. The Recycled Water Strategic and Master Plan built on the earlier IRP and examines several options for the expansion of recycled water use in EMWD's service area. The plan considers the current and potential constraints and opportunities for reducing discharge and increasing use of recycled water.

Using EMWD's entire recycled water supply to offset demand for potable water will decrease the dependence of EMWD on imported water supplies and provide additional supply reliability. Several recycled water projects have been identified as candidates to assist EMWD in meeting its water supply goal. These potential projects include IPR, using advanced treated water for recharge of groundwater basins in the Hemet/San Jacinto area.

In addition to IPR, storage and/or augmentation is needed to offset the balance between winter and summer demands and fully utilize recycled water. As EMWD continues to invest in the development of the recycled water program, reliability will improve and all the recycled water produced by EMWD's treatment plants will be utilized. As recycled water is produced year-round, during all climate conditions, the supply can be used during average, dry, and multi-dry years.

6.9.3 Expanded Desalter Program

EMWD has an existing desalination program that recovers high TDS groundwater from the Menifee and Perris South Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone, for potable use. A third desalination plant, the Perris II Desalter, has been designed and is projected to be online in 2020. The Perris II Desalter is expected to provide 3,000 to 6,000 AFY of potable supply.

A fourth desalter could be warranted to meet salinity management requirements for the Hemet/San Jacinto Basin. The requirement to reduce salinity associated with the use of recycled water could also be met with the implementation of the IPR project.

6.9.4 Local Groundwater Banking

EMWD has initiated a groundwater banking project under the ERRP. The ultimate goal of the ERRP is to overcome up to three years of MWD cutbacks during drought years through the conjunctive use of groundwater. Lower cost imported water is to be recharged during wet years and pumped during dry years. Conceptually, new facilities may include a new MWD turnout, raw water pipeline, three recharge sites with the option to capture stormwater, and 11 new production wells. The San Jacinto portion of the ERRP is expected to provide an additional 45,000 AFY of potable supply during dry years. The first Phase of the ERRP will be EMWD's contribution to the SARCCUP program as discussed in Section 6.8.

6.9.5 Groundwater Development Programs

EMWD has initiated two programs to develop new groundwater supplies within the West San Jacinto Basin. Up to three new wells will be completed as part of the Moreno Valley Groundwater Development Program. Long-term estimates of groundwater yield in the area show that up to 2,000 AFY are available in the Moreno Valley area, which currently has limited pumping and rising groundwater levels. One of the new wells will replace an old EMWD well that collapsed. Within the northern portion of the City of Perris, EMWD is planning one new well under the North Perris Groundwater Development Program, which will augment the District's existing wells in the area and optimize production capabilities in an area of rising groundwater levels within the Perris North Groundwater Management Zone. The targeted yield of the North Perris Groundwater Development Program is 1,000 AFY.

6.9.6 Water Transfers

EMWD currently relies on MWD for any transfers or exchanges. As a member agency, EMWD benefits from MWD's efforts to improve supply reliability through transfers and exchanges, as detailed in MWD's 2015 UWMP.

In addition to relying on MWD, water transfers have been identified as a method of improving reliability, especially during periods of water shortage. As explained in Section 6.8, EMWD is one of five agencies developing the SARCCUP. This water banking program will recharge imported water in local groundwater basins in wet years for use in dry years. This will require transfers or exchanges between the five agencies in both wet and dry years. The SARCCUP agencies will continue work to finalize all of the

individual agreements needed to facilitate construction, implementation, funding, and operations of the facilities and water purchases.

Table 6-16: Expected Future Retail Water Supply Projects or Programs

DWR Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
Name of Future Projects or Programs	Joint Project with other agencies?		Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
	Y/N	If Yes, Agency Name				
San Jacinto ERRP ^{1,2}	Yes	Inland Empire Utilities Agencies, Orange County Water District, San Bernardino Valley Municipal Water District, Western Municipal Water District, DWR	Project to be completed in phases and includes conjunctive use of groundwater recharge and stormwater capture.	2020	Multi-Dry Year	45,000 AFY
Moreno Valley Groundwater Development	No	--	Completion of up to 3 new wells in the Moreno Valley area	2020	Average Year	2,000 AFY
North Perris Groundwater Development	No	--	Completion of a new well in the North Perris area	2020	Average Year	1,000 AFY
Perris II Desalter	Yes	Army Corps of Engineers	Project includes 4 new wells, 2 of which will be drilled by Army Corps of Engineers	2020	Average Year	3,000-6,000 AFY
Full Utilization of Recycled Water (Potential IPR) ³	No	--	Advanced treated recycled water used to recharge the Hemet/San Jacinto Basin	2020-2040	Average Year	18,500

1) EMWD is planning on meeting future demands with additional imported water. Implementation of future water supply projects or programs would be expected to result in reduced imported water usage with the exception of the ERRP project. The ERRP will include the use of imported water stored for dry weather use.

2) Phase 1 of the ERRP is EMWD's contribution to the SARCUPP. In addition to partnering with the SAWPA agencies, coordination will be required with the Hemet-San Jacinto Watermaster.

3) While the implementation of IPR is a potential future supply project, the volume is not included in EMWD's supply projections in DWR Table 6-9 for retail.

Table 6-17: Expected Future Wholesale Water Supply Projects or Programs

DWR Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs	
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply.

1) EMWD's future supply projects are included in DWR's Retail Table 6-7. Future wholesale demands are expected to be met with imported water.

6.10 Summary of Existing and Planned Sources of Water

As described throughout this chapter, EMWD has developed a number of local supplies to offset imported water demand including recycled water, groundwater, and desalinated groundwater. EMWD's planned supply projects will increase supply reliability to mitigate against impacts to supply during dry and multi-dry years as described in *Chapter 7 – Water Supply Reliability Assessment*. Table 6-18 through Table 6-21 summarize EMWD's retail and wholesale current and projected supplies.

Table 6-18: Retail Water Supplies – Actual (AFY)

DWR Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Purchased or Imported Water	Treated water purchased from MWD	36,828	Drinking Water
Purchased or Imported Water	Untreated water purchased from MWD, treated at EMWD Filtration Plants	18,628	Drinking Water
Purchased or Imported Water	Raw Water for Agriculture	941	Raw Water
Groundwater	Potable water pumped from the Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	9,559	Drinking Water
Groundwater	Potable water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	5,011	Drinking Water
Groundwater ¹	Brackish water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) used to supplement the recycled water system	682	Raw Water
Desalinated Water ²	Desalinated water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	7,288	Drinking Water
Recycled Water	Includes Storage Pond Incidental Recharge / Evaporation	44,150	Recycled Water
Total		123,087	

1) In 2015, brackish groundwater from the West San Jacinto Basin was used to supplement the recycled water system.

2) Desalinated water is brackish groundwater pumped from the West San Jacinto Basin that has been desalinated to provide drinking water quality. The volume in the table reflects the volume after treatment that is available for potable supply. The 2015 volume pumped from the basin before treatment was reported in DWR Table 6-1 as brackish groundwater.

Table 6-19: Wholesale Water Supplies – Actual (AFY)

DWR Table 6-8 Wholesale: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Purchased or Imported Water	Treated Water purchased from MWD	6,532	Drinking Water
Purchased or Imported Water	Raw Water purchased from MWD	15,236	Raw Water
Recycled Water		1,235	Recycled Water
Total		23,003	

Table 6-20: Retail Water Supplies – Projected (AFY)

DWR Table 6-9 Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2020	2025	2030	2035	2040
Purchased or Imported Water	MWD Treated/ Untreated	73,697	81,597	92,997	104,097	114,597
Purchased or Imported Water	Soboba Settlement Water ¹	7,500	7,500	7,500	7,500	7,500
Groundwater	Pumped from the Hemet/San Jacinto Basin	7,303	7,303	7,303	7,303	7,303
Groundwater	Pumped from the West San Jacinto Basin	5,000	5,000	5,000	5,000	5,000
Desalinated Water ²	Desalinated water from the West San Jacinto Basin	7,000	10,100	10,100	10,100	10,100
Recycled Water	Includes Storage Pond Incidental Recharge / Evaporation	45,245	48,334	50,017	51,800	53,300
Total		145,745	159,834	172,917	185,800	197,800

1) 7,500 AFY is the annual amount delivered by MWD to meet the Soboba Settlement Agreement. This water is delivered to EMWD as the member agency of MWD but the groundwater supplies that result from this recharged water are divided between the Soboba Tribe and the participants of the Hemet/San Jacinto Management Plan.

2) Desalinated water is brackish groundwater pumped from the West San Jacinto Basin that has been desalinated to provide drinking water quality.

Table 6-21: Wholesale Water Supplies – Projected (AFY)

DWR Table 6-9 Wholesale: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2020	2025	2030	2035	2040
Purchased or Imported Water	MWD Treated/ Untreated	50,500	54,100	57,700	61,200	64,800
Recycled Water		1,656	4,766	5,183	5,600	5,600
Total		52,156	58,866	62,883	66,800	70,400

6.11 Climate Change Impacts to Supply

EMWD has considered the impact of climate change on water supplies as part of its long-term strategic planning. Climate change has the potential to affect not only local demand and supplies, but to reduce the amount of water available for import. Warmer temperatures will lead to higher demand for water within EMWD's service area and throughout California. An increase in intensity and frequency of extreme weather events can impact both local and imported supplies. EMWD gets the majority of its supply from MWD which imports water from the Bay-Delta system through the SWP. Rising sea levels can increase the risk of damage to the Bay-Delta from storms and erosion of levees which decreases imported water reliability.

In its climate change vulnerability assessment for the Santa Ana River Watershed (2014), the SAWPA Region identified key supply vulnerabilities to climate change. The vulnerabilities identified in the assessment related to EMWD's supplies include:

- Reduction in the Sierra Nevada snowpack;
- Increased strain on imported supplies
- Inability to meet water demands during drought
- Shortage of long-term water storage

One of the outcomes of climate change could be more frequent limitations on imported supplies. To limit the impact of climate change, EMWD's long-term planning focuses on the development of reliable local resources and the implementation of water use efficiency. This includes the full utilization of recycled water and the recharge of local groundwater basins to increase supply reliability during periods of water shortage. EMWD is also focused on reducing demand for water supplies, especially outdoors. Increasing the use of local resources and reducing the need for imported water has the dual benefit of not only improving water supply reliability, but reducing the energy required to import water to EMWD's service area.

6.12 Energy Intensity of Water Supplies

In 2014, EMWD completed its Energy Management Plan. This plan provides a comprehensive assessment of EMWD's current and future energy portfolio and provides assistance in developing a road map to meet EMWD's strategic objective of reducing cost while meeting regulatory requirements and maximizing available resources. It evaluated several options to improve EMWD's energy efficiency and developed an implementation plan. The plan included:

- Process Optimization at Perris Valley RWRP;
- Converting Internal Combustion Engines, where cost effective;
- Equipment and Process Optimization at Perris Water Treatment Plant;
- Install microturbines at Perris Valley RWRP;
- Equipment Optimization at Perris Valley RWRP;
- Install up to five one megawatt Solar Photovoltaic Projects; and
- Improving the Moreno Valley Fuel Cell Capacity

These actions are already underway and will result in both a financial and energy savings for EMWD's ratepayers.

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Chapter 7 Water Supply Reliability Assessment

7.1 Imported Water Supply Reliability

The majority of EMWD's current and projected water supplies are imported through MWD. MWD's resource management strategy depends on improving the reliability and availability of imported water supplies, increasing local storage and developing local resources. In MWD's 2015 UWMP, MWD evaluated challenges to supply reliability, including drought conditions, environmental regulations, water quality concerns, infrastructure vulnerabilities to natural disaster, and responses to variations in water supply availability from year to year.

MWD is facing significant challenges in providing adequate, reliable and high quality supplemental water for Southern California. Dry conditions have impacted water supply reliability on both the SWP and the CRA requiring MWD to make significant withdrawals from its storage reserves. MWD has progressively taken action to address these challenges including; increasing incentives for conservation and recycled water conversion, augmenting supplies through transfers and exchanges, and modifying its distribution system to increase CRA delivery capabilities. In 2015, MWD also implemented Level 3 (15 percent regional reduction) of its Water Supply Allocation Plan (WSAP) allocating water to its member agencies to preserve limited storage. MWD's forecast shows that under multiple-dry year hydrology, MWD could face reduced supply capabilities during the next three years. EMWD will respond to any potential shortages by reducing demand through its WSCP.

Moving forward, flexible and adaptive regional planning strategies are required. MWD's continued progress in developing a diverse resource will allow it to meet the region's water supply needs. MWD's 2015 UWMP detailed its planning initiatives and based on these efforts concluded that with the storage and transfer programs developed, MWD has sufficient supply capabilities to meet the expected demands of its member agencies from 2020 through 2040 under normal, historic single-dry and historic multiple-dry year conditions. EMWD is relying on MWD's 2015 UWMP to evaluate the reliability of imported supplies and the amount of imported water which will be available in EMWD's service area during normal, single dry, and multiple dry water year periods.

7.1.1 MWD Reliability Planning

MWD delivers water from two sources, the CRA and the SWP, and it takes a comprehensive and proactive approach to planning for future water supply needs. Through coordination with member agencies, MWD has developed regional targets for imported water, local resources and conservation to accommodate growth and face the challenges to future supply reliability. Through the past decade, MWD has undertaken several planning initiatives including the MWD Integrated Water Resources Plan (MWD IRP), the Water Surplus and Drought Management Plan (WSDMP), and the WSAP. These programs and plans provide a framework for future Southern California supply planning.

Integrated Resources Planning

In the 1990's, several years of drought and regulatory requirements began to affect the reliability of MWD water supplies. In response to this challenge, MWD and its member agencies began an IRP process to assess needed supply reliability and to find a cost-effective way to meet the goals established. The MWD IRP was a collective effort drawing input from several groups including MWD's Board of Directors; an IRP workgroup (comprised of MWD staff, member agencies and sub agency managers, as well as groundwater basin managers); and representatives from the environmental, agricultural, business and civic communities. It was important for the IRP process to be 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 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 MWD IRP Update was adopted in July of 2004.

MWD's 2010 IRP Update sought to stabilize MWD's traditional imported water supplies and establish additional water resources to withstand California's drought cycles. Challenges addressed in the 2010 MWD IRP included: limitations on SWP and CRA supplies due to environmental issues and drought, regulatory restrictions, economics and climate. The 2010 MWD IRP proposed an adaptive management strategy that balances the potential risks to water supplies with the need to avoid unnecessary investment in resources. The 2010 MWD IRP update demonstrated that MWD and its member agencies have moved the region toward the goal of long-term water reliability; major achievements include:

- 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

Throughout 2015, MWD developed its most recent update of its IRP. The 2015 MWD IRP Update approach recognizes that policy discussions will be essential to the development and maintenance of local supplies and conservation. The findings and conclusions of the 2015 MWD IRP Update include:

- Action is needed – Continued investment in conservation and local supplies is essential to avoiding an unacceptable level of shortage allocation frequency in the future.
- Maintain Colorado River supplies – To stabilize deliveries at 900,000 AFY, more than 900,000 AFY of planned actions will be required.
- Stabilize SWP supplies – Collaborate with state and federal agencies to resolve SWP operations and support better science and interagency collaboration to advance the coequal goals of Bay-Delta restoration and statewide supply reliability. Work collaboratively with state and federal agencies to invest in system modernization and support the California WaterFix and EcoRestore efforts.
- Develop and protect local supplies and water conservation – Increase targets for additional local supplies and conservation to embrace and advance regional self-sufficiency ethics.
- Maximize the effectiveness of storage and transfer – Utilize a comprehensive water transfer approach to stabilize and build storage reserves that will increase MWD's ability to meet water demands in dry years.
- Continue with the adaptive management approach – Update the MWD IRP and adaptive management strategies to incorporate improved understanding and changing conditions.

Water Surplus and Drought Management Plan

In order to ensure 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 WSDMP. Adopted in April of 1999, this plan provides policy guidance for management of regional water to achieve the reliability goals of the IRP. The guiding principle of the WSDMP is to "Manage Metropolitan's water resources and management programs to maximize management of wet year supplies and minimize adverse impacts of water shortage to retail customers."

Water Supply Allocation Plan

In February 2008, MWD adopted its WSAP to allocate water based on need during periods of mandatory imported water allocations throughout the region. The WSAP contains a specific formula and methodology to determine member agency supply allocations. MWD works with member agencies to

periodically review the WSAP formula and make adjustments as needed. The most recent revision to the WSAP was completed in December of 2014. The plan takes into consideration:

- a) The impact on retail customers and the economy
- b) Population and growth
- c) Changes and/or loss of local supply
- d) Reclamation and recycling
- e) Conservation
- f) Investment in local resources

In the event allocation is required, the WSAP establishes base period demands and then adjusts them for population growth and changes in local supply; it then calculates the water supply allocation for each member agency based on the calculated needs. Regional shortages are defined in 10 stages and credits are given for conservation and investment in local supplies. It is MWD's intent to prevent member agencies from experiencing retail shortages that are greater than corresponding regional shortages.

In April 2015, MWD's Board approved implementation of the WSAP at a Level 3 Regional Shortage, effective July 1, 2015 through June 20, 2016. The WSAP allows member agencies to choose among various conservation strategies to help ensure that demands stay in balance with limited supplies.

7.1.2 MWD System Storage

Storage is an important element in MWD's dry-year water supply reliability. MWD has developed dry-year storage with a capacity of over 5.5 MAF through its groundwater storage and surface water reservoirs. Over the past several decades MWD has increased storage significantly through projects like Diamond Valley Lake (located within EMWD's service area) in order to ensure that water needs will be met during years of drought or during a catastrophic event such as an earthquake. The MWD WSDMP established long-term goals for in-basin storage and provides guidance for managing supplies in years of surplus and drought. MWD has been utilizing its dry year storage to meet demand when imported supplies are limited by hydrology.

The probability of MWD meeting dry year demands is dependent on the amount of water MWD has in its reserves. Under some conditions, MWD may choose to implement the WSAP proactively to preserve storage reserved for a future year.

7.2 Groundwater and Desalinated Groundwater Supply Reliability

Protecting the available groundwater supply is an integral component of EMWD's planning efforts. EMWD is actively working with other agencies and groups to ensure that groundwater will be a reliable resource far into the future. To improve groundwater reliability EMWD and other groundwater producers are reducing production of native groundwater and using imported water to supplement natural recharge.

EMWD and the other participants in the Hemet/San Jacinto area have agreed to reduce production. In 2015, EMWD's base production right for the Hemet/San Jacinto Basin was 9,300 AF. The long-term base production right for EMWD is 7,303 AFY.

Production over the base production right requires basin replenishment. There is a long-term agreement in place for MWD to provide an average of 7,500 AFY for replenishment in the Hemet/San Jacinto Basin. This water is to be used by the Soboba Tribe with any unused water available to the other municipal producers in the Hemet/San Jacinto Basin, as described in Section 6.3.2. EMWD has plans to expand recharge through the ERRP.

Potable groundwater production from the West San Jacinto Basin will remain stable, while brackish groundwater production will increase as EMWD's desalter program is expanded.

Desalination of groundwater from the West San Jacinto Basin increases groundwater supply reliability in the San Jacinto Basin by helping manage increasing groundwater levels that are due to decreased production. Desalination also prevents migration of brackish groundwater that could otherwise contaminate potable groundwater supplies.

7.3 Recycled Water Supply Reliability

As of 2014, EMWD reached its strategic goal of maximizing beneficial reuse of recycled water by reusing 100 percent of the wastewater generated in its service area as recycled water. Because recycled water supply is dependent on wastewater generation and not precipitation, it is considered a nearly 100 percent reliable, drought-resistant supply. EMWD also has optimization efforts underway to improve operation of the recycled water system, including the distribution storage facilities.

7.4 Water Quality

Promoting and protecting the quality of its water resources is a vital part of EMWD's planning and operations. Water quality constraints for imported water and groundwater are part of the criteria used to evaluate the value of a proposed project. EMWD does not anticipate a reduction in supply reliability due to water quality constraints. Contaminants of concern may require treatment or blending, but long-term supply planning indicates that the quantity of available water will not be diminished from projected levels due to quality.

7.4.1 Imported Water Quality

As part of the MWD IRP and other planning efforts, MWD has concentrated on maintaining the quality of source water and developing management programs that protect and enhance water quality. MWD has two water sources: the CRA and the SWP. MWD responds to water quality concerns by concentrating on protecting the quality of source water and developing water management programs that maintain and enhance water quality. Based on current knowledge, the only water quality threat to MWD water supplies that may require future treatment is the potential for increased salinity levels.

To date, MWD has not identified any other water quality issues that cannot be mitigated. Increased salinity may impact the amount of water available in the future. If additional 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 4 of the 2010 RUWMP.

Colorado River

The most significant threat to the Colorado River supplies is salinity levels. Colorado River supplies are blended with SWP water to meet the MWD's adopted salinity standards. However, due to the recent severe drought, SWP is in limited supply and the Colorado River supply has not been blended. Therefore, salinity has increased. MWD has several programs in place to reduce the current salinity level of MWD supplies and protect salinity levels from rising in the Colorado River. In addition, MWD is also working to protect the Colorado River from threats of uranium, perchlorate and hexavalent chromium. MWD has also been active in efforts to protect CRA supplies from potential increases in nutrient loading, and occurrences of N-Nitrosodimethylamine (NDMA) and other the constituents of emerging concern. MWD fully expects its source protection efforts to be successful, therefore the only water quality concern with the potential to significantly impact the use of Colorado River water is salinity.

Salinity

Water imported via the CRA has the highest level of salinity of all of MWD's sources of supply, with TDS averaging around 630 milligrams per liter (mg/L) since 1976. Concerns about salinity led the seven Colorado River basin states to form the Colorado River Basin Salinity Control Forum (Forum) to

cooperatively address the issue. The Forum proposed and the U. S. Environmental Protection Agency (USEPA) approved water quality standards in 1975 that established numeric criteria for salt loading and required that the flow-weighted average annual salinity remain at or below the 1972 levels. The Forum developed and implemented the Colorado River Basin Salinity Control Program. The program is designed to prevent a portion of the salt supply from moving into the river system through the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs. Salinity control projects have reduced salinity concentrations of Colorado River water TDS on average by over 100 mg/L or \$264 million per year (2005 dollars) in avoided damages. During periods of high flow, salinity levels have been known to drop to 525 mg/L, but drought has brought the return of higher salinity levels.

Uranium

Near Moab, Utah, 750 feet from the Colorado River, a 16 million ton pile of uranium mill tailings is a potential source of water contamination. In 1999, the US Department of Energy (DOE) began the remediation of the site, including the removal and offsite disposal of the tailings and onsite groundwater remediation. DOE projects that the cleanup should be completed by 2025. MWD is monitoring cleanup efforts and encourages the on-going funding and rapid cleanup of the site.

In recent years, an increase in mining claims filed near Grand Canyon National Park and the Colorado River has caused concern. MWD has responded with letters to the Secretary of the Interior to bring attention to the importance of source water protection and advocate for close federal oversight over these activities. In 2009, Secretary of Interior Ken Salazar announced a two-year hold on new mining claims on 1 million acres adjacent to the Grand Canyon. In 2012, the U.S. Department of Interior instituted a 20-year moratorium on new mining within the Grand Canyon watershed region, covering approximately two-thirds of the lands included in the Greater Grand Canyon Heritage National Monument proposal.

Perchlorate

In June of 1997, perchlorate was first detected in Colorado River water and attributed to a chemical manufacturing site in Henderson, Nevada. Another large perchlorate plume has also been detected in the Henderson area but is not known to have reached the Las Vegas wash. Remediation began in 1998 and has reduced perchlorate loading entering the Colorado River system by 90 percent. Levels of perchlorate in the Colorado River measured at Lake Havasu have decreased from a high of 9 micrograms per liter ($\mu\text{g/L}$) to 2 $\mu\text{g/L}$ since June of 2006. California's maximum contaminant level (MCL) for perchlorate is 6 $\mu\text{g/L}$ in finished drinking water. In 2015, Office of Environmental Health Hazard Assessment (OEHHA) adopted a new public health goal (PHG) of 1 $\mu\text{g/L}$ for perchlorate.

Chromium VI

On July 27, 2011, The OEHHA established a final PHG of 0.02 $\mu\text{g/L}$ for Chromium VI in drinking water. A PHG is the level of a contaminant in drinking water for which there is no known or expected risk to health. OEHHA based these goals on the best available toxicological data in the scientific literature. On July 1, 2014, a California MCL of 10 $\mu\text{g/L}$ for hexavalent chromium became effective. Currently there is no federal MCL for hexavalent chromium, only for total chromium. Chromium VI has been detected in a groundwater aquifer on the site of Pacific Gas and Electric (PG&E) near the vicinity of the Colorado River at Topock, Arizona. Currently PG&E is operating an interim groundwater extraction and treatment system that is protecting the Colorado River. MWD participates in various stakeholder workgroups and forums that are involved in the corrective action report. Results from Chromium VI monitoring of the Colorado River from sites upstream and downstream of the Topock site have ranged from not detected ($<0.03 \mu\text{g/L}$) to 0.06 $\mu\text{g/L}$.

Nutrients

High levels of nutrients (phosphorous and nitrogen compounds) can stimulate algae and aquatic weed growth that affect consumer acceptability and produce taste and odor concerns. Nutrients and the resulting algae and aquatic weed growth can also impede conveyance, increase operational costs and

provide a food source for invasive mussel species. The Colorado River naturally has low concentrations of phosphorous but population increases in the future could increase loadings. Additional phosphorous loadings could impact MWD's ability to blend Colorado River water with SWP water, which has higher concentrations of nutrients. To prevent an increase in nutrient loading in CRA water, higher levels of wastewater treatment are required at existing reclamation facilities along the Colorado River. MWD is engaged with these agencies to encourage enhanced wastewater management.

N-Nitrosodimethylamine

NDMA is a byproduct of disinfection of some natural water with chloramines. MWD uses chloramines as secondary disinfection at all of its treatment plants. MWD is in the process of understanding the watershed sources and developing treatment strategies to minimize NDMA formation. OEHA set a PHG for NDMA of 0.003 µg/L. MWD has monitored source waters and treated water on a quarterly basis since 1999 with results ranging from not detected to 0.014 µg/L. Due to the frequency at which NDMA was detected in the national UCMR2 sample set, it is likely that NDMA will be regulated by the USEPA in the future.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are an emerging concern for the water industry. In 2007, MWD began a monitoring program to determine the occurrence of PPCPs in drinking water treatment plants and source water locations. PPCPs have been detected in source waters at very low part per trillion levels, consistent with the results from other water agencies. More work is required to improve testing and analytical methods, characterize PPCPs in drinking water sources and then determine the effects PPCPs may have on recycled water use and groundwater recharge.

State Water Project

Water quality issues in SWP include total organic carbon (TOC), bromides, arsenic, nutrients, NDMA, PPCPs, and salinity. TOCs and bromides present the greatest water quality concern for the SWP because they cause operational constraints and require additional treatment at MWD facilities. Due to the recent severe drought, SWP supply has been limited.

Total Organic Carbon and Bromides

TOC and bromide concentrations in SWP supplies present a significant challenge for MWD to maintain safe drinking water quality. High levels of TOC and bromide form disinfection byproducts (DBPs) during the water treatment processes. Agricultural drainage and seawater intrusion also increase the levels of TOCs and bromide. The BDCP has outlined several options for improving water quality in the Bay-Delta. In addition to addressing the protection of source water, MWD uses CRA water to blend with SWP to reduce TOC and bromide concentrations in two of their existing plants. MWD has upgraded both the Skinner and Mills Water Treatment Plants by installing ozone treatment. Ozone readily oxidizes organic compounds to reduce the formation of disinfection byproducts, taste, and odor compounds. However, ozone can cause bromate formation when bromide is present in water from the SWP.

Arsenic

Historically, arsenic in MWD supplies has been detected at very low levels that do not require treatment or blending. However, some of the groundwater basins used by MWD for storage programs have higher levels of arsenic that are at or near the threshold requiring additional treatment. MWD has had to restrict flow from one program to meet arsenic limits in the SWP. One groundwater banking partner has installed a pilot treatment program increasing the cost of the groundwater banking program. MWD has also invested in solids handling facilities and implemented operational changes to manage arsenic in solids resulting from treatment.

Nutrients

The SWP has significantly higher nutrient levels than the CRA. Agricultural discharges, wastewater discharges and nutrient rich Bay-Delta soils contribute to higher concentrations of nutrients in the Bay-

Delta. Algae growing in nutrient rich water also can release taste and odor compounds into the water. MWD reservoirs containing SWP water have been bypassed at times to avoid taste and odor complaints, causing short-term supply reliability concerns. To address nutrient levels, MWD is working with other agencies receiving Bay-Delta water to reduce nutrient loading in the Bay-Delta. MWD also uses a comprehensive algae monitoring program to provide early warning of problems and to better monitor water quality in the system. Implementation of ozonation at the Mills and Skinner Water Treatment Plants has also helped with taste and odor problems associated with algae blooms. The water produced by EMWD's Hemet and Perris Water Treatment Plants, which may be sourced from the SWP, does not have the benefit of ozonation. When there is an algae bloom in the source water system, EMWD is unable to remove the taste and odor causing compounds.

N-Nitrosodimethylamine

As described under CRA supplies, NDMA is an emerging concern and MWD is active in efforts to monitor and address NDMA.

Pharmaceuticals and Personal Care Products

As described under CRA supplies, PPCPs are an emerging concern and MWD is active in efforts to monitor and address PPCPs.

7.4.2 Groundwater and Desalinated Groundwater Quality

EMWD has an extensive and proactive groundwater monitoring program that includes collecting, compiling and analyzing data related to groundwater quality. There are no known significant threats to EMWD's groundwater supply that cannot be mitigated by treatment or blending and EMWD does not anticipate a significant loss of supply due to water quality issues. EMWD may occasionally alter operational patterns to support treatment or blending.

EMWD protects groundwater supplies from potential water quality risks including contamination from salinity, nitrates, and chlorinated and other volatile organic compounds. Other contaminants have also been found in local groundwater sources at levels exceeding PHGs and may require additional treatment in the future.

Salinity and Nitrates

In partnership with other agencies, EMWD is responsible for the protection and preservation of local groundwater under the authority of the HSJ Management Plan and the WSJ Management Plan. Salinity and nitrate levels in groundwater increase due to agricultural activities, urban use, and recycled water use. EMWD monitors the salinity and nitrate levels in local basins as part of the groundwater management plan. EMWD also evaluates the ambient water quality for the basins and the data indicates that the basins are slowly increasing in concentrations of salinity and nutrients. Typically, the groundwater water quality meets the safe drinking water standards for salinity and nutrients and can be used directly. Where the salt and nutrients exceed the drinking water standards, EMWD addresses water quality through the efforts of the desalination program. Two operational desalination plants and one planned plant are part of EMWD's effort to remove salts and nutrients from the brackish water supply. In addition to supplying a source of drinking water, desalination also prevents the migration of brackish groundwater into other management zones.

Chlorinated Solvents and Other Volatile Organic Compounds

In the WSJ Management Plan, chlorinated solvents and other volatile organic compounds have been found in amounts that exceed PHGs. Chlorinated solvents are volatile organic compounds (VOCs) that contain chlorine. In general, they are used in aerospace and electronics industries, dry-cleaning, and degreasing industries. EMWD is vigilant in protecting groundwater basins from VOC contamination by closely monitoring the construction of new businesses such as gas stations and manufacturing within the vicinity of production wells. Through the review of proposed new development, EMWD works with local land agencies to ensure that groundwater quality is protected.

Arsenic

Arsenic is a naturally occurring compound found in rocks, soil, water and air. Arsenic has been found in several of EMWD's wells at levels that range from not detected to 12 µg/L (2015 data). In 2006, the MCL for arsenic in domestic water supplies was lowered to 10 µg/L by the USEPA. Currently, high arsenic concentration sources are blended with lower concentration sources to comply with the MCL. Should California lower the State's MCL below the federal level, some of EMWD's production wells could be impacted, requiring additional treatment facilities to utilize these wells.

Pharmaceuticals and Personal Care Products

PPCPs are constituents of emerging concern and EMWD has been and will continue to be proactive in addressing water quality concerns that arise. EMWD participates in the USEPA's Unregulated Contaminant Monitoring Rule program, which recently has included monitoring for PPCPs.

7.4.3 Recycled Water Quality

EMWD has an extensive recycled water program and this supply is used for landscape, agricultural, environmental, and industrial (cooling tower) uses. It significantly offsets non-potable water demands throughout the EMWD. Water quality issues with recycled water include high salinity, nutrients, and PPCPs.

Salinity and Nutrient Management

One of the challenges with the use of the recycled water is that it has salinity and nutrient concentrations that exceed the Santa Ana Region's basin plan objectives. EMWD has a Salinity and Nutrient Management Program (SNMP) specifically designed to evaluate and address the salinity and nutrient impacts that may be associated with the use of recycled water. The SNMP determines whether or not the recycled water complies with the basin plan water quality objectives. In the basins where the recycled water does not meet the water quality objectives, the SNMP determines the excess loading to the basin and describes EMWD's offset mitigation measure to address the added salt and nutrient load. Because recycled water offers a great benefit to the region and reduces the demand on the potable water system for non-potable water purposes, the basin plan allows the excess salt and nutrient load to be mitigated. The SNMP describes the approved offset mitigation measures utilized by EMWD. This offset program ensures that for every excess pound of salt or nutrient added to the basin, a corresponding pound is removed by desalinization wells or mitigated by replenishment with higher quality water.

Pharmaceuticals and Personal Care Products

PPCPs are a source of concern in EMWD's recycled water. In 2008, EMWD participated with SAWPA to form a Task Force to develop a plan to characterize emerging constituents (ECs) throughout the region. In 2009, the Task Force presented an acceptable monitoring plan to the Santa Ana Regional Water Quality Control Board to monitor specific ECs. The plan included monitoring by SAWPA members to evaluate EC levels in wastewater effluent, local receiving streams and other raw water supplies imported into the area. Samples were collected in the spring of 2010 and a final report was prepared by SAWPA in late 2010. The results indicated the presence of some ECs at trace levels (parts per trillion) in the wastewater effluent that are consistent with the results from other wastewater agencies. EMWD tests for ECs in recycled water every three years, and monitors efforts towards the development of regulations.

7.4.4 Summary of Potential Water Quality Impacts to Supplies

There are no known water quality concerns that will significantly impact water supply reliability. Water supplies will be managed to protect water quality to the greatest extent possible, and treatment will be implemented if necessary. Table 7-1 summarizes projected reductions in water supplies due to water quality issues.

Table 7-1: Estimated Reduction in Water Supplies Due to Water Quality

Water Source	Description of Condition	2015	2020	2025	2030	2035	2040
Imported Water	MWD has not identified any water quality issues that cannot be mitigated	0	0	0	0	0	0
Groundwater	EMWD has not identified any water quality issues that cannot be mitigated	0	0	0	0	0	0
Recycled Water	EMWD has not identified any water quality issues that cannot be mitigated	0	0	0	0	0	0

7.5 Reliability by Year Type

Since the majority of EMWD's retail and wholesale supplies are imported from MWD, EMWD's normal, single-dry and multi-dry year conditions are based on the same years used by MWD in its 2015 UWMP. As described in MWD's 2015 UWMP, these years are based on hydrological conditions impacting SWP supplies. EMWD's single-dry year condition is represented by 1977 hydrology and the multiple-dry year condition is represented by 1990-1992 hydrology. EMWD's average year is represented by the average of the 1922-2004 hydrologic conditions. Table 7-2 and Table 7-3 summarize the basis of water data for EMWD's retail and wholesale supplies, respectively.

Table 7-2: Retail Basis of Water Year Data

DWR Table 7-1 Retail: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply ¹
Average Year	1922-2004	--	100%
Single-Dry Year	1977	--	100%
Multiple-Dry Years 1st Year	1990	--	100%
Multiple-Dry Years 2nd Year	1991	--	100%
Multiple-Dry Years 3rd Year	1992	--	100%

1) The MWD IRP simulations show no risk of shortages (allocation) for MWD supply, for the average, single-dry year (1977) and multiple-dry year (1990–1992) conditions.

Table 7-3: Wholesale Basis of Water Year Data

DWR Table 7-1 Wholesale: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply¹
Average Year	1922-2004	--	100%
Single-Dry Year	1977	--	100%
Multiple-Dry Years 1st Year	1990	--	100%
Multiple-Dry Years 2nd Year	1991	--	100%
Multiple-Dry Years 3rd Year	1992	--	100%

1) The MWD IRP simulations show no risk of shortages (allocation) for MWD supply, for the average, single-dry year (1977) and multiple-dry year (1990–1992) conditions.

7.6 Supply and Demand Assessment

Based on the information provided in the MWD 2015 UWMP, EMWD has the ability to meet current and projected water demands through 2040 during normal, historic single-dry and historic multiple-dry year periods using imported water from MWD with existing supply resources. Planned local supplies will supplement imported supplies and improve reliability for EMWD and the region.

7.6.1 Average Year

The average water year selected by EMWD uses the historic average hydrology of years 1922-2004. Table 7-4 and Table 7-5 demonstrate that EMWD will have sufficient supplies to meet both retail and wholesale demands from 2020 to 2040 under average year conditions.

Table 7-4: Retail Normal Year Supply and Demand Comparison (AFY)

DWR Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	145,745	159,834	172,917	185,800	197,800
Demand totals	145,745	159,834	172,917	185,800	197,800
Difference	0	0	0	0	0

Table 7-5: Wholesale Normal Year Supply and Demand Comparison (AFY)

DWR Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	52,156	58,866	62,883	66,800	70,400
Demand totals	52,156	58,866	62,883	66,800	70,400
Difference	0	0	0	0	0

7.6.2 Single-Dry Year

The single-dry year represents the year with the lowest water supply available to the agency. EMWD's single-dry year is represented using 1977 hydrologic conditions. EMWD's Water Supply Strategic Plan (2016) conducted a study to analyze potential changes in demand due to dry, hot conditions. The study estimated up to a 14 percent increase in retail water demand could occur under these conditions. EMWD

has developed programs to help accommodate increases in demand during dry years including the planned ERRP project (described in Sections 6.8 and 6.9) which would allow EMWD to rely more heavily on groundwater supplies to meet demand in dry years. Additionally, EMWD would could import more water from MWD to meet increases in demand. Table 7-6 and Table 7-7 demonstrate that EMWD will have sufficient supplies to meet both retail and wholesale demands from 2020 to 2040 under single-dry year conditions, despite an increase in demands.

Table 7-6: Retail Single-Dry Year Supply and Demand Comparison (AFY)

DWR Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	166,300	182,400	197,400	212,000	225,700
Demand totals	166,300	182,400	197,400	212,000	225,700
Difference	0	0	0	0	0

Table 7-7: Wholesale Single-Dry Year Supply and Demand Comparison (AFY)

DWR Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	58,500	66,200	70,700	75,200	79,300
Demand totals	58,500	66,200	70,700	75,200	79,300
Difference	0	0	0	0	0

7.6.3 Multiple-Dry Year

The multiple-dry year period represents the lowest average water supply availability to the agency for a consecutive three-year period. EMWD's multiple-dry year period is represented using hydrologic conditions similar to the 1990-1992 period. EMWD analyzed demands during the 1990-1992 hydrologic period and found an overall increase in demands of 14 percent of average in the first year of the multiple-dry year period. Demands during these conditions decreased to 88 percent of average during the second year, likely as the result of conservation messaging, followed by 92 percent of average in the third year. EMWD applied these demand fluctuations to its demand projections for a multiple-dry year period in Table 7-8 and Table 7-9 below. As demonstrated in the tables, EMWD will have sufficient supplies to meet both retail and wholesale demands from 2020 to 2040 under multiple-dry year conditions. During periods of increase demands, EMWD would be able to utilize stored groundwater from the proposed ERRP project (described in Sections 6.8 and 6.9) or import more water from MWD to meet demands, if needed.

Table 7-8: Retail Multiple-Dry Years Supply and Demand Comparison (AFY)

DWR Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	166,300	182,400	197,400	212,000	225,700
	Demand totals	166,300	182,400	197,400	212,000	225,700
	Difference	0	0	0	0	0
Second year	Supply totals	142,500	155,400	167,400	179,000	190,100
	Demand totals	142,500	155,400	167,400	179,000	190,100
	Difference	0	0	0	0	0
Third year	Supply totals	149,500	162,700	175,100	186,900	198,600
	Demand totals	149,500	162,700	175,100	186,900	198,600
	Difference	0	0	0	0	0

Table 7-9: Wholesale Multiple-Dry Years Supply and Demand Comparison (AFY)

DWR Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	58,500	66,200	70,700	75,200	79,300
	Demand totals	58,500	66,200	70,700	75,200	79,300
	Difference	0	0	0	0	0
Second year	Supply totals	48,500	54,700	58,200	61,700	64,900
	Demand totals	48,500	54,700	58,200	61,700	64,900
	Difference	0	0	0	0	0
Third year	Supply totals	52,000	57,400	61,100	64,600	68,000
	Demand totals	52,000	57,400	61,100	64,600	68,000
	Difference	0	0	0	0	0

7.7 Regional Supply Reliability

EMWD anticipates it will have enough supplies to meet demands under all water year conditions from 2020 through 2040. To supplement MWD imported sources and improve reliability, EMWD has several local resource programs. Production of local groundwater has been a source of supply for EMWD's service area for decades, but overproduction of groundwater has led to a need for groundwater management. Native production is limited and plans are in place to recharge local ground water basins to increase supply reliability. Desalination of high TDS groundwater also provides a reliable local supply of water.

Recycled water production and sales reduce the demand for imported water and provide a sustainable supply. EMWD's continued investment in improved facilities will continue to grow the market for recycled water, and innovative planning and recycled water management will allow EMWD's recycled water supply to bring an even greater benefit to the service area.

EMWD also has several planned projects that will increase regional supply reliability by increasing local supplies and decreasing demands for imported water from MWD. These projects include increasing local groundwater banking through the ERRP, expanding the desalter program with the Perris II Desalter, and full utilization of recycled water through implementation of IPR. These planned projects are described in detail in Section 6.9.

In addition to the development of local resources, EMWD aggressively promotes the efficient use of water. Through the implementation of local ordinances, conservation programs and an innovative tiered pricing structure, EMWD is reducing demands on retail accounts. Reducing demands allows existing and proposed water supplies to stretch farther and reduces the potential for water supply shortages.

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Chapter 8 Water Shortage Contingency Planning

Recognizing the need to preserve and protect public health and safety, EMWD's WSCP applies regulations and restrictions on the delivery and consumption of potable outdoor and indoor water use during water shortages. EMWD's WSCP, originally adopted by ordinance, is now Article 10 to Title 5 of EMWD's Administrative Code. Modification is made to the WSCP from time to time. The most recent modification, adopted January 20, 2016, included additional restriction on water use in Stage 4c of the WSCP. The WSCP is attached as Appendix I.

The WSCP is based on the following priorities:

- Public safety, health and welfare
- Sustaining economic vitality
- Quality of life

Restrictions are structured to protect the safety, health and welfare of the public and minimize the impact a water shortage may have on the local economy and quality of life. This is done mainly through the use of EMWD's allocation-based tiered rate structure, focusing on those customers with wasteful behaviors first and then targeting other customers as a shortage becomes more severe.

Over ninety percent of EMWD's customers are either single-family residential, multi-family residential or landscape customers. These customers are subject to allocation-based tiered rates. There are four tiers in EMWD's rate structure; the first two tiers apply to indoor and outdoor use respectively, the third tier is applied to water use up to 50 percent above the Tier 1 and 2 budgets, and Tier 4 is applied to any water use in excess of Tier 3. In times of water shortage the thresholds for Tiers 2 and 3 are reduced as shortage levels increase. Under the most extreme shortage conditions, no outdoor water use is allowed and indoor water use may be restricted up to 50 percent.

CII and agricultural customers must also reduce demand during periods of shortage. These customers face event-driven penalties and could face fines if found violating water use restrictions. Wholesale customers are allocated water using the formula and methodology in MWD's WSAP.

8.1 Stages of Action

The WSCP limits water demand during times of shortage in five stages. These stages can be triggered when there is water deficiency caused by limitations on supply or by 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.

EMWD will implement an appropriate stage based on current water conditions such as:

- EMWD water supply conditions and storage levels
- Statewide water supply conditions
- Local water supply and demand conditions
- MWD WSAP implementation or other actions requiring a reduction in water demand
- Actions of surrounding agencies

Higher stages will be implemented as shortages continue and/or if customer response does not bring about desired water savings.

When implementation of the WSCP is triggered by anticipated limitations in supply or delivery, EMWD's General Manager shall request the Board of Directors to authorize and implement the provisions of the WSCP. The request shall be made at a regular or special meeting of the Board of Directors, to implement provisions of the WSCP. The Board of Directors has the authority to initiate or terminate the water shortage contingency measures described in the WSCP. When a water shortage

emergency occurs, the WSCP authorizes the General Manager to declare the extent of a potable water shortage emergency and to implement the appropriate water shortage contingency measures.

8.1.1 Retail Stages of Action

The WSCP stages for EMWD's retail customers are summarized in the table below. The first two stages of the WSCP are voluntary, while the successive stages are mandatory and include sub-stages to reflect changes to the tiered rate structure. These stages are discussed further in Section 8.2.

Table 8-1: Retail Stages of WSCP

DWR Table 8-1 Retail: Stages of Water Shortage Contingency Plan		
Stage	Percent Supply Reduction	Water Supply Condition¹
1	up to 10%	Supply watch. Customers will be asked to reduce up to 10% of demand voluntarily.
2	up to 25%	Supply alert. Customers will be asked to reduce 25% of demand voluntarily.
3	up to 25%	Mandatory Waste Reduction. At this stage efforts will be focused on a mandatory reduction of excessive water use.
4	up to 50%	Mandatory Outdoor Reduction. At this stage efforts will be focused on mandatory reduction of outdoor water use.
5	50% or greater	Mandatory Indoor Reduction. At this stage efforts will be focused on mandatory reduction of indoor water use. This stage would only be implemented in response to a catastrophic loss of supplies requiring a 50 percent or more reduction in demand.

1) EMWD has built flexibility into its WSCP. Stages are not directly tied to water supply conditions. The WSCP can be implemented as needed to meet a reduction in demand or to respond to other conditions. In 2015 and 2016, EMWD implemented Stage 4 of its WSCP to meet the requirements of the SWRCB Emergency Regulation. The required reduction did not reflect EMWD's supply reliability..

8.1.2 Wholesale Stages of Action

During mandatory water shortage stages, wholesale customers will be required to reduce their retail water demands such that they are equivalent to EMWD's retail water demand reductions. If MWD imposes limited supply allocations on EMWD and other member agencies, supply to EMWD's wholesale customers will be allocated using the formula and methodology based on MWD's WSAP. EMWD will establish base period demands and then adjust them for growth and changes in local supply. Regional shortages will be phased in 10 stages. At each stage, wholesale customers will not experience shortages on the wholesale level that are greater than one-and-a-half times the percentage shortage of regional water supplies. The wholesale customers will also not face a retail shortage less than the regional shortage. Credits will be given for conservation and investment in local supplies. Penalty rates apply for use over allocations.

Table 8-2: Wholesale Stages of Water Shortage Contingency Plan

DWR Table 8-1 Wholesale: Stages of Water Shortage Contingency Plan		
Stage	Percent Supply Reduction¹	Water Supply Condition
1	5%	MWD regional shortage level 1
2	10%	MWD regional shortage level 2
3	15%	MWD regional shortage level 3
4	20%	MWD regional shortage level 4
5	25%	MWD regional shortage level 5
6	30%	MWD regional shortage level 6
7	35%	MWD regional shortage level 7
8	40%	MWD regional shortage level 8
9	45%	MWD regional shortage level 9
10	50%	MWD regional shortage level 10

1) Percentages represent MWD's regional shortage level and not retail shortages. EMWD will pass through MWD's WSAP to its wholesale customers.

8.2 Prohibitions on End Uses

The WSCP prohibitions and reduction methods are organized by customer groups with different limitations on each group. Stages 1 and 2 start with voluntary measures. As the water deficiency increases, measures become mandatory and are intended to lead to the needed reduction in water demand.

8.2.1 Reduction Requirements

The WSCP targets a reduction in demand in specific tiers for single-family residential, multi-family residential and landscape customers. Table 8-3 summarizes the required reduction in each tier by stage.

Table 8-3: Tiered-Rate Water Reduction Requirements

Stage	Tier 1 Indoor Use	Tier 2 Outdoor Use	Tier 3 Excessive Use	Tier 4 Wasteful Use
1	Voluntary Reduction up to 10%			
2	Voluntary Reduction up to 25%			
3a	No variances or adjustments will be allowed for filling swimming pools, establishing new landscapes or leaks that are not repaired within 48 hours.			
3b			50% reduction	
3c			100% reduction	
4a		10% reduction	100% reduction	
4b		up to 50% reduction	100% reduction	
4c		up to 100% reduction	100% reduction	
5a	10% reduction	100% reduction	100% reduction	
5b	30% reduction	100% reduction	100% reduction	
5c	50% reduction	100% reduction	100% reduction	

Due to the most recent drought, EMWD is currently implementing Stage 4b of its WSCP with a mandatory 30 percent water budget reduction for Tier 2 outdoor use. This action was taken to meet

SWRCB mandatory demand reduction requirements and does not reflect a shortage in EMWD's water supply.

CII, Agricultural customers and any other customer without a water budget will be assigned a water budget based on historical water use. Allocations will be decreased according to the percentages listed for Stages 5a-5c, and the current Tier 4 rate will be applied to any use above the decreased allocation value.

8.2.2 Prohibitions

In order to reduce EMWD's retail demand in the case of deficiency in water supply, EMWD developed water use efficiency requirements that are to be followed at all times. Additional prohibitions on end uses are implemented at higher stages of water shortage in addition to the on-going water use efficiency requirements. As part of EMWD's WSCP, voluntary and mandatory water use reductions are expected through the on-going enforcement of the water use efficiency requirements, EMWD's water allocation-based tiered rates, and penalties for run off. Table 8-4 summarizes the water use efficiency requirements and additional prohibitions for each stage of EMWD's WSCP. Under the most extreme deficiencies, these prohibitions would reduce demand by more than 50 percent.

Table 8-4: Restrictions and Prohibitions on End Uses

DWR Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other - Prohibit use of potable water for washing hard surfaces	Except for health or sanitary reasons	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Repair leaks within 48 hours of occurrence	Yes
1	Landscape - Limit landscape irrigation to specific times	Only between 9:00 p.m. and 6:00 a.m. except when: -manually watering -establishing new landscape -temperatures are predicted to fall below freezing -it's for very short periods of time to adjust or repair an irrigation system	Yes
1	Landscape - Prohibit certain types of landscape irrigation	Unattended irrigation systems using potable water are prohibited unless they are limited to no more than fifteen (15) minutes watering per day, per station. This limitation can be extended for: -Very low flow drip irrigation systems when no emitter produces more than two (2) gallons of water per hour -Weather based controllers or stream rotor sprinklers that meet a 70% efficiency	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Avoid over watering or watering of hardscape and the resulting runoff	Yes
1	Other water feature or swimming pool restriction	Decorative fountains must be equipped with a recycling system	Yes
1	Other	Allowing water to run while washing vehicles is prohibited	Yes

Table 8-4: Restrictions and Prohibitions on End Uses (Continued)

DWR Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses (Continued)			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other	Install new landscaping with low-water demand trees and plants. New turf shall only be installed for functional purposes	Yes
1	Landscape - Other landscape restriction or prohibition	Watering during rain, or within 48 hours after measurable rain, is prohibited	Yes
2	Landscape - Other landscape restriction or prohibition	Reduce watering or irrigating of lawn, landscape or other vegetated areas with sprinklers by one day a week	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system repaired within 72 hours	Yes
2	Other water feature or swimming pool restriction	Refrain from filling or re-filling of ornamental lakes or ponds	Yes
2	Other	Refrain from using potable water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not	Yes
3a	Other	No variances or adjustments will be allowed for filling swimming pools, establishing new landscapes or leaks that are not repaired within 48 hours	Yes
3b	Other	Tier 3 (Excessive Use) water budget decreased by 50%	Yes
3c	Other	Tier 3 (Excessive Use) water budget decreased by 100%	Yes
4	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawn, landscape, or other vegetated areas with sprinklers should be limited to the following schedule: -June – August: A maximum of two days a week -September – May: A maximum of one day a week	Yes
4a	Other	Tier 2 (Outdoor Use) water budget decreased by 10%	Yes
4b	Other	Tier 2 (Outdoor Use) water budget decreased by up to 50%	Yes
4c	Other	Tier 2 (Outdoor Use) water budget decreased by up to 100%	Yes
5a	Other	Tier 1 (Indoor Use) water budget decreased by 10%	Yes
5b	Other	Tier 1 (Indoor Use) water budget decreased by 30%	Yes
5c	Other	Tier 1 (Indoor Use) water budget decreased by 50%	Yes
5	Other	CII, Agricultural, and any other customer without a water budget will be given a water budget based on historical water use, and allocations will be reduced according to the percentages listed for stages 5a-5c (up to 50 percent)	Yes

8.3 Determining Water Shortage Reductions

EMWD measures and determines the actual water savings made by implementing each stage of the WSCP by relying on water meters that record the production and consumption of water. Each level of the WSCP has an associated metered reduction.

8.4 Penalties, Charges, Other Enforcement of Prohibitions

For Stages 1 and 2 of the WSCP, demand reduction is voluntary; but it will be encouraged through the on-going enforcement of EMWD's water budget based tiered rates and penalties for runoff. Stage 3 of the WSCP is focused on a mandatory reduction of excessive water use through following the conserving actions detailed in Stages 1 and 2. Beginning with Stage 3 event-driven penalties can be imposed for violating any of the restrictions in the WSCP.

Demand reductions will be enforced through changes to EMWD's water budget based tiered rate structure and observation-based penalties. Violations of the water runoff requirement are cumulative over a 12-month period. Table 8-5 lists penalties for event driven restrictions.

Table 8-5: Event Driven Penalties and Charges

Stage	Customer Category	First Violation	Second Violation	Third Violation	Fourth and Subsequent Violations
3	Single-Family	Written Notice	\$25 Fine	\$50 Fine	\$100 Fine
	Multi-Family, CII, Agricultural, and Landscape	Written Notice	\$100 Fine	\$200 Fine	\$300 Fine
4-5	Single-Family	Written Notice	\$50 Fine	\$100 Fine	\$200 Fine
	Multi-Family, CII, Agricultural, and Landscape	Written Notice	\$200 Fine	\$400 Fine	\$600 Fine

Any funds collected from penalties will be dedicated to funding EMWD's conservation programs.

8.5 Consumption Reduction Methods

EMWD utilizes consumption reduction methods to reduce demands for potable water within its service area. EMWD's methods include supplementing its water conservation program during WSCP implementation and implementing its allocation-based tiered rate billing structure by progressively reducing allocations for tiers as higher stages of the WSCP are implemented. Consumption reduction methods that can be used in EMWD's service area to comply with the WSCP are summarized in Table 8-6.

Table 8-6: Consumption Reduction Methods

DWR Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan – Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference
1-5	Expand Public Information Campaign	EMWD will continue to implement its conservation program and may supplement programs during WSCP implementation.
3	Other ¹	Stage 3 progressively reduces the tier 3 allocation. Any water used over the allocations for tiers 1-3 is charged at the tier 4 rate ² .
4	Other ¹	Stage four eliminates the tier 3 allocation and progressively reduces the tier 2 allocation. Any water used over the allocations for tiers 1-2 is charged at the tier 4 rate ² .
5	Other ¹	Stage 5 eliminates the tier 3 and 4 allocations and progressively reduces the tier 1 allocation. Any water used over the allocations for tiers 1 is charged at the tier 4 rate ² .

1) EMWD has four tiers in its allocation-based tiered rate structure

2) The current tier 4 rate is \$11.16 per hundred cubic feet

8.6 Resolution or Ordinance

EMWD's WSCP was added as Article 10 to Title 5 of EMWD's Administrative code by Resolution No. 2014-033 on March 26, 2014. The WSCP was amended on July 2, 2014 by Resolution No. 2014-098, on March 18, 2015 by Resolution No. 2015-011, on August 19, 2015 by Resolution No. 2015-103, and on January 20, 2016 by Resolution No. 2016-016. The amended WSCP is included as Appendix I of this UWMP.

8.7 Catastrophic Supply Interruption

EMWD is dependent on MWD for the majority of its supply. MWD has prepared for emergencies using a combination of storage, facility design and redundant power sources. Emergency storage requirements are based on the potential for a major earthquake that renders major water transportation facilities out of service for six months. Assuming 100 percent of its supplies are unavailable for six months, MWD has enough water storage to sustain 75 percent of normal year firm deliveries. In the event of a major power outage, water supply can be delivered by gravitational feed from recreational reservoirs, including Diamond Valley Lake Reservoir. For treatment plants, MWD has backup power generators in place in case of electrical outages. Additional information about addressing catastrophic supply interruption can be found in Section 2.5 of MWD's 2015 UWMP.

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 many types of emergencies. It specifies chain of command and provides the authority to respond. Elements of that response can include interdepartmental staff notification and mobilization; activation of alternative water supply sources (i.e., interagency connections), use of temporary pumping facilities; use of power generators; public notification; and activation of conservation measures. An emergency is defined as any time period when 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 WSEOP 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 agencies such as the Department of Health Services and MWD. In the event that one or more water supply sources are 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 outages occur, some of EMWD's booster facilities have backup generators. Facilities without redundant power sources may be served on a priority basis by portable generators.

8.8 Revenue and Expenditure Impacts

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 (Rate Stabilization Reserve) has been established to meet the fixed costs associated with water delivery that may not be met in the case of reduced water sales. Table 8-7 and Table 8-8 summarize the anticipated WSCP implementation impacts on revenue and expenditures, respectively. Table 8-9 describes the proposed measures to overcome these potential impacts.

Table 8-7: 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. This reduction would be offset in part by a reduction in water purchased from MWD.

Table 8-8: Actions and Conditions that Impact Expenditures

Category	Anticipated Cost
Increased Staff Cost	Staff costs for implementing the WSCP could vary depending on the stage triggered by a deficiency in water supply. Stages 1 and 2 would probably be implemented with only current staff members. Stages 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 8-9: 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 impose a penalty 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 available to offset increased costs and decreased sales.

8.9 Estimate of Minimum Supply

The UWMP Act requires a retailer to quantify the minimum water supply available during the next three years (2016 to 2018), assuming a repeat of the driest three-year historic sequence. As detailed in *Chapter 7 – Water Supply Reliability Assessment*, this corresponds to the period of 1990, 1991 and 1992 for EMWD’s supplies.

Under a typical dry year scenario, EMWD would increase deliveries from MWD to account for any losses in local supply. After several dry years, MWD could face reduced supply capabilities during the next three years. If a shortage occurs, MWD may implement its water supply allocation plan for member agencies in order to preserve storage reserves. The WSAP charges significantly higher rates for water deliveries over the allocated amount for each member agency.

EMWD and its sub agencies have already reduced demand significantly due to mandatory SWRCB reduction requirements. MWD water deliveries are well below the allocation EMWD received under the current implementation of the MWD WSAP Level 3 regional shortages. If dry conditions continue, EMWD will meet allocation targets through demand reductions as outlined in the EMWD WSCP.

Table 8-10 and Table 8-11 show the minimum supplies available by supply type for EMWD’s retail and wholesale supplies, respectively. Comparing these supplies to the demand projections, EMWD would have adequate supplies available to meet projected demands should a multiple-dry year period occur the next three years. Table 8-12 and Table 8-13 summarize the total minimum supply available for the next three years for EMWD’s retail and wholesale customers.

Table 8-10: Minimum Supply Next Three Years for Retail Service Area (AFY), by Supply Type

	2016	2017	2018
Imported Water	64,900	68,700	72,500
Groundwater	13,600	13,000	12,500
Groundwater Desalters	7,000	7,000	7,000
Recycled Water	43,000	43,000	43,000
Total Supply	128,500	131,700	135,000
Demand	128,500	131,700	135,000
% of Normal	100%	100%	100%

Table 8-11: Minimum Supply Next Three Years for Wholesale Service Area (AFY), by Supply Type

	2016	2017	2018
Imported Water	23,900	24,500	25,200
Recycled Water	2,000	2,000	2,000
Total Supply	25,900	26,500	27,200
Demand	25,900	26,500	27,200
% of Normal	100%	100%	100%

Table 8-12: Minimum Retail Supply Next Three Years (AFY)

DWR Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	128,500	131,700	135,000

Table 8-13: Minimum Wholesale Supply Next Three Years (AFY)

DWR Table 8-4 Wholesale: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	25,900	26,500	27,200

Chapter 9 Demand Management Measures

The CWC and UWMP Act require water agencies to describe the Demand Management Measures (DMMs) that the agency is implementing as part of its overall water conservation program. These align with the best management practices (BMPs) identified by the California Urban Water Conservation Council (CUWCC) in its MOU Regarding Urban Water Conservation in California. As a signatory of the MOU, EMWD pledged to make a good faith effort to implement a prescribed set of urban water conservation BMPs. As both a retail and wholesale water agency, EMWD is responsible for fulfilling the requirements of both the retail and wholesale BMPs.

In December 2008, the Urban MOU was amended and the BMPs were revised. The revision reorganized CUWCC's 14 BMPs into five categories. Two of the categories, Utility Operations and Education, are referred to as "Foundational BMPs" because they are considered to be essential water conservation activities by any utility and are adopted for implementation by all signatories to the CUWCC as ongoing practices with no time limits. The remaining three categories are "Programmatic BMPs" and include Residential; CII; and Landscape. Table 9-1 provides a list of the CUWCC's 14 original BMPs and a mapping of the new BMP Categories.

Programmatic BMPs are designed to achieve quantifiable water savings. Compliance with these BMPs can be demonstrated with two approaches: traditional implementation as prescribed by the components of the BMP category or by the Flex Track Menu Alternatives option, included in each programmatic BMP. Requirements for compliance are determined using base year data from single family residential (SFR) customers, multi-family residential (MFR) units, and CII customers. EMWD has chosen to use the Flex Track approach to demonstrate Programmatic BMP compliance.

Table 9-1: Original CUWCC BMPs and New BMP Categories

Original BMP Description	Applied to		New BMP Category
	Retail	Wholesale	
Residential Water Surveys	Yes	No	Programmatic: Residential
Residential Plumbing Retrofits	Yes	No	Programmatic: Residential
System Water Audits, Leak Detection	Yes	Yes	Foundational: Utility Operations – Water Loss Control
Metering and Commodity Rates	Yes	No	Foundational: Utility Operations – Metering
Large Landscape Audits	Yes	No	Programmatic: Landscape
High Efficiency Washing Machines	Yes	No	Programmatic: Residential
Public Information	Yes	Yes	Foundational: Education – Public Information Programs
School Information	Yes	Yes	Foundational: Education – School Education Programs
Commercial, Industrial, Institutional	Yes	No	Programmatic: Commercial, Industrial, Institutional
Wholesale Agency Assistance	No	Yes	Foundational: Utility Operations – Operations
Conservation pricing	Yes	Yes	Foundational: Utility Operations – Pricing
Conservation Coordinator	Yes	Yes	Foundational: Utility Operations – Operations
Water Waste Prohibition	Yes	No	Foundational: Utility Operations – Operations
Residential ULFT Replacement	Yes	No	Programmatic: Residential

In 2014, the section of the CWC addressing DMMs was significantly modified to simplify, clarify, and update the DMMs reporting requirements in UWMPs. The retail agency requirements were streamlined from 14 specific measures to six general requirements plus an “other” category. The requirements for wholesale agencies were streamlined to three specific measures, an “other” category, and a narrative description of asset management and wholesale supplier assistance programs. Table 9-2 provides a comparison of the CUWCC’s 14 original BMPs with the new 2015 UWMP DMM groupings.

Table 9-2: UWMP Demand Management Measures and CUWCC Best Management Practices

CUWCC BMP Organization and Names (2009 MOU)				
UWMP DMMs	CUWCC BMP Organization and Names (2009 MOU)			
DMM Name	BMP #	BMP Name	Type	Category
(i) Water Waste Prevention Ordinances	1.1.2	Water Waste Prevention	Foundational	Utility Operations Program
(ii) Metering	1.3	Metering with commodity Rates		
(iii) Conservation Pricing	1.4	Retail Conservation Pricing		
(iv) Public Education and Outreach	2.1	Public Information Programs		Education Programs
	2.2	School Education Programs		
(v) Programs to Assess and Manage Distribution System Real Loss	1.2	Water Loss Control		Utility Operations Program
(vi) Water Conservation Program Coordination and Staffing Support	1.1.1	Conservation Coordinator		
(vii) Other Demand Management Measures	3.1	Residential Assistance Program	Programmatic	Residential
	3.2	Landscape Water Survey		
	3.3	High Efficiency Clothes Washers		
	3.4	WaterSense Specification (WSS) Toilets		
	4	Commercial, Industrial, and Institutional		Commercial, Industrial, and Institutional
	5	Landscape		Landscape
Wholesale Supplier Assistance Programs	1.1.3	Wholesale Agency Assistance Programs	Foundational	Utility Operations Program

9.1 CUWCC MOU Compliance

EMWD is both a retail and wholesale agency, and therefore is responsible for complying with all of the 14 CUWCC BMPs. As a signatory to the CUWCC MOU, EMWD continues to support and implement both the retail and wholesale BMPs and is in full compliance with the MOU. Signatories to the MOU that are in full compliance with the CUWCC’s MOU are allowed by CWC Section 10631 to include their 2013-2014 annual CUWCC BMP reports in the 2015 UWMP to meet the requirements of the DMM sections of the UWMP Act. EMWD has chosen to comply with the requirements of the UWMP Act by providing its 2013-2014 BMP annual reports as well as describing the DMMs in the sections below.

EMWD's 2013-2014 retail and wholesale BMP annual reports are included as Appendix J along with documentation from the CUWCC that EMWD has met the MOU coverage requirements.

9.2 Retail Area Demand Management Measures

9.2.1 Water Waste Prevention Ordinances

Water Waste Prevention (BMP 1.1.2)

Coverage requirements: The water agency shall do one or more of the following: (a) enact and enforce an ordinance or establish terms of service that prohibit water waste; (b) enact and enforce an ordinance or establish terms of service for water efficient design in new development; (c) support legislation or regulations that prohibit water waste; (d) enact an ordinance or establish terms of service to facilitate implementation of water shortages response measures; (e) support local ordinances that prohibit water waste; and/or (f) support local ordinances that establish permit requirements for water efficient design in new development.

Compliance method: EMWD has met the coverage requirements in the following ways:

- Ordinance 72.25 – Water Use Efficiency Ordinance, implemented January 1991. EMWD reviews ordinances on a regular basis with the most recent revision effective February 2016. This ordinance prohibits water waste, imposes penalties for runoff, and requires efficient design in new development. The ordinance is enforced in two ways, (1) through EMWD's allocation-based tiered rate structure for single family, multi-family and landscape accounts utilizing the domestic water system; and (2) through penalties for runoff.
- Ordinance 117.2 – Water Shortage Contingency Plan, implemented July 2005. EMWD reviews the WSCP on a regular basis with the most recent modification adopted January 2016. This ordinance is designed for the purpose of 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.
- EMWD supports legislation and local ordinances that prohibit water waste, and supports local ordinances that establish requirements for water efficient design in new development. As a member of the Riverside County Water Task Force, EMWD participated in updating Riverside County's Water Efficient Landscape Requirements Ordinance 859.
- In mid-2015, EMWD adopted new development standards to further promote conservation throughout its service area. Beginning in July 2015, all new developments are prohibited from having non-functional turf, including turf in the front yards of new homes. With more than 60 percent of water in EMWD's service area being used outdoors, this was designed to be a long-term strategy to minimize the impact of new development. EMWD's service area is currently 40 percent built out, making it one of the few regions in Southern California that will see significant population growth in the coming decades. EMWD also helped the County of Riverside adopt a similar ordinance prohibiting turf in the front yards of new homes in all unincorporated areas of Riverside County.
- EMWD has also prohibited the installation of non-functional turf in all new CII developments. While turf is being allowed in functional areas of new development, including parks and schools, it is no longer permitted within common area landscaping that provides no functional community benefit. Non-functional turf can best be described as turf that is only ever walked on when it is being mowed.

9.2.2 Metering

Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections (BMP 1.3)

For consistency with CWC Section 525b, this BMP refers to potable water systems. A water meter is defined as a device that measures the actual volume of water delivered to an account in conformance with the guidelines of the AWWA.

Coverage requirements: (1) Meter all new service connections; (2) Establish a retrofit program for existing unmetered service connections; (3) Read meters and bill customers by volume of use; (4) Prepare a written plan, policy or program for meters that includes census, testing, repair and replacement; (5) Identify barriers to retrofitting mixed use commercial accounts with dedicated landscape meters and conduct feasibility study(s) to assess the merits of providing incentives to switch mixed use accounts to dedicated landscape meters.

Compliance method: EMWD has met the coverage requirements for this measure; (1) meters are required on all new service connections; (2) all service connections in EMWD's service area are metered; (3) meters are read on a monthly basis and billed monthly in hundred cubic feet; (4) EMWD's program for meter testing and replacement is referenced in Table 9-3 below; (5) EMWD has identified and measured all commercial customers with mixed use meters and is in the process of creating water budgets for these customers; (6) in an effort to reduce leaks, a continuous water use notification system was implemented in February 2016 which notifies customers of the presence of a constant water flow running through their meter (for every hour for several days), which is a strong indication of a possible leak; (7) as part of the Water Loss Analysis that takes place every few years, EMWD now sends back approximately 30 small (5/8"-2") meters each month for random testing to ensure accuracy; (8) to better serve its customers in a more accurate and efficient manner, EMWD began installing Advanced Metering Infrastructure (AMI) meters in 2005 and to date has installed 39,000 AMI meters and 45,500 Flex Net Meters, with the goal of complete conversion to Flex Net meters for residential and commercial customers by 2026.

Table 9-3: Meter Testing and Replacement

Meter Type	Meter Size	Monthly Consumption (hundred cubic feet)	Meter Testing Frequency	Meter Replacement Frequency
Residential	5/8" – 2"	Not Applicable	Customer Request	Upon Failure
Commercial	3" and Larger	1001 – Above	6 Months	Upon Failure
Commercial	3" and Larger	401 – 1000	12 Months	Upon Failure
Commercial	3" and Larger	201 – 400	24 Months	Upon Failure
Commercial	3" and Larger	0 – 200	36 Months	Upon Failure
Sample	Not Applicable	Not Applicable	Bi-Annually ¹	Upon Failure

1) Based on age segment (1960's, 1961 – 1969, 1970 – 1979, etc.)

9.2.3 Conservation Pricing

Retail Conservation Pricing (BMP 1.4)

Retail Water Services Rates

Definition: Conservation pricing provides economic incentives (a price signal) to customers to use water efficiently. Because conservation pricing requires a volumetric rate, metered water service is a necessary condition of conservation pricing.

This BMP is intended to reinforce the need for water agencies to establish a strong nexus between volume-related systems costs and volumetric commodity rates. Conservation pricing requires volumetric rates. The goal of this BMP is to recover the maximum amount of water sales revenue from volumetric rates that is consistent with utility costs (which may include utility long-run marginal costs), financial stability, revenue sufficiency, and customer equity. In addition to volumetric rates, conservation pricing may also include service connection charges, meter service charges and/or special rates and charges for temporary service, fire protection service and other irregular services provided by the utility.

The following volumetric rate designs are potentially consistent with the above definition:

- 1) Uniform rate in which the volumetric rate is constant regardless of the quantity consumed
- 2) Seasonal rates in which the volumetric rate reflects seasonal variation in water delivery costs
- 3) Tiered rates in which the volumetric rate increases as the quantity used increases
- 4) Allocation-based rates in which the consumption tiers and respective volumetric rates are based on water use norms and water delivery costs established by the utility

Coverage requirements: Maintain a rate structure that satisfies at least one of the two options listed in the CUWCC's MOU. Conformance will be assessed by using (1) most recent year data or (2) average revenue from three most recent years when most recent year data does not satisfy the option.

Compliance method: EMWD has met the coverage requirements in the following ways:

In February 2009, EMWD implemented an allocation-based tiered rate structure for single family residential, multi-family residential and landscape accounts. The rate structure was instituted to promote the efficient use of water, and is designed to provide customers a significant economic incentive to use the proper amount of water required to serve indoor and outdoor (landscape) demands. This is accomplished by setting a customized "allocation" for each customer account based on a variety of factors such as: irrigated area, daily weather characteristics, size of household, and other more unique characteristics such as the presence of a pool, livestock or medical needs. Water is then sold to customers under a four tier structure based upon their monthly allocation which varies for landscape use relating to daily weather patterns. Customers using water within their allocation purchase water in the lower two tiers. Customers using in excess of their allocation also purchase water in the remaining two tiers that generally will result in relatively high water bills which can send a strong price signal for excessive use. The tiered rate structure was also designed so that 70 percent of the rate is variable.

Retail Wastewater Rates

Conservation pricing of sewer service provides incentives to reduce average or peak use, or both. Such pricing includes: (a) rates designed to recover the cost of providing service, and (b) billing for sewer service based on metered water use.

The following characterizes conservation pricing of sewer services:

- 1) Uniform rates in which the unit rate is the same across all units of service
- 2) Increasing block rates in which the unit rate increases as the quantity of units purchased increases
- 3) Rates in which the unit rate is based upon the long-run marginal cost or the cost of adding the next unit of capacity to the sewer system

Rates that charge customers a fixed amount per billing cycle for sewer service regardless of the unit of service consumed; and/or rates in which the typical bill is determined by high fixed charges and low commodity charges do not satisfy the definition of conservation pricing of sewer services.

Coverage requirements: Maintain a rate structure for sewer service consistent with the characteristics of conservation pricing for services.

Compliance method: EMWD has met the coverage requirements in the following ways:

EMWD complies with an at least as effective approach. EMWD and RCWD, its largest sub agency, both have allocation-based tiered rate billing structures. The allocation-based tiered rate billing structure sends a strong price signal against using excessive water both indoors and outdoors. EMWD also uses the household size provided water budgets to tier sewer pricing. Finally, EMWD recycles all of its wastewater and reuses it within the service area. These method are at least as effective as a conserving rate structure for wastewater.

9.2.4 Public Education and Outreach

California water agencies have played a major role in promoting water use efficiency through both public information and school education programs. EMWD's Public and Governmental Affairs and Education Programs for its retail service area are described below.

Public Information Programs (BMP 2.1)

Public information programs are an effective tool to educate customers about the need for water use efficiency and to influence customer behavior towards conservation. The following actions are necessary to implement a public information program to promote water conservation and related benefits:

- Public speakers to employees, community groups and the media
- Advertising using paid and public service
- Customer communication using bill inserts and on bill comparison charts for multi-year usage
- Coordination with government agencies, industry groups, public interest groups and media
- Marketing designed to change attitudes and influence behavior

Coverage requirements: Maintain an active public information program to promote and educate customers about water conservation and water use efficiency. Minimum program components consist of: (1) providing public speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills; providing public information to promote water conservation measures and coordinating with other government agencies, industry groups, public interest groups and the media; (2) social marketing elements which are designed to change attitudes and influence behavior. This includes seeking input from the public to shape the water conservation message, training stakeholders outside the utility staff in water conservation priorities and techniques; and developing partnerships with stakeholders who carry the conservation message to their target markets; and (3) wholesale agency or another lead regional agency may operate all or part of the education program.

Compliance method: EMWD has met the coverage requirements in the following ways:

- 1) EMWD provides public speakers at new employee orientation which is conducted twice each year; provides information to employees via intranet updates on a regular basis; and occasionally provides employees with fact sheets or talking points on industry issues that may be topics of discussion with individuals outside of EMWD. Public speakers are also provided to community groups, in a variety of settings such as rotary clubs, homeowners associations, religious organizations, mobile home parks, etc. EMWD's active speakers' bureau provides multiple presentations each month. EMWD maintains an active relationship with reporters by phone, email and direct contact regarding topical issues relating the need to encourage water use efficiency throughout its service area. EMWD utilizes a number of means for paid advertising such as the Riverside County Fair program, various Chambers of Commerce programs and newsletters, and Community Council newsletters. Monthly cable slides are used for public service advertising. Customer communication includes bill inserts, bill messaging, monthly usage comparisons on the water bills and bi-monthly newsletters.
- 2) EMWD provides public information to promote water conservation measures. In an effort to affect changes in attitude and influence behavior, EMWD has active pages on common social

media sites that are updated regularly, and a conservation website that is updated on a regular basis. Addressing the subject of training stakeholders, EMWD has hosted and/or conducted workshops for landscape professionals, providing certification opportunities for smart irrigation controller technologies. EMWD's Board members hold Director Advisory Committee meetings with stakeholders throughout the year; and staff members attend/participate at local city councils, planning commissions, and chambers of commerce events.

- 3) EMWD's Education Program uses a variety of grade-appropriate curriculum to educate area students about the importance of water use efficiency. Through its wide range of programs, EMWD reaches more than 60,000 students per year. The long-term objective of the program is to establish positive water use efficiency habits at a young age in order to have a future generation of ratepayers who understand the importance of using water efficiently. Among the programs offered are: school assembly programs, field trips to the San Jacinto Wetlands and Education Center, classroom presentations, annual "Write-Off" contests where students write and illustrate a water-themed book, and participation in regional poster contests.

EMWD participates in MWD's regional rebate programs administered through SoCal Water\$mart for residential and commercial customers.

School Education Programs (BMP 2.2)

School education programs have been implemented to reach the youngest water users at an early age and reinforce the need to engage in water conservation as a life-long behavior. The following actions are necessary to implement school education programs to promote water conservation and related benefits:

- 1) Provide instructional assistance to school districts and private schools within service area
- 2) Provide educational materials and classroom presentations that identify urban, agricultural and environmental issues and conditions in the local watershed
- 3) Develop and/or provide grade appropriate educational materials that meet the state education framework requirements

Coverage requirements: Maintain an active school education program to educate students in the agency's service area about water conservation and efficient water use. Minimum program components consist of: (1) implement a school education program to promote water conservation and related benefits; (2) work with school districts and private schools in the service area to provide instruction assistance, educational materials and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials must meet the state education framework requirements; and (3) wholesale agency or another lead regional agency may operate all or part of the education program.

Compliance method: EMWD has met the coverage requirements in the following ways:

- 1) EMWD has a very robust school education program that promotes water conservation and all aspects of environmental education. Additionally, EMWD works very closely with public and private schools within both its retail and wholesale service areas to provide educational materials which are in alignment with the California content standards for grades K-12.
- 2) EMWD provides classroom presentations covering water conservation, potable water treatment, wastewater treatment, and all aspects of environmental education. EMWD sponsors weekly field trips for students in eleven school districts throughout EMWD's service area to tour one of EMWD's wastewater treatment facilities and wetlands project and includes water education activities that are conducted in the education facility. EMWD provides materials developed by EMWD education staff and the MWD and for K-12 students. EMWD has also developed a variety of curriculum for K-5 students including.
 - Wastewater Treatment for All Curious Beings – activity book

- Dewie the Dragon – curriculum packet
- Gobi’s Adventure – curriculum packet
- Otis the Turtle gets Water Wise – curriculum packet
- Lily and the Seven Drops
- Bartholomew the Bird Investigates How to Use Water Wisely

The following contests are also promoted by EMWD on a quarterly basis:

- Grades K-5 Students – Poster contest “Water Use it Wisely” and “Get Savvy About Water Conservation”
- Grades 6-8 Students – Language Arts contest (resulted in a published book, written & illustrated by 6-8 grade students)
- Grades 9-12 Students – Solar Cup event (MWD provides boat hull for students to assemble and EMWD provides financial support for students to outfit the boat with a motor and solar panels)

EMWD participates in the following school and community activities:

- Environmental, science, health, and community fairs – provide activities and materials
- Annual environmental youth conference – provided in partnership with other agencies
- Sponsoring an environmental assembly program for schools in EMWD’s service area

EMWD offers the following assistance for teachers in the service area:

- Financial assistance to take the online college-level course “Teaching the Water Story” (EMWD, in partnership with other local agencies, developed an online college-level course, “Teaching the Water Story.” This course is offered to students worldwide through Fresno Pacific University)
- Training programs offered by EMWD and MWD
- Training workshops offered by EMWD in partnership with other agencies to spotlight programs
- Training for Project WET offered

EMWD is one of MWD’s member agencies, as such MWD has taken the lead as the wholesale agency in the Student Art Program and the Annual Solar Cup Event. MWD has also provided curriculum for K-12 students.

9.2.5 Programs to Assess and Management Distribution System Real Loss

Water Loss Control (BMP 1.2)

The goals of modern water loss control methods include both an increase in water use efficiency in the utility operations and proper economic valuation of water losses to support water loss control activities. In May 2009, the AWWA published the 3rd Edition M36 Manual “Water Audits and Loss Control Programs.” BMP 1.2 incorporates these new water loss management procedures and applies them in California. Agencies are expected to use the AWWA Free Water Audit Software to complete their standard water audit and water balance. For the 2015 UWMP, water agencies are required to calculate water loss using the AWWA software as discussed in *Chapter 4 – System Water Use*.

Coverage requirements: (1) Compile the standard water audit and balance annually, using the AWWA software, and beginning in the 2nd year of implementation agencies are to test source, import, and production meters annually. (2) During the first four years of implementation, agencies shall improve the data accuracy and data completeness of the standard water balance, and achieve a “Water Audit Data Validity” score of 66 or higher using the AWWA software; and achieve data validity level IV no later than the end of the 5th year of implementation. (3) During the first four years of implementation, seek training in the AWWA water audit method and component analysis process, and complete a component analysis of real losses; and update analysis no less than every four years. (4) During years five through ten

of implementation, agencies shall demonstrate progress in water loss control performance as measured by the AWWA software real loss performance indicator “gallons per service connection per day;” gallons per mile of mains per day;” or achieving a performance indicator score that is (a) less than the agency’s score the previous year; (b) less than the average of the agency’s scores for the previous three years; (c) in the top 20 percent of all signatory agencies reporting with a Data Validity Level IV or (d) in year six and beyond, reducing real losses to or below the benchmark value determined by the Council’s process. (5) Repair all reported leaks and breaks to the extent cost effective, establish and maintain a record keeping system for the repair of reported leaks by the end of year two, and include estimated leakage volume and repair cost to report by the end of year four. (6) Locate and repair unreported leaks to the extent cost effective.

Compliance method: EMWD has met the coverage requirements in the following ways:

- 1) EMWD has compiled the standard water audit report for FY 2014/2015 and submitted it to CUWCC in February of 2016. The following methods are used to test source, import and production meters:

Source Meters: Well meters are recalibrated annually. Filtration Plant and Desalter system supply meters are monitored against the raw water supply meters and serviced as needed. A program for scheduled meter maintenance is being developed.

Import Meters: MWD tests their connection meters bi-annually. EMWD’s system meters are recalibrated annually and flows are monitored daily. Significant differences with MWD deliveries are addressed jointly between EMWD and MWD.

Production Meters: Production meters are bench tested by a certified independent laboratory. A plan to do volumetric testing at the sites is being developed.

- 2) EMWD has contracted with a qualified water loss control consultant, Water System Optimization, Inc. (WSO) to do an audit and balance; evaluate existing data, methods and procedures, and recommend a phased program of improvements to data accuracy and completeness. EMWD will pursue phased implementation of recommended improvements based on justification and cost effectiveness. EMWD currently has a Water Audit Data Validity score of 78.
- 3) Staff has attended AWWA sponsored training and a large cross section of staff attended a kick-off meeting to explain objectives and methodology.
- 4) EMWD has completed two component analyses of real losses for FY 2009/2010 and FY 2013/2014.
- 5) EMWD repairs reported leaks and breaks to the extent that are cost effective. Currently, a work order tracking system is used to track pipeline and service leaks by type and completed repairs. This system is effective on a general scale; however, a more detailed system is needed to identify and track leaks more accurately. WSO will assist EMWD in developing a detailed tracking system.
- 6) In order to identify unreported leaks, a continuous water use notification system was implemented in February 2016 which notifies customers of the presence of a constant water flow running through their meter (for every hour for several days), which is a strong indication of a possible leak.

9.2.6 Water Conservation Program Coordination and Staffing Support

Conservation Coordinator (BMP 1.1.1)

Coverage requirements: Staff maintains the position of trained conservation coordinator, or equivalent consulting support, and provides that function with the necessary resources to implement BMPs.

Compliance method: EMWD has met the coverage requirements for this practice; full time Conservation staff consists of one conservation analyst one conservation program manager, two conservation program specialists, and one conservation program assistant.

The conservation analyst serves as a liaison between EMWD and other public agencies, community and industry groups, and the media; recommends, develops and coordinates implementation of EMWD conservation programs; and assists in analyzing program goals, performance measures, and sources of funding. The conservation program manager participates in the implementation of conservation programs; develops and implements programs to inform, educate and assist with efficient water use and conservation; represents EMWD with customers in community events and meetings regarding conservation issues; and develops and implements methods to measure improvements in water use efficiency and customer satisfaction. The conservation program specialists assist in the development and implementation of conservation programs; conduct water leak investigations; issue citations to enforce mandatory water conservation ordinances during times of water shortage; and represent EMWD with customers and community events and meetings on conservation issues. The conservation program assistant performs a variety of customer service functions related to water conservation; assists with residential, landscape and CII water surveys; measures landscape area for water budgets; sends water waste notices; researches problems; and conducts related duties assigned.

9.2.7 Other Demand Management Measures

Residential (BMPs 3.1, 3.2, 3.3, and 3.4)

Residential water users throughout California depend on a reliable and safe supply of water for their homes. This BMP will define the best and most proven water conservation methods and measures that SFR and MFR customers, working in conjunction with water agencies, can implement to increase water use efficiency and reliability.

Compliance with the Residential Programmatic BMP category can be achieved by two approaches; traditional implementation as prescribed by the components of the BMP category or by the Flex Track Menu Alternatives option.

The traditional approach includes completing the coverage requirements, as defined in the BMP category for residential water surveys, residential plumbing retrofits, high efficiency washing machines and toilet replacements.

The Flex Track Menu Alternative allows an agency to achieve water savings by implementing alternative programs that are able to track water savings and/or focusing on one or more of the prescribed components of the BMP category.

Residential Assistance Program (BMP 3.1)

Traditional coverage requirements: Determine the current number of SFR accounts and MFR units in EMWD's service area. Provide site specific leak detection assistance that may include, (a) water conservation surveys; (b) water efficiency suggestions; and/or (c) inspection, to an average of 1.5 percent per year of current SFR accounts and 1.5 percent per year of MFR units during the 10-year period covering FY 2009/2010 – FY 2018/2019. After meeting the 15 percent target, program maintenance will continue at a level of high-bill complaints with a minimum of 0.75 percent per year for SFR accounts and 0.75 percent per year MFR units. WSS showerheads and faucet aerators may be provided to customers as needed.

Approach: In 1997 EMWD's Conservation staff began performing residential surveys on a limited basis; during FY 2007/2008 and a portion of FY 2008/2009 these surveys were outsourced to a third party. In early 2009, the number of Conservation staff members increased, and in April 2009 the function of performing residential surveys was resumed by internal staff. With a dramatic increase in field and office work in August 2013, the residential surveys were outsourced to a new vendor "Water-Wise Consulting" and to date the vendor continues to perform both residential and multi-family home surveys. More than

4,111 surveys have been completed since 1997. Components of the indoor water survey include checking the water meter leak detector and testing the water meter for accuracy; testing flow rates for kitchen faucet, bathroom faucet(s) and showerhead(s) to determine gallons per minute (gpm); verify toilet(s) gallons per flush and perform a leak detection dye test on each toilet; verify use of dishwasher, hot water heater setting and clothes washer type. Upon completion of each survey, the customer is provided with a report that includes survey results and water efficient recommendations, along with information on incentives for eligible water saving devices when available. Showerheads, aerators and toilet flappers are distributed with surveys as needed.

In addition to surveys EMWD provides leak detection assistance to customers through the distribution of conservation packets. On average, staff members also distribute more than 250 conservation packets to residential customers each month. These packets are available in both English and Spanish to accommodate the needs of a majority of EMWD's residential retail customers. Conservation packets provide the customer with information on how to read their water meter, leak detection dye tablets for toilets, and instructions on how to identify leaks in the home.

In January 2010, EMWD began to distribute Outdoor Water Use Efficiency Kits to residential customers. The Outdoor Water Use Efficiency Kit is designed to help residential customers create a custom irrigation schedule, repair a leaky hose and eliminate water running from an unattended hose. To date 1,068 outdoor kits have been distributed. Since 1990, EMWD has maintained a program to provide residential customers with water efficient showerheads and faucet aerators; over 65,000 devices have been distributed to SFR and MFR customers. These devices continue to be distributed when needed and are made available to customers at EMWD's office, as part of the residential survey program and at various outreach events.

EMWD has determined that the current number of SFR accounts for FY 2013/2014 amount to 129,811 and MFR units amount to 30,568.

This BMP will continue to be met through the Flex Track option using various methods listed above.

Landscape Water Survey (BMP 3.2)

Traditional coverage requirements: Determine the current number of SFR accounts in EMWD's service area. Perform site specific landscape water surveys to an average of 1.5 percent per year of current SFR accounts during the first 10 years. After completing the 15 percent target, program maintenance will continue at a level of high-bill complaints with a minimum of 0.75 percent per year for SFR accounts.

Approach: EMWD has determined that the current number of SFR accounts for FY 2013/2014 amount to 129,811. The landscape water survey requirement is being met through the implementation of tiered rates. A water budget for efficient landscape irrigation was developed for all residential customers. The water budget is enforced monthly through a tiered billing system. For those who exceed budget targets a residential survey may be performed to assist the customer in identifying where water can be saved. Staff members and/or the vendor perform on-site landscape surveys as part of the complete residential survey. Components of the outdoor water survey for SFR accounts include checking the water meter leak detector and testing the water meter for accuracy; checking irrigation timer programming; running a one minute test for each irrigation station to obtain gpm data and checking for system leaks; checking system pressure; obtaining plant and soil type(s) for reporting and measuring irrigated landscape area. Upon completion of each survey, the customer is provided with a report that includes survey results and a watering schedule, water efficient recommendations, and information on incentives for eligible water saving devices when available. EMWD has also developed a cost share program for the direct installation of residential smart irrigation controllers, high-efficiency precision nozzles, and on-site landscape surveys as a component of this program.

This BMP will be met through the Flex Track option as described above.

High Efficiency Clothes Washers (BMP 3.3)

Traditional coverage requirements: Provide financial incentives or institute an ordinance requiring the purchase of High Efficiency Clothes Washers (HECW) to meet an average water factor value of 5.0. Financial incentives shall be provided for the purchase of HECWs to 0.9 percent of current SFR accounts during the first reporting period and 1.0 percent per year for the remainder of the 10-year period. An alternative method is to demonstrate 1.4 percent per year of the market penetration during the first ten years.

Approach: EMWD has determined that the current number of SFR accounts for FY 2013/2014 amount to 129,811 and MFR units amount to 30,568. EMWD has provided incentives for HECWs since 2001 and to date an estimated 15,788 HECWs have received financial incentives, of which approximately 14,736 have an average water factor of 5.0 or less. In late 2010, EMWD established partnerships with USBR through grant funding, and Southern California Gas Company, for the direct installation of 1,700 HECWs with a water factor of 4.0 or less.

This BMP will be met through the Flex Track option with EMWD's incentive program and direct install program.

WaterSense Specification Toilets (BMP 3.4)

Traditional coverage requirements: Provide incentives or an ordinance requiring the replacement of toilets using 3.5 or more gallons per flush with toilets meeting WSS. Compliance will entail demonstrating a number of toilet replacements of 3.5 gallons per flush or greater toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75 percent is demonstrated, whichever is sooner.

Approach: EMWD began offering incentives for toilet retrofits in 1992, beginning with Ultra Low-Flush Toilets (ULFT). Incentives included customer rebates and free distribution events. Incentives for High Efficiency Toilets (HET) were added in 2005. HET incentive programs included customer rebates, free distribution events and a direct installation program which began in 2008. Since the program's beginning in 1992, EMWD has provided incentives for approximately 17,371 ULFTs and approximately 25,414 HETs. To continue to encourage the installation of water saving devices, the Replace and Save Multi-Family Toilet Program was implemented in 2014 and was targeted towards multi-family customers to help reduce or eliminate the cost associated with replacing older inefficient toilets with new efficient toilets. The program was completed in 2015 and resulted in the direct installation of 1,269 toilets with a water factor of 1.0 or less.

This BMP will be met through the Flex Track option with EMWD's direct installation programs conducted during FY 2008/2009 through FY 2013/2014.

Commercial, Industrial, and Institutional (BMP 4)

CII water demands make up a large percentage of total demand for California. CII water use varies dramatically between business sectors as well as within a given water agency's territory. The goal of this BMP is to implement comprehensive yet flexible BMPs, allowing each water agency to tailor the implementation of each practice to fit local needs and opportunities. The end result is a practice that is successful and will produce the greatest amount of cost-effective water savings.

Traditional coverage requirements: Implement measures to achieve the water savings goal for CII accounts of 10 percent of the 2008 baseline water use over a 10-year period. To remain on track to meet the annual water savings goal, estimated savings for the first two-year reporting period may be up to 0.5 percent followed by 2.4 percent by the end of year four; 4.3 percent by the end of year six; 6.4 percent by the end of year eight; and 9 percent by the end of year 10. EMWD uses FY data and reporting periods are as follows:

- 1) FY 2008/2009 – FY 2009/2010 (first two-year reporting period)

- 2) FY 2010/2011 – FY 2011/2012 (end of year four)
- 3) FY 2012/2013 – FY 2013/2014 (end of year six)
- 4) FY 2014/2015 – FY 2015/2016 (end of year eight)
- 5) FY 2016/2017 – FY 2017/2018 (end of year ten)

Compliance method for CII Programmatic BMP: Baseline water use for EMWD's CII customers in 2008 was a total of 7,763 AF. Credit for prior activities, as reported through the BMP database, will be given for up to 50 percent of the goal. EMWD is in compliance with the CII Programmatic BMP through an at-least-as-effective approach. Because of the savings potential and customer response to programs, EMWD has exceeded water conservation targets in the residential and landscape sectors. The sum of savings from BMP 3, 4 and 5 exceed the sum of the targets for BMP 3, 4 and 5. Therefore the additional saving in the residential and landscape sectors is at least as effective as implementing additional savings by CII customers. This is reflected in EMWD's 2013/2014 compliance report.

EMWD continues to encourage efficiency by CII customers. Financial incentives provided for by MWD for a variety of water efficient devices used in the CII sector are administered through the SoCal WaterSmart regional rebate program. In 2008, EMWD implemented the Public School Retrofit program; providing surveys and direct installation of both indoor and outdoor devices for more than 40 school sites within EMWD's retail service area. In 2009, conservation staff developed a program to identify CII accounts with mixed use meters, accounts with the highest water use are contacted first and offered CII water use surveys; to date an estimated 4,406 accounts have been contacted and 365 surveys have been completed. Components of the CII water use survey include checking the water meter leak detector and testing the water meter for accuracy; checking irrigation timer programming; running a one minute test for each irrigation station obtain gpm data and check for system leaks; checking system pressure; obtaining plant and soil type(s) for reporting and measuring irrigated landscape area. Upon completion of each survey, the customer is provided with a report that includes survey results and a watering schedule, water efficient recommendations, and information on incentives for eligible water saving devices when available.

Landscape (BMP 5)

Irrigation accounts for a large portion of urban water use in California. Irrigation water use varies dramatically depending on water pricing and availability, plant choice, geographic locations, seasonal conditions, and the level of commitment to sound water efficiency practices. The goal of this BMP is that irrigators, with assistance from signatories, will achieve a higher level of water use efficiency consistent with the actual irrigation needs of the plant materials. Reaching this goal would reduce overall demands for water, reduce demands during the peak summer months, and still result in a healthy and vibrant landscape in California.

Agencies shall provide non-residential customers with support and incentives to improve their landscape water use efficiency. Credit will be given for documented water savings for prior activities through 2008.

Accounts with Dedicated Irrigation Meters

Traditional coverage requirements: (1) Identify accounts with dedicated irrigation meters and assign ETo-based water budgets equal to no more than an average of 70 percent of annual average local ETo per square foot of landscape area. (2) Provide notices each billing cycle showing the relationship between the budget and actual consumption. (3) Offer site-specific technical assistance to reduce water use to those accounts that are 20 percent over budget at a rate of nine percent per year with 90 percent over 10 years. (4) Implement and maintain a customer incentive program for irrigation equipment retrofits.

The MWELo currently requires 70 percent ETo; should this ordinance be revised to reduce water allowance, this BMP will be revised automatically to reflect that change.

Recreational areas (portions of parks, playgrounds, sports fields, golf courses, or school yards in public and private projects where turf provides a playing surface or serves other high-use recreational purposes) and areas permanently and solely dedicated to edible plants, such as orchards and vegetable gardens, may require water in addition to the water use budget. These designated areas may not exceed 100 percent ETo on an annual basis.

Approach: (1) Through the tiered rate process, EMWD has developed water budgets for 100 percent of dedicated landscape accounts; (2) Water bills for these accounts include data that reflect the relationship between the water budget 70 percent ETo and actual usage; (3) Each water bill for dedicated landscape meters provides a contact number with an offer for assistance. An audit program and technical assistance are made available to customers that make a request; and (4) EMWD has offered financial incentive programs for landscape since 1992, including large landscape audits, soil moisture sensors, weather-based irrigation controller (WBIC) rebates and distribution, large rotary nozzle rebates, and rotating nozzle and synthetic turf rebates. In 2006, EMWD implemented a program to supplement the cost of high efficiency nozzles, including labor for installation, for large landscape accounts. In 2008, EMWD also implemented a public school retrofit program that includes the direct installation of WBICs and high efficiency nozzles. In 2012, EMWD implemented the Large Landscape Assistance Program which provides large landscape customers with the option to have Toro precision nozzles directly installed or receive a voucher for high efficiency nozzles and smart controllers. To date, 41,347 nozzles and 102 smart controllers have been installed.

Commercial, Industrial, Institutional Accounts without Meters or with Mixed-Use Meters

Traditional coverage requirements: (1) Develop and implement a strategy, targeting and marketing large landscape water use surveys to CII accounts with mixed-use meters. (2) Complete irrigation water use surveys for not less than 15 percent of all CII accounts with mixed-use meters within 10 years at an average rate of 1.5 percent per year. (3) Implement and maintain a customer incentive program for irrigation equipment retrofits.

Approach: (1) EMWD's retail service area includes an estimated 4,500 CII accounts. (2) In July 2009, Conservation staff developed a program to identify CII accounts with mixed use meters and offer on-site surveys, to date 4,406 accounts have been contacted and 365 surveys have been completed. (3) EMWD has offered financial incentive programs for landscape since 1992, including large landscape audits, soil moisture sensors, WBIC rebate and distribution, large rotary nozzle rebates, rotating nozzle and synthetic turf rebates.

9.3 Wholesale Area Demand Management Measures

As a wholesale agency, EMWD is responsible for implementing a subset of the CUWCC BMPs as well as assisting its wholesale customers with their own BMP implementation. EMWD works closely with its wholesale customers to help fund, market, and implement a number of BMP programs.

9.3.1 Metering

All of EMWD's wholesale customers are fully metered and billed volumetrically each month.

9.3.2 Public Education and Outreach

As a wholesale agency, EMWD maintains extensive Public Information and School Education Programs for all of its wholesale customers.

Public Information Programs

As a wholesale agency, EMWD takes the lead in an annual landscaping competition with customers from EMWD, Western Municipal Water District, Inland Empire Utilities Agency, and the respective sub agencies. EMWD provides support to other water agencies during Community Water Conservation Festivals and other related functions. EMWD has initiated a long-term campaign to encourage all

customers to use water wisely. EMWD sponsors workshops on California-friendly plants to promote landscaping using drought tolerant plants and the Water Waste Program to report/correct the wasteful use of water. The New Residential Development Campaign is targeted at new residential customers and consists of a welcome letter, a quarterly newsletter containing seasonal tips and ideas for water conservation, and a survey. EMWD enforces local and state landscape ordinances through the use of budget based tiered rates.

School Education Programs

As discussed in Section 9.2.4, EMWD implements an Education Program to foster understanding of water and wastewater issues and to promote wise water use among the future leaders of the community. EMWD supports an extensive education program designed to provide a useful academic experience at all grade levels (K-12). Any school within EMWDs sphere of influence and beyond is eligible to benefit from the program. EMWD offers resources such as lesson plans, curriculum packets, and student materials.

As a wholesale agency, EMWD has created the language arts program “Write Off” for middle school students, and is the lead agency in partnership with RCWD, a sub agency of EMWD. Multiple presentations, which include complete curriculum packets, have resulted from this program, and agencies throughout California and other states have either duplicated the program or have requested materials to add to their current education programs.

9.3.3 Water Conservation Program Coordination and Staffing Support

Conservation Coordinator

As mentioned in Section 9.2.6, EMWD maintains full-time Conservation staff including one conservation analyst, one conservation program manager, two conservation program specialists, and one conservation program assistant.

9.3.4 Other Demand Management Measures

EMWD’s wholesale agencies’ customers are eligible to participate in the region-wide rebate program offered through MWD. EMWD has also worked with wholesale customers to implement agency administered programs funded in part by MWD. EMWD provides support and information about water use efficiency to sub agencies, and offers training opportunities in landscape efficiency. EMWD also partners with wholesale customers on an annual water festival for customers that promote water use efficiency.

EMWD has a volume based rate structure for wholesale customers.

9.3.5 Asset Management

EMWD’s wholesale distribution system asset management program is the same as its retail asset management program.

The mission of EMWD is to deliver value to customers and the communities within the EMWD’s service area by providing safe, reliable, economical and environmentally sustainable water, wastewater and recycled water services. One of the ways this mission is carried out is through the EMWD’s Asset Management program. This program was established to effectively manage assets throughout their lifecycle. The underpinnings of this program are rooted research of other water agencies that have implemented Asset Management Plans.

One of the key components of the program is EMWD’s Computerized Maintenance Management System. This system is a transactional database system that is used to capture physical attributes as well as work activities performed on assets. Asset technicians manage the asset records during new construction, refurbishment and replacements. Two of the initial attributes captured for asset records are installation date and original purchase price. In addition, other important data is collected such as horsepower, rpm,

power requirements, etc. Asset grouping is employed to compare histories of like assets. Further analysis may provide insight on premature failures and lead to the procurement of better performing assets.

The lifecycles of assets are determined by a number of factors. Due to the nature of business at EMWD, assets may be found in office, potable water, wastewater and recycled water operating environments. Wastewater produces the harshest operating conditions and, therefore, decreases the life of an asset more than other EMWD environments. Another factor that impacts the life of an asset is its expected life. Empirical data is the best indicator for predicting an asset's expected life. This takes into account the operating conditions of the asset at a particular location using real-world parameters. However, this method takes time to build history from maintenance activities. An alternative method entails using industry standards from similar operations. Combining these factors allows for the remaining life of assets to be calculated.

An Asset Management model was produced to provide a framework for business decisions related to the replacement and refurbishment (R&R) of EMWD's assets. The inputs to the model include the physical location, remaining life expectancy, and the corrective maintenance costs. The health of an asset can be determined, in part, by the cost of maintenance relative to like assets. For example, if a potable pump historically costs more to maintain than another potable pump operating under similar conditions it should be further analyzed to understand the cause. Another input to the model includes EMWD's Capital Improvement Projects. By including Capital Improvement Project commitments into the model, assets that are likely candidates based on maintenance costs or end of life may be excluded from R&R consideration.

Output from the Asset Management model is provided to management for budget preparation. Assets may be grouped by site for a holistic review. Furthermore, the model allows for grouping of assets by maintenance responsibility whether electrical, mechanical or other maintenance group. Management can easily review assets nearing end of life or with higher than usual maintenance costs. Assets are earmarked for budget inclusion or deferred to a future budget cycle. These decisions are recorded in the Asset Management model for future reference.

9.3.6 Wholesale Supplier Assistance Program

Wholesale Agency Assistance Programs (BMP 1.1.3)

Coverage requirements: (a) Wholesale agency programs include financial investments and building partnerships, when mutually agreeable and beneficial to a wholesaler and its retail agencies, and cost effectiveness assessments, including avoided cost per AF, for each BMP the wholesale agency is potentially obligated to support. (b) When requested, the wholesale agency will provide technical support, incentives, staff or consultant support, and equivalent resources to retail members to assist or otherwise support the implementation of BMPs. (c) When mutually beneficial to a wholesaler and its retail agencies, a wholesaler may offer program management and BMP reporting assistance to its retailers. Wholesale agencies have limited control over retail agencies, thus wholesale agencies cannot be held responsible for levels of implementation by individual retailers in their wholesale service area. (d) Water shortage allocation plans or policies will encourage and reward investment in long-term conservation. (e) Wholesale water agencies will report on non-signatory BMP implementation, when possible. (f) Wholesale agencies will encourage CUWCC membership and offer recruitment assistance.

Compliance method: EMWD has met the coverage requirements in the following ways:

- a) Financial incentives provided for by MWD for a variety of water efficient devices are administered through the SoCal WaterSmart regional rebate program for residential and commercial customers. Both residential and commercial customers of EMWD's sub agencies are eligible to participate in the regional rebate programs.
- b) EMWD has hosted and/or conducted workshops for landscape professionals, including personnel and customers of EMWD's sub agencies, providing certification opportunities for smart irrigation

controller technologies. EMWD's Board members hold Director Advisory Committee meetings with stakeholders throughout the year; and staff members attend/participate at local city councils and planning commissions. EMWD also provides assistance to sub agencies with various GIS mapping requests.

- c) EMWD is the first water agency in Riverside County to offer the Qualified Water Efficient Landscaper (QWEL) professional certification program which provides landscape professionals with 24 hours of education on principles of proper plant selection for the local climate, irrigation system design and maintenance, and irrigation system programming and operation. In order to obtain the QWEL certification an individual must demonstrate their ability to perform an irrigation system audit as well as pass the QWEL exam.
- d) Staff meets with sub agencies to discuss conservation related topics. Regional incentive programs are administered through vendors assigned by MWD and sub agencies are encouraged to participate in these programs. MWD hosts monthly water use efficiency meetings to discuss the implementation of conservation programs; EMWD's sub agencies are encouraged to participate.
- e) Under the WSCP, supply to wholesale customers will be allocated using the formula and methodology based on MWD's WSAP as described in *Chapter 7 – Water Supply Reliability Assessment*. This plan takes into consideration: the impact on retail customers and the economy; population and growth; changes and/or loss of local supply; reclamation and recycling; conservation; and investment in local resources. EMWD will establish base period demands and then adjust them for growth and changes in local supply. Regional shortages will be phased in 10 stages. At each stage the wholesale customers will not experience shortages on the wholesale level that are greater than one-and-a-half times the percentage shortage of regional water supplies; nor will they face a retail shortage less than the regional shortage. Credits will be given for conservation and investment in local supplies.
- f) EMWD will evaluate the feasibility to provide BMP reports for sub agencies that are non-signatories with CUWCC.

EMWD has encouraged sub agencies to become signatories of the CUWCC.

9.4 EMWD Implementation Plan for Water Use Reduction

EMWD estimates water saving have occurred due to ordinances in place, the implementation of tiered rates and active conservation. As discussed in Section 9.5 below, EMWD will continue to improve water efficiency through a budget based tiered rate, requirements for water efficiency in new construction and an active conservation program. Water use reduction will be focused on outdoor demand reduction by all customer types. Even after surpassing its water efficiency target, EMWD estimates that there is the potential for additional conservation savings through 2040.

EMWD will continue to reduce potable water demand to meet the goals of SBx7-7 in two ways: using recycled water to offset potable water demand and reducing demand for water through conservation. In December 2015, EMWD completed a Water Use Efficiency Master Plan which articulates the goals, strategies, and tactics required to deliver long-term solutions for secure and reliable water supplies. The Water Use Efficiency Master Plan helped to identify and update the targets for saving water through active conservation and provided a portfolio of projects and actions that can meet or exceed the requirements of SBx7-7.

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Chapter 10 Plan Adoption, Submittal, and Implementation

10.1 Notice of Public Hearing

EMWD encouraged public participation during the development of the 2015 UWMP and provided opportunities for public review and comment. First, EMWD sent out notices to cities within its retail and wholesale service area and the County of Riverside to inform these stakeholders that the UWMP was being reviewed, modified, and prepared in advance of the 60-day period leading up to the public hearing. Additional notices went out to these agencies announcing when the draft UWMP would be available for public review and announcing the time and date of the public hearing, as documented in Table 10-1 and Table 10-2.

Notices of the public hearing were also published in the local newspaper and placed at the EMWD office. The notice included the time and date of the hearing and stated that the draft UWMP was available for public review and comment until June 15, 2016 at the EMWD office or on EMWD's website. A copy of the public notice is provided in Appendix K.

EMWD conducted the public hearing on June 15, 2016 at the EMWD office to hear and discuss public comments on the draft 2015 UWMP prior to EMWD Board adoption. No written comments were received on the draft UWMP.

Table 10-1: Retail Notification to Cities and Counties

DWR Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Beaumont	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Menifee	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Moreno Valley	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Murrieta	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Riverside	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Temecula	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name	60 Day Notice	Notice of Public Hearing
Riverside County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Table 10-2: Wholesale Notification to Cities and Counties

DWR Table 10-1 Wholesale: Notification to Cities and Counties		
<input checked="" type="checkbox"/>	Supplier has notified 10 or fewer cities or counties. Complete the table below.	
City Name	60 Day Notice	Notice of Public Hearing
City of Perris	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Hemet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of San Jacinto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lake Hemet Municipal Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Nuevo Water Company	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rancho California Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Western Municipal Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Elsinore Valley Municipal Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metropolitan Water District of Southern California	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name	60 Day Notice	Notice of Public Hearing
Riverside County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

10.2 Plan Adoption and Submittal

The 2015 UWMP was adopted by the EMWD Board of Directors on June 15, 2016 by Resolution No. 2016-074 after the public hearing to receive public comments. A copy of the resolution is provided in Appendix L.

The 2015 UWMP will be submitted to DWR electronically prior to the CWC's deadline of July 1, 2016. No later than 30 days after adoption, EMWD will also submit a copy of the 2015 UWMP to the California State Library and to Riverside County and the cities EMWD provides water to. A hard copy of the 2015 UWMP will be made publically available at the EMWD office and an electronic copy of the 2015 UWMP will be available for public viewing on the EMWD website.

10.3 Plan Implementation

EMWD plans to implement the adopted UWMP in accordance with the schedule described in the plan. The 2015 UWMP will be implemented to meet the 2020 urban water use target for retail demand. Daily per capita water use will be reduced through offsetting potable water demands using the methods described in this plan, including increasing the use of recycled water and implementing demand management measures. Any amendments made to this UWMP will require completion of the same series of notification, public hearing, adoption, and submittals as required in submittal of this original 2015 UWMP.



Eastern Municipal Water District 2015 Urban Water Management Plan

FINAL

APPENDICES

Prepared by



June 2016

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Appendix A - DWR UWMP Checklist

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UWMP Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	10.2
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	2.2
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	2.2
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	3.2 and 3.3
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	3.4
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	3.5.1
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	3.6
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	3.5.1
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	4.2
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	4.3

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	4.5
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	5.6
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5 and App E	Chapter 5 and Appendix C
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	5.5 and 5.6
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	5.7
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	Not Applicable
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	5.8
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	5.7 and Appendix C

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	Chapter 6
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	6.3
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	6.3.2 and Appendices E and F
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	6.3.1
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	6.3.2 and 6.3.3
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	Not Applicable
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	6.3.5
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	6.3.4
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	6.8

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	6.9
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	6.6
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	2.2
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	2.2
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	6.7.1
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	6.7.2
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	6.7.2
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	6.7.3

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	6.7.3
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	6.7.3 and 6.7.4
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	6.7.5
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	6.7.5
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	7.7
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	7.1, 7.2, 7.3, 7.5
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	7.5 and 7.6
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	7.1, 7.2, 7.3, 7.6.2
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	7.4

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	7.6
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	8.1
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	8.9
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	8.7
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	8.2.2
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	8.5
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	8.4
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	8.8
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	Appendix I

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	8.3
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	9.2
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	9.3
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	9.1 and Appendix J
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	10.1
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	10.1
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	10.2
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	10.2

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location <i>(Optional Column for Agency Use)</i>
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	10.1 and Appendix K
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	10.1
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Appendix L
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	10.2
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	10.2
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	10.2 and 10.3
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	10.2

Appendix B - DWR Standardized UWMP Tables

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Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3310009	Eastern Municipal Water District	147,300	78,937
TOTAL		147,300	78,937

NOTES: 1) The number of connections and volume of water supplied in this table reflect EMWD's potable water system only. Recycled water connections (500) and volume supplied (44,150 AF) in 2015 is not included.

Table 2-2: Plan Identification		
Select Only One	Type of Plan	Name of RUWMP or Regional Alliance <i>if applicable</i> <i>drop down list</i>
<input checked="" type="checkbox"/>	Individual UWMP	
	<input type="checkbox"/> Water Supplier is also a member of a RUWMP	
	<input type="checkbox"/> Water Supplier is also a member of a Regional Alliance	
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)	
NOTES:		

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
<input checked="" type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables Are in Calendar Years
<input type="checkbox"/>	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES:	

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name <i>(Add additional rows as needed)</i>
Metropolitan Water District of Southern California
NOTES:

Table 2-4 Wholesale: Water Supplier Information Exchange (select one)

<input type="checkbox"/>	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed.
	Provide page number for location of the list.
<input checked="" type="checkbox"/>	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. Complete the table below.
Water Supplier Name <i>(Add additional rows as needed)</i>	
City of Hemet	
City of Perris	
City of San Jacinto	
Elsinore Valley Municipal Water District	
Lake Hemet Municipal Water District	
Nuevo Water Company	
Rancho California Water District	
Western Municipal Water District	
NOTES:	

Table 3-1 Retail: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040(opt)
	546,146	617,100	699,800	784,100	864,200	939,100

NOTES: Retail population for 2015 was estimated using a SWRCB reporting method using 2010 Census data and the American Community Survey for 2014. DWR pre-approved EMWD's methodology for estimating population. Retail population projections for 2020-2040 were estimated using EMWD's Database of Proposed Projects and the 2015 SWRCB estimated population. DWR pre-approved EMWD's methodology for estimating population.

Table 3-1 Wholesale: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040(opt)
	215,075	239,400	267,300	291,100	314,400	335,500

NOTES: Wholesale population for 2015 was estimated using GIS and 2010 Census tract data. Wholesale population projections for 2020-2040 were estimated using EMWD's Database of Proposed Projects and the 2015 population. DWR pre-approved EMWD's methodology for estimating population.

Table 4-1 Retail: Demands for Potable and Raw Water - Actual

Use Type (Add additional rows as needed)	2015 Actual		
<i>Drop down list</i> <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool</i>	Additional Description (as needed)	Level of Treatment When Delivered <i>Drop down list</i>	Volume
Single Family		Drinking Water	45,735
Multi-Family		Drinking Water	5,830
Commercial		Drinking Water	4,603
Industrial		Drinking Water	270
Institutional/Governmental		Drinking Water	2,083
Landscape		Drinking Water	7,735
Agricultural irrigation	Potable Water	Drinking Water	1,924
Agricultural irrigation	Raw Water	Raw Water	941
Agricultural irrigation	Brackish groundwater used to supplement the recycled water system	Raw Water	682
Other	Temporary construction meters, etc	Drinking Water	1,507
Other	Unbilled, authorized consumption	Drinking Water	3,444
Losses	Real and apparent losses	Drinking Water	4,183
TOTAL			78,937
NOTES: 1) In 2015, brackish groundwater was used to supplement the recycled water system due to higher than average agricultural demands. 2) Losses reflect real and apparent losses for fiscal year 2014/2015.			

Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual

Use Type (Add additional rows as needed)	2015 Actual		
Drop down list <i>May select each use multiple times</i> <i>These are the only use types that will be recognized by the WUE data online submittal tool</i>	Additional Description (as needed)	Level of Treatment When Delivered <i>Drop down list</i>	Volume
Sales to other agencies	City of Hemet	Drinking Water	0
Sales to other agencies	City of Perris Water System	Drinking Water	1,542
Sales to other agencies	City of San Jacinto	Drinking Water	0
Sales to other agencies	Nuevo Water Company	Drinking Water	247
Sales to other agencies	Western Municipal Water District Murrieta Division	Drinking Water	728
Sales to other agencies	Rancho California Water District	Drinking Water	4,015
Sales to other agencies	Rancho California Water District	Raw Water	10,925
Sales to other agencies	Lake Hemet Municipal Water District	Raw Water	4,311
Groundwater recharge	Imported water recharge to the Hemet/San Jacinto Basin	Raw Water	0
TOTAL			21,768
NOTES: Groundwater recharge will occur under the Hemet/San Jacinto Water Management Plan			

Table 4-2 Retail: Demands for Potable and Raw Water - Projected

Use Type <i>(Add additional rows as needed)</i>	Additional Description <i>(as needed)</i>	Projected Water Use <i>Report To the Extent that Records are Available</i>				
<i><u>Drop down list</u></i> <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool</i>		2020	2025	2030	2035	2040-opt
Single Family		64,800	72,900	81,100	89,000	96,800
Multi-Family		8,300	9,300	10,300	11,400	12,300
Commercial		6,500	7,300	8,100	8,900	9,700
Industrial		400	400	500	500	600
Institutional/Governmental		3,000	3,300	3,700	4,100	4,400
Landscape		7,500	7,500	7,500	7,500	7,300
Agricultural irrigation	Potable Water	1,900	1,900	1,900	1,900	1,900
Agricultural irrigation	Raw Water	1,000	1,000	1,000	1,000	1,000
Losses	System losses & unbilled, authorized consumption	7,100	7,900	8,800	9,700	10,500
TOTAL		100,500	111,500	122,900	134,000	144,500
NOTES:1) Passive water savings due to the restrictions outlined in the Administrative Code are included in the demand projections for EMWD's retail service area. 2) Landscape demands remain constant/decrease over time as landscape accounts are offset by conversion to the recycled water system. 3) Projections for losses in the table include system losses (real and apparent) and unbilled, authorized consumption.						

Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected

Use Type <i>(Add additional rows as needed)</i>	Additional Description <i>(as needed)</i>	Projected Water Use <i>Report To the Extent that Records are Available</i>				
Drop down list <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool.</i>		2020	2025	2030	2035	2040 (opt)
Sales to other agencies	City of Hemet	0	0	0	0	0
Sales to other agencies	City of Perris Water System	1,800	1,900	2,000	2,100	2,200
Sales to other agencies	City of San Jacinto	0	0	0	0	0
Sales to other agencies	Nuevo Water Company	400	500	600	600	700
Sales to other agencies	Western Municipal Water District Murrieta Division	2,500	3,900	5,200	6,500	7,900
Sales to other agencies	Rancho California Water District	33,600	35,200	36,900	38,600	40,200
Sales to other agencies	Raw Water to Lake Hemet Municipal Water District	4,700	5,100	5,500	5,900	6,300
Groundwater recharge	Imported water recharge to the Hemet/San Jacinto Basin	7,500	7,500	7,500	7,500	7,500
TOTAL		50,500	54,100	57,700	61,200	64,800
NOTES: 1) Deliveries to Lake Hemet Municipal Water District may be in the form of recharge managed through the Hemet/San Jacinto Water Management Plan. 2) Groundwater recharge will occur under the Hemet/San Jacinto Water Management Plan.						

Table 4-3 Retail: Total Water Demands

	2015	2020	2025	2030	2035	2040 (opt)
Potable and Raw Water <i>From</i> <i>Tables 4-1 and 4-2</i>	78,937	100,500	111,500	122,900	134,000	144,500
Recycled Water Demand* <i>From</i> <i>Table 6-4</i>	44,150	45,245	48,334	50,017	51,800	53,300
TOTAL WATER DEMAND	123,087	145,745	159,834	172,917	185,800	197,800

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES:

Table 4-3 Wholesale: Total Water Demands

	2015	2020	2025	2030	2035	2040(opt)
Potable and Raw Water <i>From Tables 4-1 and 4-2</i>	21,768	50,500	54,100	57,700	61,200	64,800
Recycled Water Demand* <i>From Table 6-4</i>	1,235	1,656	4,766	5,183	5,600	5,600
TOTAL WATER DEMAND	23,003	52,156	58,866	62,883	66,800	70,400

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES:

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
07/2014	4,183
<i>* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.</i>	
<p>NOTES: EMWD's retail and wholesale physical facilities are shared. Therefore, losses cannot be easily attributed to one system or the other. For this reason, all of EMWD's water losses are reported in the DWR Table 4-4 for retail. Water Loss includes Real losses (3,497 AF) and Apparent losses (686 AF).</p>	

Table 4-4 Wholesale: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
See retail table	See retail table

** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*

NOTES: EMWD's retail and wholesale physical facilities are shared. Therefore, losses cannot be easily attributed to one system or the other. For this reason, all of EMWD's water losses are reported in the DWR Table 4-4 for retail.

Table 4-5 Retail Only: Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) <i>Drop down list (y/n)</i>	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	Section 4.2.1 and Section 4.4
Are Lower Income Residential Demands Included In Projections? <i>Drop down list (y/n)</i>	Yes
NOTES:	

Table 5-1 Baselines and Targets Summary*Retail Agency or Regional Alliance Only*

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1999	2008	197	187	176
5 Year	2003	2007	195		

*All values are in Gallons per Capita per Day (GPCD)

NOTES:

Table 5-2: 2015 Compliance*Retail Agency or Regional Alliance Only*

Actual 2015 GPCD*	2015 Interim Target GPCD*	Optional Adjustments to 2015 GPCD <i>From Methodology 8</i>					2015 GPCD* <i>(Adjusted if applicable)</i>	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
129	187				0	129	129	Yes

**All values are in Gallons per Capita per Day (GPCD)*

NOTES:

Table 6-1 Retail: Groundwater Volume Pumped

<input type="checkbox"/>		Supplier does not pump groundwater. The supplier will not complete the table below.				
Groundwater Type <i>Drop Down List</i> <i>May use each category multiple times</i>	Location or Basin Name	2011	2012	2013	2014	2015
Add additional rows as needed						
Alluvial Basin	Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) ¹	12,709	10,091	13,828	8,021	9,559
Alluvial Basin	West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	4,756	5,399	4,996	4,016	5,011
Alluvial Basin	Brackish Groundwater from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) ²	7,533	7,139	6,501	9,897	10,089
TOTAL		24,998	22,629	25,325	21,934	24,659
NOTES: 1) There was additional EMWD pumping (641 AF in 2014; 1,284 AF in 2015) in the Hemet/San Jacinto Basin that was wheeled as part of sub-agency groundwater rights under the Hemet/San Jacinto Management Plan. 2) Brackish groundwater pumped from the West San Jacinto Basin is not a direct supply – it is used to feed desalination facilities. The treated volume of this supply is shown in the other supply tables of this chapter as desalinated water instead of groundwater.						

Table 6-1 Wholesale: Groundwater Volume Pumped						
<input checked="" type="checkbox"/>	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type <i>Drop Down List</i> <i>May use each category multiple times</i>	Location or Basin Name	2011	2012	2013	2014	2015
TOTAL		0	0	0	0	0
NOTES:						

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
<input type="checkbox"/>	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2015 service area covered by wastewater collection system <i>(optional)</i>					
	Percentage of 2015 service area population covered by wastewater collection system <i>(optional)</i>					
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? <i>Drop Down List</i>	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? <i>Drop Down List</i>	Is WWTP Operation Contracted to a Third Party? <i>(optional)</i> <i>Drop Down List</i>
<i>Add additional rows as needed</i>						
Eastern Municipal Water District	Metered	7,382	Eastern Municipal Water District	San Jacinto Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	12,389	Eastern Municipal Water District	Moreno Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	15,088	Eastern Municipal Water District	Temecula Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	13,806	Eastern Municipal Water District	Perris Valley RWRF	Yes	No
Total Wastewater Collected from Service Area in 2015:		48,665				
NOTES: Total listed under "Volume of Wastewater Collected from UWMP Service Area 2015" differs from total listed under "Wastewater Treated" in DWR Table 6-3 due to losses in the treatment process.						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015

<input type="checkbox"/>	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional)	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level <i>Drop down list</i>	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
<i>Add additional rows as needed</i>										
San Jacinto Valley Regional Water Reclamation Facility	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	6,884	0	5,157	0
Moreno Valley Regional Water Reclamation Facility	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	11,554	0	8,656	0
Temecula Valley Regional Water Reclamation Facility	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	14,071	0	10,542	0
Perris Valley Regional Water Reclamation Facility	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	12,876	0	9,646	0
Total							45,385	0	34,001	0
<p>NOTES: 1) All four of EMWD's RWRFs are connected through EMWD's regional recycled water system with one discharge point.</p> <p>2) Total listed under "Wastewater Treated" differs from the total listed under "Volume of Wastewater Collected in 2015" in DWR Table 6-2 due to losses occurring during treatment process.</p> <p>3) Because all four RWRFs are connected through one regional recycled water system, it is not possible to distinguish the volume of water recycled from each individual facility. Volumes recycled from each facility in the table were estimated based on the proportion of wastewater collected and treated at each plant compared to the total volume of wastewater treated.</p> <p>4) The balance between the total "Wastewater Treated" and the total volume "Recycled Within Service Area" represents EMWD's system losses (such as storage pond evaporation and incidental recharge).</p> <p>5) Recycled water sold to RCWD and EVMWD is included in the total volume recycled within EMWD's service area and not reported separately in the DWR Table 6-3 for wholesale. Recycled water delivered to wholesale customers are distinguished from retail sales in DWR Table 6-4.</p>										

Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015

<		Wholesale supplier neither distributes nor provides supplemental treatment to recycled water. The supplier will not complete the table below.								
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional)	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level <i>Drop down list</i>	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
Total							0	0	0	0
NOTES: EMWD sells recycled water to wholesale customers RCWD and EVMWD. These volumes are accounted for in the wastewater treated, discharged, and recycled in DWR Table 6-3 for retail.										

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

<input type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:			Eastern Municipal Water District					
Name of Agency Operating the Recycled Water Distribution System:			Eastern Municipal Water District					
Supplemental Water Added in 2015			682 AF					
Source of 2015 Supplemental Water			Raw, Brackish Groundwater from the West San Jacinto Basin					
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment <i>Drop down list</i>	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation		Tertiary	22,979	18,784	17,912	17,784	17,756	17,756
Landscape irrigation (excludes golf courses)		Tertiary	2,464	5,124	6,124	7,124	8,124	9,624
Golf course irrigation		Tertiary	1,572	2,375	2,750	3,125	3,500	3,500
Commercial use		Tertiary	0	300	300	300	300	300
Industrial use		Tertiary	1,067	2,912	3,348	3,784	4,220	4,220
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment		Tertiary	1,177	1,250	1,400	1,400	1,400	1,400
Wetlands or wildlife habitat		Tertiary	3,507	4,500	4,500	4,500	4,500	4,500
Groundwater recharge (IPR)*								
Surface water augmentation (IPR)*								
Direct potable reuse								
Other (Provide General Description)								
Total:			32,766	35,245	36,334	38,017	39,800	41,300

**IPR - Indirect Potable Reuse*

NOTES: 1) Raw, brackish groundwater from the West San Jacinto Basin was used in the recycled water system in 2015 to help meet higher than average agricultural demands for recycled water. This volume was removed from the agricultural beneficial uses volume in the table above. 2) Additional recycled water supply is available to EMWD from 2020 through 2040 that is planned for IPR. This volume is not included in the table as a projected beneficial use as IPR is still a conceptual project. The available supply will be redirected to other demands, including agricultural irrigation and landscape irrigation, if the IPR project is not implemented.

Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area

<input type="checkbox"/>	Recycled water is not directly treated or distributed by the supplier. The supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment <i>Drop down list</i>	2015	2020	2025	2030	2035	2040 <i>(opt)</i>
<i>Add additional rows as needed</i>							
Elsinore Valley Municipal Water District	Tertiary	251	289	400	400	400	400
Rancho California Water District	Tertiary	984	1,367	4,366	4,783	5,200	5,200
Total		1,235	1,656	4,766	5,183	5,600	5,600
NOTES:							

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

<input type="checkbox"/>		Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type		2010 Projection for 2015	2015 Actual Use
Agricultural irrigation		20,000	22,979
Landscape irrigation (excludes golf courses)		5,100	2,464
Golf course irrigation		--	1,572
Commercial use		--	0
Industrial use		5,800	1,067
Geothermal and other energy production		--	--
Seawater intrusion barrier		--	--
Recreational impoundment		--	1,177
Wetlands or wildlife habitat		2,000	3,507
Groundwater recharge (IPR)		--	--
Surface water augmentation (IPR)		--	--
Direct potable reuse		--	--
Other			
Total		32,900	32,766
NOTES:			

Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

<input type="checkbox"/>	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015	2015 actual use
<i>Add additional rows as needed</i>		
Elsinore Valley Municipal Water District	--	251
Rancho California Water District	--	984
Total	0	1,235
NOTES: Projections for wholesale recycled water deliveries were not provided in the 2010 UWMP.		

Table 6-6 Retail: Methods to Expand Future Recycled Water Use

<input type="checkbox"/>	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
<i>Add additional rows as needed</i>			
Mandatory Recycled Water Use Ordinance	The ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available	Ongoing	2,703
Rate Incentives	EMWD prices recycled water below the cost of potable water for both municipal and agricultural use	Ongoing	2,703
Water Supply Assessments	Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted	Ongoing	2,703
Public Education	EMWD has a recycled water public education campaign to promote the benefits of recycled water	Ongoing	2,703
Facilities Financing	EMWD helps arrange or provide financing for the construction of facilities needed to convert potable demands to recycled water	Ongoing	2,703
Total			13,515
<p>NOTES: 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 EMWD's Recycled Water Use Ordinance will play a major role in program expansion.</p>			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs

<input type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down List</i>	Expected Increase in Water Supply to Agency <i>This may be a range</i>
	<i>Drop Down List (y/n)</i>	<i>If Yes, Agency Name</i>				
<i>Add additional rows as needed</i>						
San Jacinto Enhanced Recharge and Recovery Program (ERRP)	Yes	Inland Empire Utilities Agencies, Orange County Water District, San Bernardino Valley Municipal Water District, Western Municipal Water District, DWR	Project to be completed in phases and includes conjunctive use of groundwater recharge and stormwater capture	2020	Multi-Dry Year	45,000 AFY
Moreno Valley Groundwater Development	No		Completion of up to 3 new wells in the Moreno Valley area	2020	Average Year	2,000 AFY
North Perris Groundwater Development	No		Completion of a new well in the North Perris area	2020	Average Year	1,000 AFY
Perris II Desalter	Yes	Army Corps of Engineers	Project includes 4 new wells, 2 of which will be drilled by Army Corps of Engineers	2020	Average Year	3,000-6,000 AFY
Full Utilization of Recycled Water (Potential IPR)	No		Advanced treated recycled water used to recharge the Hemet/San Jacinto Basin	2020-2040	Average Year	18,500 AFY
<p>NOTES: 1) EMWD is planning on meeting future demands with additional imported water. Implementation of future water supply projects or programs would be expected to result in reduced imported water usage with the exception of the ERRP project. The ERRP will include the use of imported water stored for dry weather use.</p> <p>2) Phase 1 of the ERRP is EMWD's contribution to the SARCUPP. In addition to partnering with the SAWPA agencies, coordination will be required with the Hemet-San Jacinto Watermaster.</p> <p>3) While the implementation of IPR is a potential future supply project, the volume is not included in EMWD's supply projections in DWR Table 6-9 for retail.</p>						

Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs						
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description <i>(if needed)</i>	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down list</i>	Expected Increase in Water Supply to Agency
	<i>Drop Down Menu</i>	<i>If Yes, Agency Name</i>				
Add additional rows as needed						
NOTES: EMWD's future supply projects are included in DWR's Retail Table 6-7. Future wholesale demands are expected to be met with imported water.						

Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
<i>Drop down list</i> <i>May use each category multiple times.</i> <i>These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		Actual Volume	Water Quality <i>Drop Down List</i>	Total Right or Safe Yield <i>(optional)</i>
Add additional rows as needed				
Purchased or Imported Water	Treated water purchased from MWD	36,828	Drinking Water	
Purchased or Imported Water	Untreated Water purchased from MWD, treated at EMWD Filtration Plants	18,628	Drinking Water	
Purchased or Imported Water	Raw Water for Agriculture	941	Raw Water	
Groundwater	Potable water pumped from the Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	9,559	Drinking Water	
Groundwater	Potable water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	5,011	Drinking Water	
Groundwater	Brackish water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) used to supplement the recycled water system	682	Raw Water	
Desalinated Water	Desalinated water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	7,288	Drinking Water	
Recycled Water	Includes Storage Pond Incidental Recharge / Evaporation	44,150	Recycled Water	
Total		123,087		0
NOTES: 1) In 2015, brackish groundwater from the West San Jacinto Basin was used to supplement the recycled water system. 2) Desalinated water is brackish groundwater pumped from the West San Jacinto Basin that has been desalinated to provide drinking water quality. The volume in the table reflects the volume after treatment that is available for potable supply. The 2015 volume pumped from the basin before treatment was reported in DWR Table 6-1 as brackish groundwater.				

Table 6-8 Wholesale: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
Drop down list <i>May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		Actual Volume	Water Quality <i>Drop Down List</i>	Total Right or Safe Yield (optional)
Add additional rows as needed				
Purchased or Imported Water	Treated Water purchased from MWD	6,532	Drinking Water	
Purchased or Imported Water	Raw Water purchased from MWD	15,236	Raw Water	
Recycled Water		1,235	Recycled Water	
Total		23,003		0
NOTES:				

Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		2020		2025		2030		2035		2040 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	MWD Treated/ Untreated	73,697		81,597		92,997		104,097		114,597	
Purchased or Imported Water	Soboba Settlement Water	7,500		7,500		7,500		7,500		7,500	
Groundwater	Pumped from the Hemet/San Jacinto Basin	7,303		7,303		7,303		7,303		7,303	
Groundwater	Pumped from the West San Jacinto Basin	5,000		5,000		5,000		5,000		5,000	
Desalinated Water	Desalinated water from the West San Jacinto Basin	7,000		10,100		10,100		10,100		10,100	
Recycled Water	Includes Storage Pond Incidental Recharge / Evaporation	45,245		48,334		50,017		51,800		53,300	
Total		145,745	0	159,834	0	172,917	0	185,800	0	197,800	0

NOTES: 1) 7,500 AFY is the annual amount delivered by MWD to meet the Soboba Settlement Agreement. This water is delivered to EMWD as the member agency of MWD but the groundwater supplies that result from this recharged water are divided between the Soboba Tribe and the participants of the Hemet/San Jacinto Management Plan.

2) Desalinated water is brackish groundwater pumped from the West San Jacinto Basin that has been desalinated to provide drinking water quality.

Table 6-9 Wholesale: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>									
		2020		2025		2030		2035		2040 (opt)	
Drop down list <i>May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	MWD Treated/Untreated	50,500		54,100		57,700		61,200		64,800	
Recycled Water		1,656		4,766		5,183		5,600		5,600	
Total		52,156	0	58,866	0	62,883	0	66,800	0	70,400	0
NOTES:											

Table 7-1 Retail: Basis of Water Year Data

Year Type	Base Year <i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i>	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		<input type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	1922-2004		100%
Single-Dry Year	1977		100%
Multiple-Dry Years 1st Year	1990		100%
Multiple-Dry Years 2nd Year	1991		100%
Multiple-Dry Years 3rd Year	1992		100%
Multiple-Dry Years 4th Year <i>Optional</i>			
Multiple-Dry Years 5th Year <i>Optional</i>			
Multiple-Dry Years 6th Year <i>Optional</i>			
<p>Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.</p>			
<p>NOTES: The MWD IRP simulations show no risk of shortages (allocation) for MWD supply, for the average, single-dry year (1977) and multiple-dry year (1990–1992) conditions.</p>			

Table 7-1 Wholesale: Basis of Water Year Data

Year Type	Base Year <i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i>	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
			<input type="checkbox"/>
Average Year	1922-2004		100%
Single-Dry Year	1977		100%
Multiple-Dry Years 1st Year	1990		100%
Multiple-Dry Years 2nd Year	1991		100%
Multiple-Dry Years 3rd Year	1992		100%
Multiple-Dry Years 4th Year <i>Optional</i>			
Multiple-Dry Years 5th Year <i>Optional</i>			
Multiple-Dry Years 6th Year <i>Optional</i>			

Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

NOTES: The MWD IRP simulations show no risk of shortages (allocation) for MWD supply, for the average, single-dry year (1977) and multiple-dry year (1990–1992) conditions.

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals (autofill from Table 6-9)	145,745	159,834	172,917	185,800	197,800
Demand totals (autofill from Table 4-3)	145,745	159,834	172,917	185,800	197,800
Difference	0	0	0	0	0
NOTES:					

Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals (autofill from Table 6-9)	52,156	58,866	62,883	66,800	70,400
Demand totals (autofill fm Table 4-3)	52,156	58,866	62,883	66,800	70,400
Difference	0	0	0	0	0
NOTES:					

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035	2040 (Opt)
Supply totals	166,300	182,400	197,400	212,000	225,700
Demand totals	166,300	182,400	197,400	212,000	225,700
Difference	0	0	0	0	0

NOTES:

Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035	2040 (Opt)
Supply totals	58,500	66,200	70,700	75,200	79,300
Demand totals	58,500	66,200	70,700	75,200	79,300
Difference	0	0	0	0	0
NOTES:					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	166,300	182,400	197,400	212,000	225,700
	Demand totals	166,300	182,400	197,400	212,000	225,700
	Difference	0	0	0	0	0
Second year	Supply totals	142,500	155,400	167,400	179,000	190,100
	Demand totals	142,500	155,400	167,400	179,000	190,100
	Difference	0	0	0	0	0
Third year	Supply totals	149,500	162,700	175,100	186,900	198,600
	Demand totals	149,500	162,700	175,100	186,900	198,600
	Difference	0	0	0	0	0
Fourth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

NOTES:

Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	58,500	66,200	70,700	75,200	79,300
	Demand totals	58,500	66,200	70,700	75,200	79,300
	Difference	0	0	0	0	0
Second year	Supply totals	48,500	54,700	58,200	61,700	64,900
	Demand totals	48,500	54,700	58,200	61,700	64,900
	Difference	0	0	0	0	0
Third year	Supply totals	52,000	57,400	61,100	64,600	68,000
	Demand totals	52,000	57,400	61,100	64,600	68,000
	Difference	0	0	0	0	0
Fourth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

NOTES:

**Table 8-1 Retail
Stages of Water Shortage Contingency Plan**

Stage	Complete Both	
	Percent Supply Reduction ¹ <i>Numerical value as a percent</i>	Water Supply Condition <i>(Narrative description)</i>
<i>Add additional rows as needed</i>		
1	up to 10%	Supply watch. Customers will be asked to reduce up to 10% of demand voluntarily.
2	up to 25%	Supply alert. Customers will be asked to reduce 25% of demand voluntarily.
3	up to 25%	Mandatory Waste Reduction. At this stage efforts will be focused on a mandatory reduction of excessive water use.
4	up to 50%	Mandatory Outdoor Reduction. At this stage efforts will be focused on mandatory reduction of outdoor water use.
5	50% or greater	Mandatory Indoor Reduction. At this stage efforts will be focused on mandatory reduction of indoor water use. This stage would only be implemented in response to a catastrophic loss of supplies requiring a 50 percent or more reduction in demand.
¹ One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES: EMWD has built flexibility into its WSCP. Stages are not directly tied to water supply conditions. The WSCP can be implemented as needed to meet a reduction in demand or to respond to other conditions. In 2015 and 2016, EMWD implemented Stage 4 of its WSCP to meet the requirements of the State Water Resource Control Board Emergency Regulation. The required reduction did not reflect EMWD's supply reliability..		

Table 8-1 Wholesale Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Supply Reduction ¹	Water Supply Condition (Narrative description)
Add additional rows as needed		
1	5%	MWD regional shortage level 1
2	10%	MWD regional shortage level 2
3	15%	MWD regional shortage level 3
4	20%	MWD regional shortage level 4
5	25%	MWD regional shortage level 5
6	30%	MWD regional shortage level 6
7	35%	MWD regional shortage level 7
8	40%	MWD regional shortage level 8
9	45%	MWD regional shortage level 9
10	50%	MWD regional shortage level 10
¹ One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES: Percentages represent MWD's regional shortage level and not retail shortages. EMWD will pass through MWD's WSAP to its wholesale customers.		

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses

Stage	Restrictions and Prohibitions on End Users <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	Additional Explanation or Reference <i>(optional)</i>	Penalty, Charge, or Other Enforcement? <i>Drop Down List</i>
<i>Add additional rows as needed</i>			
1	Other - Prohibit use of potable water for washing hard surfaces	Except for health or sanitary reasons	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Repair leaks within 48 hours of occurrence	Yes
1	Landscape - Limit landscape irrigation to specific times	Only between 9:00 p.m. and 6:00 a.m. except when: -manually watering; -establishing new landscape; -temperatures are predicted to fall below freezing; -it's for very short periods of time to adjust or repair an irrigation system.	Yes
1	Landscape - Prohibit certain types of landscape irrigation	Unattended irrigation systems using potable water are prohibited unless they are limited to no more than fifteen (15) minutes watering per day, per station. This limitation can be extended for: -Very low flow drip irrigation systems when no emitter produces more than two (2) gallons of water per hour. -Weather based controllers or stream rotor sprinklers that meet a 70% efficiency.	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Avoid over watering or watering of hardscape and the resulting runoff	Yes
1	Other water feature or swimming pool restriction	Decorative fountains must be equipped with a recycling system	Yes
1	Other	Allowing water to run while washing vehicles is prohibited	Yes
1	Other	Install new landscaping with low-water demand trees and plants. New turf shall only be installed for functional purposes.	Yes

1	Landscape - Other landscape restriction or prohibition	Watering during rain, or within 48 hours after measurable rain, is prohibited	Yes
2	Landscape - Other landscape restriction or prohibition	Reduce watering or irrigating of lawn, landscape or other vegetated areas with sprinklers by one day a week	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system repaired within seventy-two hours	Yes
2	Other water feature or swimming pool restriction	Refrain from filling or re-filling of ornamental lakes or ponds	Yes
2	Other	Refrain from using potable water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not	Yes
3a	Other	No variances or adjustments will be allowed for filling swimming pools, establishing new landscapes or leaks that are not repaired within 48 hours	Yes
3b	Other	Tier 3 (Excessive Use) water budget decreased by 50 percent	Yes
3c	Other	Tier 3 (Excessive Use) water budget decreased by 100 percent	Yes
4	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawn, landscape, or other vegetated areas with sprinklers should be limited to the following schedule: -June through August: A maximum of two days a week -September through May: A maximum of one day a week	Yes
4a	Other	Tier 2 (Outdoor Use) water budget decreased by 10 percent	Yes
4b	Other	Tier 2 (Outdoor Use) water budget decreased by up to 50 percent	Yes

4c	Other	Tier 2 (Outdoor Use) water budget decreased by up to 100 percent	Yes
5a	Other	Tier 1 (Indoor Use) water budget decreased by 10 percent	Yes
5b	Other	Tier 1 (Indoor Use) water budget decreased by 30 percent	Yes
5c	Other	Tier 1 (Indoor Use) water budget decreased by 50 percent	Yes
5	Other	CII, Agricultural, and any other customer without a water budget will be given a water budget based on historical water use, and allocations will be reduced according to the percentages listed for stages 5a-5c (up to 50 percent)	Yes
NOTES:			

Table 8-3 Retail Only:

Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	Additional Explanation or Reference <i>(optional)</i>
<i>Add additional rows as needed</i>		
1-5	Expand Public Information Campaign	EMWD will continue to implement its conservation program and may supplement programs during WSCP implementation.
3	Other	EMWD has four tiers in its allocation based rate structure. Stage 3 progressively reduces the tier 3 allocation. Any water used over the allocations for tiers 1-3 is charged at the tier 4 rate ¹ .
4	Other	EMWD has four tiers in its allocation based rate structure. Stage four eliminated the tier 3 allocation and progressively reduces the tier 2 allocation. Any water used over the allocations for tiers 1-2 is charged at the tier 4 rate ¹ .
5	Other	EMWD has four tiers in its allocation based rate structure. Stage 5 eliminated the tier 3 and 4 allocations and progressively reduces the tier 1 allocation. Any water used over the allocations for tiers 1 is charged at the tier 4 rate ¹ .
NOTES: The current tier 4 rate is \$11.16 per hundred cubic feet		

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	128,500	131,700	135,000
NOTES:			

Table 8-4 Wholesale: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	25,900	26,500	27,200
NOTES:			

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
City of Beaumont	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Menifee	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Moreno Valley	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Murrieta	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Riverside	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Temecula	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
Riverside County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Table 10-1 Wholesale: Notification to Cities and Counties (select one)

<input type="checkbox"/>	Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642. Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.	
	Provide the page or location of this list in the UWMP.	
<input checked="" type="checkbox"/>	Supplier has notified 10 or fewer cities or counties. Complete the table below.	
City Name	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
City of Perris	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of Hemet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
City of San Jacinto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lake Hemet Municipal Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Nuevo Water Company	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rancho California Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Western Municipal Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Elsinore Valley Municipal Water District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metropolitan Water District of Southern California	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
Riverside County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NOTES:		

Appendix C - SBx7-7 Verification Form

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SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	125,284	Acre Feet
	2008 total volume of delivered recycled water	28,100	Acre Feet
	2008 recycled water as a percent of total deliveries	22.43%	Percent
	Number of years in baseline period ^{1, 2}	10	Years
	Year beginning baseline period range	1999	
	Year ending baseline period range ³	2008	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range ⁴	2007	

¹ If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. ² The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.

³ The ending year must be between December 31, 2004 and December 31, 2010.

⁴ The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 0: Units of Measure Used in UWMP*

(select one from the drop down list)

Acre Feet

**The unit of measure must be consistent with Table 2-3*

NOTES:

Method Used to Determine Population (may check more than one)	
<input type="checkbox"/>	1. Department of Finance (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
<input checked="" type="checkbox"/>	2. Persons-per-Connection Method
<input checked="" type="checkbox"/>	3. DWR Population Tool
<input checked="" type="checkbox"/>	4. Other DWR recommends pre-review
NOTES: EMWD used an alternate population methodology based on U.S. Census data and GIS very similar to DWR's Population Tool. This methodology was pre-reviewed by DWR.	

SB X7-7 Table 3: Service Area Population

Year		Population
10 to 15 Year Baseline Population		
Year 1	1999	292,123
Year 2	2000	303,678
Year 3	2001	317,457
Year 4	2002	357,783
Year 5	2003	364,893
Year 6	2004	389,897
Year 7	2005	430,314
Year 8	2006	468,467
Year 9	2007	486,901
Year 10	2008	500,589
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	364,893
Year 2	2004	389,897
Year 3	2005	430,314
Year 4	2006	468,467
Year 5	2007	486,901
2015 Compliance Year Population		
2015		546,146
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year <i>Fm SB X7-7 Table 3</i>		Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1999	83,252	13,862		-		-	69,390
Year 2	2000	89,852	17,847		-		-	72,005
Year 3	2001	86,835	16,776		-		-	70,059
Year 4	2002	97,278	15,995		-		-	81,283
Year 5	2003	97,598	11,309		-		-	86,289
Year 6	2004	86,983	7,006		-		-	79,977
Year 7	2005	97,723	3,046		-		-	94,677
Year 8	2006	105,496	4,665		-		-	100,831
Year 9	2007	112,060	7,682		-		-	104,378
Year 10	2008	103,694	6,510		-		-	97,184
<i>Year 11</i>	0	-			-		-	-
<i>Year 12</i>	0	-			-		-	-
<i>Year 13</i>	0	-			-		-	-
<i>Year 14</i>	0	-			-		-	-
<i>Year 15</i>	0	-			-		-	-
10 - 15 year baseline average gross water use								85,607
5 Year Baseline - Gross Water Use								
Year 1	2003	97,598	11,309		-		-	86,289
Year 2	2004	86,983	7,006		-		-	79,977
Year 3	2005	97,723	3,046		-		-	94,677
Year 4	2006	105,486	4,665		-		-	100,821
Year 5	2007	112,060	7,682		-		-	104,378
5 year baseline average gross water use								93,228
2015 Compliance Year - Gross Water Use								
2015		81,453	2,516		-		-	78,937

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	Potable Wells
-----------------------	---------------

This water source is:

<input checked="" type="checkbox"/>	The supplier's own water source
<input type="checkbox"/>	A purchased or imported source

Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional (+/-)</i>	Corrected Volume Entering Distribution System
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10 to 15 Year Baseline - Water into Distribution System

Year 1	1999	20,280		20,280
Year 2	2000	21,287		21,287
Year 3	2001	18,536		18,536
Year 4	2002	18,861		18,861
Year 5	2003	17,547		17,547
Year 6	2004	16,564		16,564
Year 7	2005	18,064		18,064
Year 8	2006	19,644		19,644
Year 9	2007	19,489		19,489
Year 10	2008	20,043		20,043
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-

5 Year Baseline - Water into Distribution System

Year 1	2003	17,547		17,547
Year 2	2004	16,564		16,564
Year 3	2005	18,064		18,064
Year 4	2006	19,644		19,644
Year 5	2007	19,489		19,489

2015 Compliance Year - Water into Distribution System

2015	14,570		14,570
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** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution

Name of Source	Desalters
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This water source is:


The supplier's own water source



A purchased or imported source

Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
--	--	--	---

10 to 15 Year Baseline - Water into Distribution System

Year 1	1,999	0	0
Year 2	2,000	0	0
Year 3	2,001	0	0
Year 4	2,002	4	4
Year 5	2,003	999	999
Year 6	2,004	1440	1,440
Year 7	2,005	855	855
Year 8	2,006	4802	4,802
Year 9	2,007	4792	4,792
Year 10	2,008	2973	2,973
Year 11	-		0
Year 12	-		0
Year 13	-		0
Year 14	-		0
Year 15	-		0

5 Year Baseline - Water into Distribution System

Year 1	2,003	999	999
Year 2	2,004	1440	1,440
Year 3	2,005	855	855
Year 4	2,006	4802	4,802
Year 5	2,007	4792	4,792

2015 Compliance Year - Water into Distribution System

2015	7,288		7,288
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** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution

Name of Source		Treated Imported Water		
This water source is:				
<input type="checkbox"/>	The supplier's own water source			
<input checked="" type="checkbox"/>	A purchased or imported source			
Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System	
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,999	62972		62,972
Year 2	2,000	68565		68,565
Year 3	2,001	68299		68,299
Year 4	2,002	77349		77,349
Year 5	2,003	74551		74,551
Year 6	2,004	60835		60,835
Year 7	2,005	73060		73,060
Year 8	2,006	72554		72,554
Year 9	2,007	70467		70,467
Year 10	2,008	63731		63,731
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,003	74551		74,551
Year 2	2,004	60835		60,835
Year 3	2,005	73060		73,060
Year 4	2,006	72544		72,544
Year 5	2,007	70467		70,467
2015 Compliance Year - Water into Distribution System				
2015	39,344			39,344
* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document				
NOTES:				

SB X7-7 Table 4-A: Volume Entering the Distribution

Name of Source	Raw Imported Water
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This water source is:

<input type="checkbox"/>	The supplier's own water source
--------------------------	---------------------------------

<input checked="" type="checkbox"/>	A purchased or imported source
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Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
--	--	--	---

10 to 15 Year Baseline - Water into Distribution System

Year 1	1,999	0	0
Year 2	2,000	0	0
Year 3	2,001	0	0
Year 4	2,002	1064	1,064
Year 5	2,003	760	760
Year 6	2,004	233	233
Year 7	2,005	108	108
Year 8	2,006	91	91
Year 9	2,007	41	41
Year 10	2,008	353	353
Year 11	-		0
Year 12	-		0
Year 13	-		0
Year 14	-		0
Year 15	-		0

5 Year Baseline - Water into Distribution System

Year 1	2,003	760	760
Year 2	2,004	233	233
Year 3	2,005	108	108
Year 4	2,006	91	91
Year 5	2,007	41	41

2015 Compliance Year - Water into Distribution System

2015	941		941
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** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution

Name of Source	EMWD Filtration Plants
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This water source is:

☐

The supplier's own water source

☒

A purchased or imported source

Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
--	--	--	---

10 to 15 Year Baseline - Water into Distribution System

Year 1	1,999	0	0
Year 2	2,000	0	0
Year 3	2,001	0	0
Year 4	2,002	0	0
Year 5	2,003	3741	3,741
Year 6	2,004	7911	7,911
Year 7	2,005	5636	5,636
Year 8	2,006	8405	8,405
Year 9	2,007	17271	17,271
Year 10	2,008	16594	16,594
Year 11	-		0
Year 12	-		0
Year 13	-		0
Year 14	-		0
Year 15	-		0

5 Year Baseline - Water into Distribution System

Year 1	2,003	3741	3,741
Year 2	2,004	7911	7,911
Year 3	2,005	5636	5,636
Year 4	2,006	8405	8,405
Year 5	2,007	17271	17,271

2015 Compliance Year - Water into Distribution System

2015	18,628		18,628
-------------	--------	--	--------

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)

Baseline Year <i>Fm SB X7-7 Table 3</i>		Service Area Population <i>Fm SB X7-7 Table 3</i>	Annual Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1999	292,123	69,390	212
Year 2	2000	303,678	72,005	212
Year 3	2001	317,457	70,059	197
Year 4	2002	357,783	81,283	203
Year 5	2003	364,893	86,289	211
Year 6	2004	389,897	79,977	183
Year 7	2005	430,314	94,677	196
Year 8	2006	468,467	100,831	192
Year 9	2007	486,901	104,378	191
Year 10	2008	500,589	97,184	173
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				197
5 Year Baseline GPCD				
Baseline Year <i>Fm SB X7-7 Table 3</i>		Service Area Population <i>Fm SB X7-7 Table 3</i>	Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use
Year 1	2003	364,893	86,289	211
Year 2	2004	389,897	79,977	183
Year 3	2005	430,314	94,677	196
Year 4	2006	468,467	100,821	192
Year 5	2007	486,901	104,378	191
5 Year Average Baseline GPCD				195
2015 Compliance Year GPCD				
2015		546,146	78,937	129
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day*Summary From Table SB X7-7 Table 5*

10-15 Year Baseline GPCD	197
5 Year Baseline GPCD	195
2015 Compliance Year GPCD	129

NOTES:

SB X7-7 Table 7: 2020 Target Method*Select Only One*

Target Method		Supporting Documentation
<input type="checkbox"/>	Method 1	SB X7-7 Table 7A
<input checked="" type="checkbox"/>	Method 2	SB X7-7 Tables 7B, 7C, and 7D <i>Contact DWR for these tables</i>
<input type="checkbox"/>	Method 3	SB X7-7 Table 7-E
<input type="checkbox"/>	Method 4	Method 4 Calculator

NOTES:

**Water Suppliers using Target Method 2 shall complete the
Parcels Table, SB X7-7 Tables 7B, 7C, and 7D, as found in this worksheet.**

Landscape

These tables will be submitted to DWR as an Excel attachment in the WUEdata tool.

The

data from these tables will not be entered into WUE data tables.

If the water supplier's service area spans more than one ETo Zone, the supplier will:

1.

use multiple versions of the Landscape Parcel Table for each ETo zone that they serve.

2. Use

multiple versions of SB X7-7 Table 7B for each ETo zone that they serve.

3. Add additional

rows to Table 7D

LANDSCAPE PARCELS

A narrative describing the method for estimating landscape area must be provided. These estimations must be made in accordance with Methodology 6 Section "Measure Landscape Area".
Provide location of narrative in cell to the right.

Section 5.6

Enter ETo^{1,2} for Service Area (inches/year)

58.82

Pre-2010 Landscape (ETAF .8)

Category by Parcel Size in Sq Ft	# of Parcels	Estimated % Landscape Area <i>fm sampling</i>	Landscape Area (In Acres)
0 - 4,000 sqft	4,907		99.08
4,000 - 8,000 sqft	76,345		4,071.84
8,000 - 12,000 sqft	26,633		2,278.10
12,000 - 16,000 sqft	4,009		528.65
16,000 - 20,000 sqft	2,431		348.87
20,000 - 24,000 sqft	1,790		341.83
Greater than 24,000 sqft	8,273		2,617.51
Unknown	6,091		5,273.61
TOTAL Pre 2010 Landscapes	130,479		15,559

Post-2010 Landscape (ETAF .7)

Category by Parcel Size in Sq Ft	# of Parcels	Estimated % Landscape Area <i>fm sampling</i>	Landscape Area (In Acres)
0 - 4,000 sqft	4		0.13
4,000 - 8,000 sqft	307		18.39
8,000 - 12,000 sqft	159		11.67
12,000 - 16,000 sqft	15		1.97
16,000 - 20,000 sqft	5		0.34
20,000 - 24,000 sqft	3		0.90
Greater than 24,000 sqft	-		-
Unknown	7,583		965.76
TOTAL Post 2010 Landscapes	8,076		999

Special Landscape Area (SLA) (ETAF 0.55)			
Category by Parcel Size in Sq Ft	# of Parcels	Estimated % Landscape Area <i>fm sampling</i>	Landscape Area (In Acres)
0 - 4,000 sqft			
4,000 - 8,000 sqft			
8,000 - 12,000 sqft			
12,000 - 16,000 sqft			
16,000 - 20,000 sqft			
20,000 - 24,000 sqft			
Greater than 24,000 sqft			
Unknown			134.00
TOTAL SLA Landscapes	-		134
Special Landscape Area (SLA) (ETAF 0.8)			
Category by Parcel Size in Sq Ft	# of Parcels	Estimated % Landscape Area <i>fm sampling</i>	Landscape Area (In Acres)
0 - 4,000 sqft			
4,000 - 8,000 sqft			
8,000 - 12,000 sqft			
12,000 - 16,000 sqft			
16,000 - 20,000 sqft			
20,000 - 24,000 sqft			
Greater than 24,000 sqft			
Unknown			1,500.00
TOTAL SLA Landscapes	-		1,500
Special Landscape Area (SLA) (ETAF 1.0)			
Category by Parcel Size in Sq Ft	# of Parcels	Estimated % Landscape Area <i>fm sampling</i>	Landscape Area (In Acres)
0 - 4,000 sqft			
4,000 - 8,000 sqft			
8,000 - 12,000 sqft			
12,000 - 16,000 sqft			
16,000 - 20,000 sqft			
20,000 - 24,000 sqft			
Greater than 24,000 sqft			
Unknown			384.47
TOTAL SLA Landscapes	-		384
TOTAL LANDSCAPE AREA (In Acres)			18,577
¹ If the water supplier's service area spans more than one ETo Zone, the supplier will use multiple versions of the Landscape Parcel Table and SB X7-7 Table 7B for each ETo zone that they serve.			
² Methods for estimating historical ETo (reference evapotranspiration) are described in the Methodologies document, Methodology 6, in the section "Estimate Reference Evapotranspiration".			
NOTES			

SB X7-7 Table 7-B: Target Method 2**Target Landscape Water Use**

Select Unit of Measure from drop down		Acre Feet
ETo ¹ for Service Area (inches/year) from Landscape Parcels Table		58.8
Landscape Parcels (from Landscape Parcels Table)	Acres	Water Use
Acres of landscape installed pre-2010 ² (ETAF 0.8) ³	15,559	61,014
Acres of landscape installed post-2010 ² (ETAF 0.7) ³	999	3,428
Acres of Special Landscape Area ² (ETAF 0.55) ³	134	361
Acres of Special Landscape Area ² (ETAF 0.8) ³	1,500	5,882
Acres of Special Landscape Area ² (ETAF 1.0) ³	384	1,885
Target Landscape Water Use for 2015 in		Acre Feet 72,570

¹ If the water supplier's service area spans more than one ETo Zone, the supplier will use multiple versions of the Landscape Parcel Table and SB X7-7 Table 7B for each ETo zone that they serve.

² The number of acres is taken from the Landscape Parcels Table.

³ ETAF - Evapotranspiration Adjustment Factor. Refer to the Model Water Efficient Landscape Ordinance.

NOTES

SB X7-7 Table 7-C: Target Method 2
Target CII Water Use

Baseline Year <i>Fm SB X7-7 Table 3</i>	CII Water Use*	Process Water Exclusion (Optional) <i>Fm SB X7-7 Table (s) 4-D</i>	CII Water Use Minus Process Water Exclusion	Population <i>Fm SB X7-7 Table 3</i>	CII GPCD
	Select Unit of Measure from drop down Must be same as Table 7B				
	Acre Feet				
1999	6,740		6,740	292,123	21
2000	7,170		7,170	303,678	21
2001	7,120		7,120	317,457	20
2002	7,280		7,280	357,783	18
2003	7,230		7,230	364,893	18
2004	7,850		7,850	389,897	18
2005	7,280		7,280	430,314	15
2006	8,240		8,240	468,467	16
2007	8,370		8,370	486,901	15
2008	8,190		8,190	500,589	15
			0		
			0		
			0		
			0		
			0		
Average Annual 10 to 15 Year Baseline CII Water Use (GPCD)					18
10% Reduction					2
2020 Target CII Water Use					16
*CII water use for each year of the baseline period must be provided.					
NOTES					

SB X7-7 Table 7-D: Target Method 2 Summary

617,100		2020 Population
Sector	Volume	GPCD
	Acre Feet	
Target Indoor Residential Water Use	38,018	55
Target Landscape Water Use* <i>From SB X7-7 Table 7-B</i>	72,570	105
Target CII Water Use <i>From SB X7-7 Table 7-C</i>	10,967	16
2020 Target	121,555	176
*Additional rows may be added for Target Landscape Water Use if the service area spans more than one Eto Zone.		
NOTES:		

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD From SB X7-7 Table 5	Maximum 2020 Target ¹	Calculated 2020 Target ²	Confirmed 2020 Target
195	185	176	176

¹ Maximum 2020 Target is 95% of the 5 Year Baseline GPCD
² 2020
 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and
 corresponding tables for agency's calculated target.

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD

Confirmed 2020 Target <i>Fm SB X7-7 Table 7-F</i>	10-15 year Baseline GPCD <i>Fm SB X7-7 Table 5</i>	2015 Interim Target GPCD
176	197	187

NOTES:

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments <i>(in GPCD)</i>					2015 GPCD <i>(Adjusted if applicable)</i>	Did Supplier Achieve Targeted Reduction for 2015?
		Enter "0" if Adjustment Not Used			TOTAL Adjustments	Adjusted 2015 GPCD		
		Extraordinary Events	Weather Normalization	Economic Adjustment				
129	187	-	<i>From Methodology 8 (Optional)</i>	-	-	129	129	YES

NOTES:

Appendix D - AWWA Water Loss Audit

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AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	<input type="text"/>		
Email Address:	<input type="text"/>		
Telephone Ext.:	<input type="text"/>	<input type="text"/>	
Name of City / Utility:	<input type="text" value="Eastern Municipal Water District"/>		
City/Town/Municipality:	<input type="text" value="Perris"/>		
State / Province:	<input type="text" value="California (CA)"/>		
Country:	<input type="text" value="USA"/>		
Year:	<input type="text" value="2014-2015"/>	Financial Year	
Start Date:	<input type="text" value="07/2014"/>	Enter MM/YYYY numeric format	
End Date:	<input type="text" value="06/2015"/>	Enter MM/YYYY numeric format	
Audit Preparation Date:	<input type="text"/>		
Volume Reporting Units:	<input type="text" value="Acre-feet"/>		
PWSID / Other ID:	<input type="text"/>		

The following guidance will help you complete the Audit

All audit data are entered on the [Reporting Worksheet](#)

<input type="text"/>	Value can be entered by user
<input type="text"/>	Value calculated based on input data
<input type="text"/>	These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: ☐ 0.25% ☒ Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions

The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet

Enter the required data on this worksheet to calculate the water balance and data grading

Comments

Enter comments to explain how values were calculated or to document data sources

Performance Indicators

Review the performance indicators to evaluate the results of the audit

Water Balance

The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard

A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix

Presents the possible grading options for each input component of the audit

Service Connection Diagram

Diagrams depicting possible customer service connection line configurations

Definitions

Use this sheet to understand the terms used in the audit process

Loss Control Planning

Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits

Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements

Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
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?	Click to access definition
+	Click to add a comment

Water Audit Report for: **Eastern Municipal Water District**
Reporting Year: **2014-2015** **7/2014 - 6/2015**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----- Enter grading in column 'E' and 'J' ----->

WATER SUPPLIED

Volume from own sources:	+	?	7	41,147.810	acre-ft/yr
Water imported:	+	?	8	52,839.890	acre-ft/yr
Water exported:	+	?	7	10,920.415	acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	Value:	
+	?	
+	?	
+	?	

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **83,067.285** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+	?	9	78,855.106	acre-ft/yr
Billed unmetered:	+	?	10	0.000	acre-ft/yr
Unbilled metered:	+	?	10	0.000	acre-ft/yr
Unbilled unmetered:	+	?	7	29.630	acre-ft/yr

Click here: ?
for help using option
buttons below

Pcnt:	Value:	
		29.630

Use buttons to select
percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: **78,884.736** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

4,182.549 acre-ft/yr

Apparent Losses

Unauthorized consumption: **207.668** acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+	?	8	477.900	acre-ft/yr
Systematic data handling errors:	+	?	5	0.000	acre-ft/yr

Pcnt:	Value:	
0.25%		

		477.900
		0.000

Apparent Losses: **685.568** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **3,496.981** acre-ft/yr

WATER LOSSES: **4,182.549** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **4,212.179** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	9	2,461.0	miles
Number of <u>active AND inactive</u> service connections:	+	?	8	157,424	
Service connection density:	?			64	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: **71.5**

(length of service line, beyond the property boundary,
that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: **5** **71.5** psi

COST DATA

Total annual cost of operating water system:	+	?	9	\$121,140,746	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	\$3.29	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	9	\$1,435.99	\$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

Retail costs are less than (or equal to) production costs; please review and correct if necessary

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 78 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Water imported

3: Unauthorized consumption



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

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*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 78 out of 100 ***

System Attributes:

Apparent Losses:	685.568	acre-ft/yr	
+	Real Losses:	3,496.981	acre-ft/yr
=	Water Losses:	4,182.549	acre-ft/yr

? Unavoidable Annual Real Losses (UARL): 2,957.54 acre-ft/yr

Annual cost of Apparent Losses: \$982,504

Annual cost of Real Losses: \$5,021,629

Valued at **Variable Production Cost**[Return to Reporting Worksheet to change this assumption](#)

Performance Indicators:

Financial:

Non-revenue water as percent by volume of Water Supplied: 5.1%

Non-revenue water as percent by cost of operating system: 5.0% Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: 3.89 gallons/connection/day

Real Losses per service connection per day: 19.83 gallons/connection/day

Real Losses per length of main per day*: N/A

Real Losses per service connection per day per psi pressure: 0.28 gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): 3,496.98 acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: 1.18

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software: User Comments

WAS v5.0

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	
Audit Item	Comment
Volume from own sources:	
Vol. from own sources: Master meter error adjustment:	
Water imported:	
Water imported: master meter error adjustment:	
Water exported:	
Water exported: master meter error adjustment:	
Billed metered:	
Billed unmetered:	
Unbilled metered:	

Audit Item	Comment
Unbilled unmetered:	
Unauthorized consumption:	
Customer metering inaccuracies:	
Systematic data handling errors:	
Length of mains:	
Number of active AND inactive service connections:	
Average length of customer service line:	
Average operating pressure:	
Total annual cost of operating water system:	
Customer retail unit cost (applied to Apparent Losses):	
Variable production cost (applied to Real Losses):	



AWWA Free Water Audit Software: Water Balance

WAS v5.0

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Own Sources (Adjusted for known errors) 41,147.810	Water Exported 10,920.415	Billed Water Exported				
	Water Supplied 83,067.285	Authorized Consumption 78,884.736	Billed Authorized Consumption 78,855.106	Billed Metered Consumption (water exported is removed) 78,855.106	Revenue Water 78,855.106	
				Billed Unmetered Consumption 0.000		
			Unbilled Authorized Consumption 29.630	Unbilled Metered Consumption 0.000	Non-Revenue Water (NRW) 4,212.179	
				Unbilled Unmetered Consumption 29.630		
		Water Losses 4,182.549	Apparent Losses 685.568	Unauthorized Consumption 207.668		
				Customer Metering Inaccuracies 477.900		
				Systematic Data Handling Errors 0.000		
		Water Imported 52,839.890		Real Losses 3,496.981	Leakage on Transmission and/or Distribution Mains Not broken down	
	Leakage and Overflows at Utility's Storage Tanks Not broken down					
Leakage on Service Connections Not broken down						



AWWA Free Water Audit Software: Dashboard

WAS v5.0

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The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

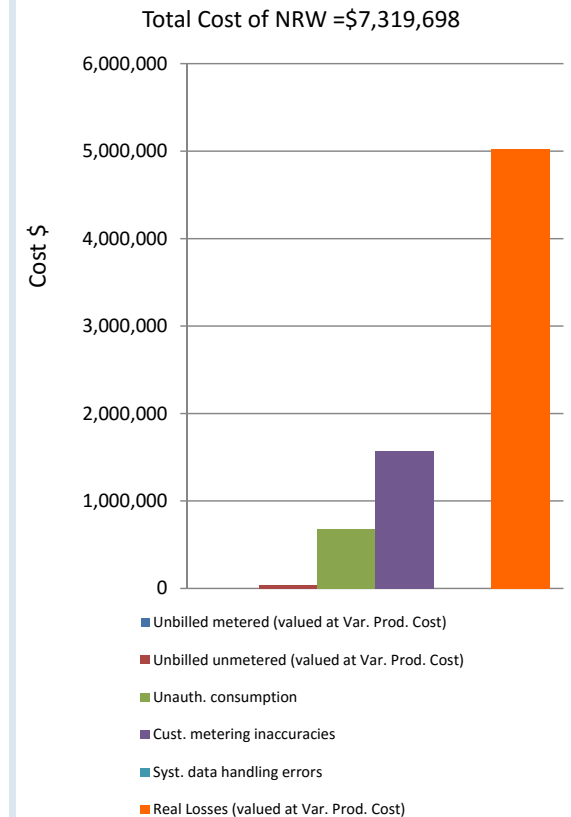
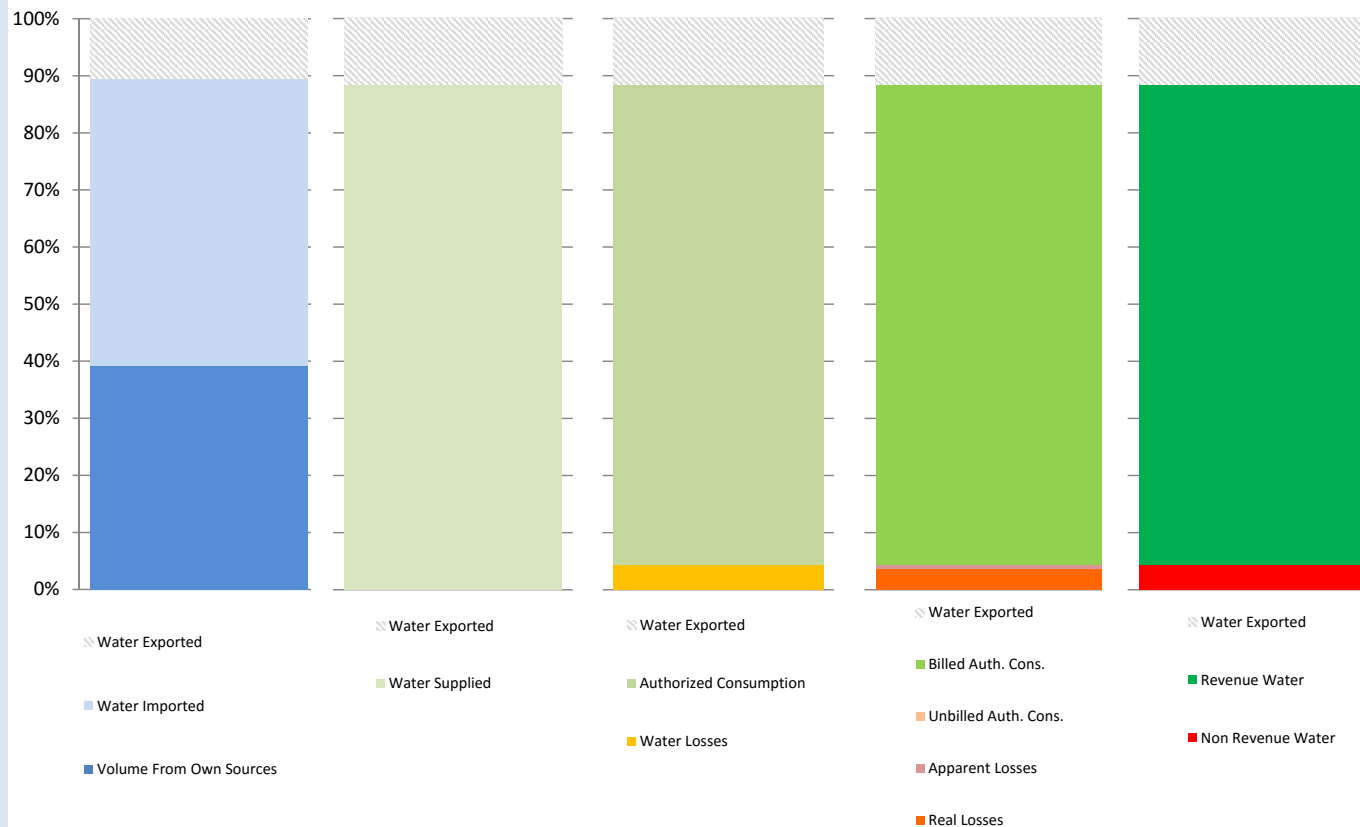
Water Audit Report for: **Eastern Municipal Water District**

Reporting Year: **2014-2015** **7/2014 - 6/2015**

Data Validity Score: **78**

☐ Show me the VOLUME of Non-Revenue Water

☒ Show me the COST of Non-Revenue Water





AWWA Free Water Audit Software: Grading Matrix

WAS 5.0

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The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
WATER SUPPLIED											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered; other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, <u>at least 90% of the source flow is derived from metered sources</u> . Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		<u>to qualify for 2:</u> Organize and launch efforts to collect data for determining volume from own sources	<u>to qualify for 4:</u> Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		<u>to qualify for 8:</u> Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system; tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensure minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	<u>to qualify for 4:</u> Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		<u>to qualify for 8:</u> Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		<u>to qualify for 10:</u> Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered; other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component: (Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)		<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4:</u> Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetered, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Importer. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4:</u> Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		<u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8:</u> Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10:</u> Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility, at least every five years.		<u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component: (Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4:</u> Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6:</u> Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8:</u> Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10:</u> Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined. Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis, with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component.		<p><u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.</p>	<p><u>to qualify for 4:</u> Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.</p>		<p><u>to qualify for 6:</u> Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.</p>		<p><u>to qualify for 8:</u> Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.</p>		<p><u>to qualify for 10:</u> Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities, at least every five years.</p>		<p><u>to maintain 10:</u> Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.</p>
AUTHORIZED CONSUMPTION											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted, with less than 50% meter read success rate, remaining accounts consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	<p><u>to qualify for 2:</u> Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.</p>	<p><u>to qualify for 4:</u> Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.</p>		<p><u>to qualify for 6:</u> Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.</p>		<p><u>to qualify for 8:</u> Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.</p>		<p><u>to qualify for 10:</u> Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.</p>		<p><u>to maintain 10:</u> Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.</p>
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter; i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		to qualify for 2: Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.	to qualify for 4: Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.		to qualify for 6: Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significant reduce the number of unmetered accounts		to qualify for 8: Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.		to qualify for 10: Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.		to maintain 10: Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist; and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.	Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.	Conditions between 2 and 4	Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.	Conditions between 4 and 6	Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.	Conditions between 6 and 8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Conditions between 8 and 10	Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		to qualify for 2: Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.	to qualify for 4: Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.		to qualify for 6: Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.		to qualify for 8: Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.		to qualify for 10: Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.		to maintain 10: Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.
Unbilled unmetered:		Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.	Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.	Conditions between 2 and 4	Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).	Default value of 1.25% of system input volume is employed	Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.	Conditions between 6 and 8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.	Conditions between 8 and 10	Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		to qualify for 5: Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 2: Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).	to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 4: Evaluate the documentation of events that have been observed. Meet with user groups (ex: fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).		to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.	to qualify for 6 or greater: Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.		to qualify for 10: Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.		to maintain 10: Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.
APPARENT LOSSES											

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
SYSTEM DATA											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographical Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	Note: The number of Service Connections does not include fire hydrant leads/lines connecting the hydrant to the water main	to qualify for 2: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	to qualify for 4: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		to qualify for 6: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		to qualify for 8: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		to qualify for 10: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		to maintain 10: Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water	Gratings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gratings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility, and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Worksheet asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet. b) Meters exist inside customer buildings, or properties are unnumbered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2:</u> Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4:</u> Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6:</u> Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8:</u> Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10:</u> Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10:</u> Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system, occasional open boundary valves are discovered that breach pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breach pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		<u>to qualify for 2:</u> Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	<u>to qualify for 4:</u> Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		<u>to qualify for 6:</u> Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		<u>to qualify for 8:</u> Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		<u>to qualify for 10:</u> Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		<u>to maintain 10:</u> Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for real-time pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
COST DATA											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2:</u> Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8:</u> Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2:</u> Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4:</u> Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6:</u> Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8:</u> Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10:</u> Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10:</u> Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis, or: 2) Water supply is entirely purchased as bulk imported water, and unit purchase cost serves as the variable production cost.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2:</u> Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4:</u> Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6:</u> Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8:</u> Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgeable third-party at least once every three years.		<u>to qualify for 10:</u> Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10:</u> Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively



AWWA Free Water Audit Software: Customer Service Line Diagrams

WAS v5.0

American Water Works Association.
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Average Length of Customer Service Line

The three figures shown on this worksheet display the assignment of the Average Length of Customer Service Line, L_p , for the three most common piping configurations.

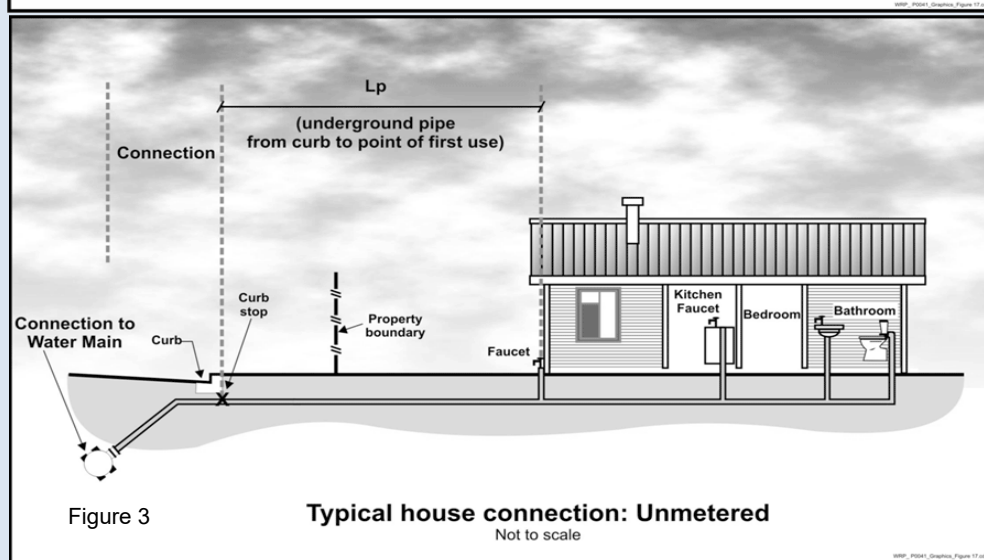
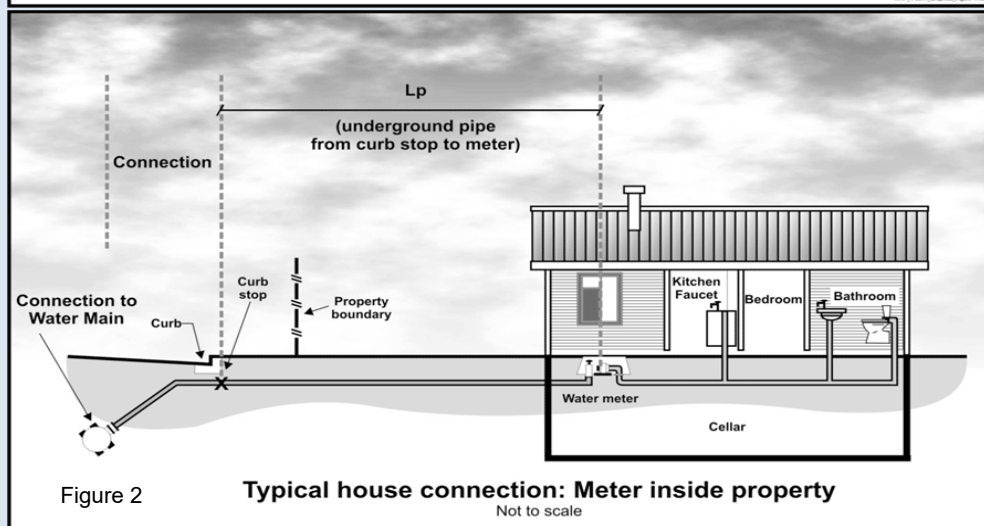
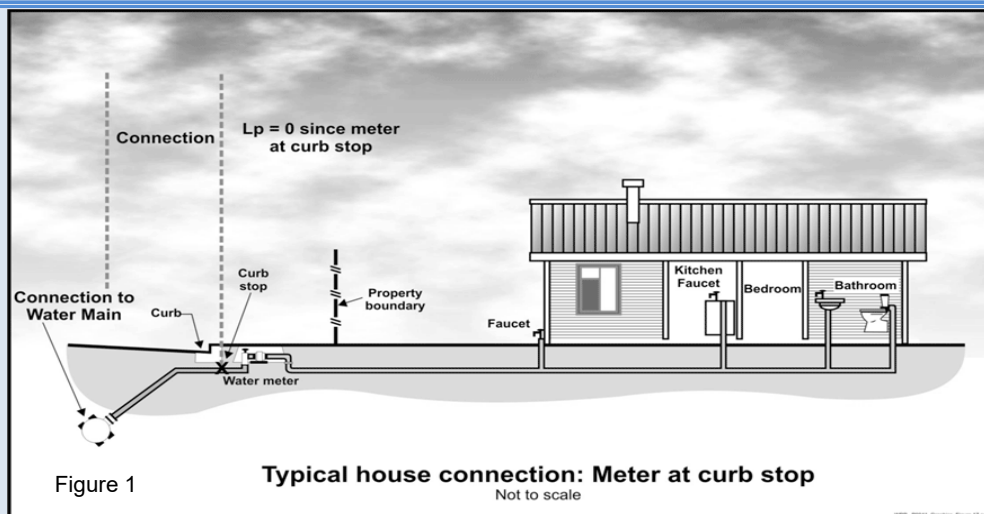
Figure 1 shows the configuration of the water meter outside of the customer building next to the curb stop valve. In this configuration $L_p = 0$ since the distance between the curb stop and the customer metering point is essentially zero.

Figure 2 shows the configuration of the customer water meter located inside the customer building, where L_p is the distance from the curb stop to the water meter.

Figure 3 shows the configuration of an unmetered customer building, where L_p is the distance from the curb stop to the first point of customer water consumption, or, more simply, the building line.

In any water system the L_p will vary notably in a community of different structures, therefore the average L_p value is used and this should be approximated or calculated if a sample of service line measurements has been gathered.

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AWWA Free Water Audit Software: Definitions

WAS v5.0

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Item Name	Description
Apparent Losses Find	<p>= unauthorized consumption + customer metering inaccuracies + systematic data handling errors</p> <p>Apparent Losses include all types of inaccuracies associated with customer metering (worn meters as well as improperly sized meters or wrong type of meter for the water usage profile) as well as systematic data handling errors (meter reading, billing, archiving and reporting), plus unauthorized consumption (theft or illegal use).</p> <p>NOTE: Over-estimation of Apparent Losses results in under-estimation of Real Losses. Under-estimation of Apparent Losses results in over-estimation of Real Losses.</p>
AUTHORIZED CONSUMPTION Find	<p>= billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption</p> <p>The volume of metered and/or unmetered water taken by registered customers, the water utility's own uses, and uses of others who are implicitly or explicitly authorized to do so by the water utility; for residential, commercial, industrial and public-minded purposes.</p> <p>Typical retail customers' consumption is tabulated usually from established customer accounts as billed metered consumption, or - for unmetered customers - billed unmetered consumption. These types of consumption, along with billed water exported, provide revenue potential for the water utility. Be certain to tabulate the water exported volume as a separate component and do not "double-count" it by including in the billed metered consumption component as well as the water exported component.</p> <p>Unbilled authorized consumption occurs typically in non-account uses, including water for fire fighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally these uses may be metered and billed (or charged a flat fee), but usually they are unmetered and unbilled. In the latter case, the water auditor may use a default value to estimate this quantity, or implement procedures for the reliable quantification of these uses. This starts with documenting usage events as they occur and estimating the amount of water used in each event. (See Unbilled unmetered consumption)</p>
View Service Connection Diagram Average length of customer service line Find	<p>This is the average length of customer service line, Lp, that is owned and maintained by the customer; from the point of ownership transfer to the customer water meter, or building line (if unmetered). The quantity is one of the data inputs for the calculation of Unavoidable Annual Real Losses (UARL), which serves as the denominator of the performance indicator: Infrastructure Leakage Index (ILI). The value of Lp is multiplied by the number of customer service connections to obtain a total length of customer owned piping in the system. The purpose of this parameter is to account for the unmetered service line infrastructure that is the responsibility of the customer for arranging repairs of leaks that occur on their lines. In many cases leak repairs arranged by customers take longer to be executed than leak repairs arranged by the water utility on utility-maintained piping. Leaks run longer - and lose more water - on customer-owned service piping, than utility owned piping.</p> <p>If the customer water meter exists near the ownership transfer point (usually the curb stop located between the water main and the customer premises) this distance is zero because the meter and transfer point are the same. This is the often encountered configuration of customer water meters located in an underground meter box or "pit" outside of the customer's building. The Free Water Audit Software asks a "Yes/No" question about the meter at this location. If the auditor selects "Yes" then this distance is set to zero and the data grading score for this component is set to 10.</p> <p>If water meters are typically located inside the customer premise/building, or properties are unmetered, it is up to the water auditor to estimate a system-wide average Lp length based upon the various customer land parcel sizes and building locations in the service area. Lp will be a shorter length in areas of high density housing, and a longer length in areas of low density housing and varied commercial and industrial buildings. General parcel demographics should be employed to obtain a composite average Lp length for the entire system.</p> <p>Refer to the "Service Connection Diagram" worksheet for a depiction of the service line/metering configurations that typically exist in water utilities. This worksheet gives guidance on the determination of the Average Length, Lp, for each configuration.</p>
Average operating pressure Find	<p>This is the average pressure in the distribution system that is the subject of the water audit. Many water utilities have a calibrated hydraulic model of their water distribution system. For these utilities, the hydraulic model can be utilized to obtain a very accurate quantity of average pressure. In the absence of a hydraulic model, the average pressure may be approximated by obtaining readings of static water pressure from a representative sample of fire hydrants or other system access points evenly located across the system. A weighted average of the pressure can be assembled; but be sure to take into account the elevation of the fire hydrants, which typically exist several feet higher than the level of buried water pipelines. If the water utility is compiling the water audit for the first time, the average pressure can be approximated, but with a low data grading. In subsequent years of auditing, effort should be made to improve the accuracy of the average pressure quantity. This will then qualify the value for a higher data grading.</p>
Billed Authorized Consumption	<p>All consumption that is billed and authorized by the utility. This may include both metered and unmetered consumption. See "Authorized Consumption" for more information.</p>
Billed metered consumption Find	<p>All metered consumption which is billed to retail customers, including all groups of customers such as domestic, commercial, industrial or institutional. It does NOT include water supplied to neighboring utilities (water exported) which is metered and billed. Be sure to subtract any consumption for exported water sales that may be included in these billing roles. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component. The metered consumption data can be taken directly from billing records for the water audit period. The accuracy of yearly metered consumption data can be refined by including an adjustment to account for customer meter reading lag time since not all customer meters are read on the same day of the meter reading period. However additional analysis is necessary to determine the lag time adjustment value, which may or may not be significant.</p>
Billed unmetered consumption Find	<p>All billed consumption which is calculated based on estimates or norms from water usage sites that have been determined <u>by utility policy</u> to be left unmetered. This is typically a very small component in systems that maintain a policy to meter their customer population. However, this quantity can be the key consumption component in utilities that have not adopted a universal metering policy. This component should NOT include any water that is supplied to neighboring utilities (water exported) which is unmetered but billed. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.</p>

Item Name	Description
Customer metering inaccuracies Find	<p>Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters gradually wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register the flow of water. This occurrence is common with smaller residential meters of sizes 5/8-inch and 3/4 inch after they have registered very large cumulative volumes of water, which generally occurs only after periods of years. For meters sized 1-inch and larger - typical of multi-unit residential, commercial and industrial accounts - meter under-registration can occur from wear or from the improper application of the meter; i.e. installing the wrong type of meter or the wrong size of meter, for the flow pattern (profile) of the consumer. For instance, many larger meters have reduced accuracy at low flows. If an oversized meter is installed, most of the time the routine flow will occur in the low flow range of the meter, and a significant portion of it may not be registered. It is important to properly select and install all meters, but particularly large customer meters, size 1-inch and larger.</p> <p>The auditor has two options for entering data for this component of the audit. The auditor can enter a percentage under-registration (typically an estimated value), this will apply the selected percentage to the two categories of metered consumption to determine the volume of water not recorded due to customer meter inaccuracy. Note that this percentage is a composite average inaccuracy for <u>all</u> customer meters in the entire meter population. The percentage will be multiplied by the sum of the volumes in the Billed Metered and Unbilled Metered components. Alternatively, if the auditor has substantial data from meter testing activities, he or she can calculate their own loss volumes, and this volume may be entered directly.</p> <p>Note that a value of zero will be accepted but an alert will appear asking if the customer population is unmetered. Since all metered systems have some degree of inaccuracy, a positive value should be entered. A value of zero in this component is valid only if the water utility does not meter its customer population.</p>
Customer retail unit cost Find	<p>The Customer Retail Unit Cost represents the charge that customers pay for water service. This unit cost is applied routinely to the components of Apparent Loss, since these losses represent water reaching customers but not (fully) paid for. Since most water utilities have a rate structure that includes a variety of different costs based upon class of customer, a weighted average of individual costs and number of customer accounts in each class can be calculated to determine a single composite cost that should be entered into this cell. Finally, the weighted average cost should also include additional charges for sewer, storm water or biosolids processing, <u>but only if</u> these charges are based upon the volume of potable water consumed.</p> <p>For water utilities in regions with limited water resources and a questionable ability to meet the drinking water demands in the future, the Customer Retail Unit Cost might also be applied to value the Real Losses; instead of applying the Variable Production Cost to Real Losses. In this way, it is assumed that every unit volume of leakage reduced by leakage management activities will be sold to a customer.</p> <p>Note: the Free Water Audit Software allows the user to select the units that are charged to customers (either \$/1,000 gallons, \$/hundred cubic feet, or \$/1,000 litres) and automatically converts these units to the units that appear in the "WATER SUPPLIED" box. The monetary units are United States dollars, \$.</p>
Infrastructure Leakage Index (ILI) Find	<p>The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.</p>
Length of mains Find	<p>Length of all pipelines (except service connections) in the system starting from the point of system input metering (for example at the outlet of the treatment plant). It is also recommended to include in this measure the total length of fire hydrant lead pipe. Hydrant lead pipe is the pipe branching from the water main to the fire hydrant. Fire hydrant leads are typically of a sufficiently large size that is more representative of a pipeline than a service connection. The average length of hydrant leads across the entire system can be assumed if not known, and multiplied by the number of fire hydrants in the system, which can also be assumed if not known. This value can then be added to the total pipeline length. Total length of mains can therefore be calculated as:</p> <p>Length of Mains, miles = (total pipeline length, miles) + [{(average fire hydrant lead length, ft) x (number of fire hydrants)} / 5,280 ft/mile] or Length of Mains, kilometres = (total pipeline length, kilometres) + [{(average fire hydrant lead length, metres) x (number of fire hydrants)} / 1,000 metres/kilometre]</p>
NON-REVENUE WATER Find	<p>= Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water which does not provide revenue potential to the utility.</p>
Number of <u>active</u> AND <u>inactive</u> service connections Find	<p>Number of customer service connections, extending from the water main to supply water to a customer. Please note that this includes the actual number of distinct piping connections, including fire connections, whether active or inactive. This may differ substantially from the number of customers (or number of accounts). Note: this number does not include the pipeline leads to fire hydrants - the total length of piping supplying fire hydrants should be included in the "Length of mains" parameter.</p>
Real Losses Find	<p>Physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.</p>
Revenue Water	<p>Those components of System Input Volume that are billed and have the potential to produce revenue.</p>
Service Connection Density Find	<p>=number of customer service connections / length of mains</p>

Item Name	Description
Systematic data handling errors <div>Find</div>	<p>Apparent losses caused by accounting omissions, errant computer programming, gaps in policy, procedure, and permitting/activation of new accounts; and any type of data lapse that results in under-stated customer water consumption in summary billing reports.</p> <p>Systematic Data Handling Errors result in a direct loss of revenue potential. Water utilities can find "lost" revenue by keying on this component.</p> <p>Utilities typically measure water consumption registered by water meters at customer premises. The meter should be read routinely (ex: monthly) and the data transferred to the Customer Billing System, which generates and sends a bill to the customer. <u>Data Transfer Errors</u> result in the consumption value being less than the actual consumption, creating an apparent loss. Such error might occur from illegible and mis-recorded hand-written readings compiled by meter readers, inputting an incorrect meter register unit conversion factor in the automatic meter reading equipment, or a variety of similar errors.</p> <p>Apparent losses also occur from <u>Data Analysis Errors</u> in the archival and data reporting processes of the Customer Billing System. Inaccurate estimates used for accounts that fail to produce a meter reading are a common source of error. Billing adjustments may award customers a rightful monetary credit, but do so by creating a negative value of consumption, thus under-stating the actual consumption. Account activation lapses may allow new buildings to use water for months without meter readings and billing. Poor permitting and construction inspection practices can result in a new building lacking a billing account, a water meter and meter reading; i.e., the customer is unknown to the utility's billing system.</p> <p>Close auditing of the permitting, metering, meter reading, billing and reporting processes of the water consumption data trail can uncover data management gaps that create volumes of systematic data handling error. Utilities should routinely analyze customer billing records to detect data anomalies and quantify these losses. For example, a billing account that registers zero consumption for two or more billing cycles should be checked to explain why usage has seemingly halted. Given the revenue loss impacts of these losses, water utilities are well-justified in providing continuous oversight and timely correction of data transfer errors & data handling errors.</p> <p>If the water auditor has not yet gathered detailed data or assessment of systematic data handling error, it is recommended that the auditor apply the default value of 0.25% of the Billed Authorized Consumption volume. However, if the auditor <u>has</u> investigated the billing system and its controls, and <u>has</u> well validated data that indicates the volume from systematic data handling error is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations and select an appropriate grading. <u>Note:</u> negative values are not allowed for this audit component. If the auditor enters zero for this component then a grading of 1 will be automatically assigned.</p>
Total annual cost of operating the water system <div>Find</div>	<p>These costs include those for operations, maintenance and any annually incurred costs for long-term upkeep of the drinking water supply and distribution system. It should include the costs of day-to-day upkeep and long-term financing such as repayment of capital bonds for infrastructure expansion or improvement. Typical costs include employee salaries and benefits, materials, equipment, insurance, fees, administrative costs and all other costs that exist to sustain the drinking water supply. Depending upon water utility accounting procedures or regulatory agency requirements, it may be appropriate to include depreciation in the total of this cost. This cost should not include any costs to operate wastewater, biosolids or other systems outside of drinking water.</p>
Unauthorized consumption <div>Find</div>	<p>Includes water illegally withdrawn from fire hydrants, illegal connections, bypasses to customer consumption meters, or tampering with metering or meter reading equipment; as well as any other ways to receive water while thwarting the water utility's ability to collect revenue for the water. Unauthorized consumption results in uncaptured revenue and creates an error that understates customer consumption. In most water utilities this volume is low and, if the water auditor has not yet gathered detailed data for these loss occurrences, it is recommended that the auditor apply a default value of 0.25% of the volume of water supplied. However, if the auditor has investigated unauthorized occurrences, and has well validated data that indicates the volume from unauthorized consumption is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations. Note that a value of zero will not be accepted since all water utilities have some volume of unauthorized consumption occurring in their system.</p> <p>Note: if the auditor selects the default value for unauthorized consumption, a data grading of 5 is automatically assigned, but not displayed on the Reporting Worksheet.</p>
Unavoidable Annual Real Losses (UARL) <div>Find</div>	<p>UARL (gallons/day)=(5.41Lm + 0.15Nc + 7.5Lc) xP, or UARL (litres/day)=(18.0Lm + 0.8Nc + 25.0Lc) xP</p> <p>where: Lm = length of mains (miles or kilometres) Nc = number of customer service connections Lp = the average distance of customer service connection piping (feet or metres) (see the Worksheet "Service Connection Diagram" for guidance on deterring the value of Lp) Lc = total length of customer service connection piping (miles or km) Lc = Nc X Lp (miles or kilometres) P = Pressure (psi or metres)</p> <p>The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). Striving to reduce system leakage to a level close to the UARL is usually not needed unless the water supply is unusually expensive, scarce or both.</p> <p>NOTE: The UARL calculation has not yet been proven as fully valid for very small, or low pressure water distribution systems. If,</p> <p><u>in gallons per day:</u> (Lm x 32) + Nc < 3000 or P < 35psi</p> <p><u>in litres per day:</u> (Lm x 20) + Nc < 3000 or P < 25m</p> <p>then the calculated UARL value may not be valid. The software does not display a value of UARL or ILI if either of these conditions is true.</p>

Item Name	Description
Unbilled Authorized Consumption	All consumption that is unbilled, but still authorized by the utility. This includes Unbilled Metered Consumption + Unbilled Unmetered Consumption. See "Authorized Consumption" for more information. For Unbilled Unmetered Consumption, the Free Water Audit Software provides the auditor the option to select a default value if they have not audited unmetered activities in detail. The default calculates a volume that is 1.25% of the Water Supplied volume. If the auditor has carefully audited the various unbilled, unmetered, authorized uses of water, and has established reliable estimates of this collective volume, then he or she may enter the volume directly for this component, and not use the default value.
Unbilled metered consumption	Metered consumption which is authorized by the water utility, but, for any reason, is <u>deemed by utility policy</u> to be unbilled. This might for example include metered water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic institutions free of charge. It does <u>not</u> include water supplied to neighboring utilities (water exported) which may be metered but not billed.
Unbilled unmetered consumption	Any kind of Authorized Consumption which is neither billed or metered. This component typically includes water used in activities such as fire fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. In most water utilities it is a small component which is very often substantially overestimated. It does NOT include water supplied to neighboring utilities (water exported) which is unmetered and unbilled – an unlikely case. This component has many sub-components of water use which are often tedious to identify and quantify. Because of this, and the fact that it is usually a small portion of the water supplied, it is recommended that the auditor apply the default value, which is 1.25% of the Water Supplied volume. Select the default percentage to enter this value. If the water utility <u>has</u> carefully audited the unbilled, unmetered activities occurring in the system, and has well validated data that gives a value substantially higher or lower than the default volume, then the auditor should enter their own volume. However the default approach is recommended for most water utilities. Note that a value of zero is not permitted, since all water utilities have some volume of water in this component occurring in their system.
Units and Conversions	The user may develop an audit based on one of three unit selections: 1) Million Gallons (US) 2) Megalitres (Thousand Cubic Metres) 3) Acre-feet Once this selection has been made in the instructions sheet, all calculations are made on the basis of the chosen units. Should the user wish to make additional conversions, a unit converter is provided below (use drop down menus to select units from the yellow unit boxes): <div><div>Enter Units:</div><div>Convert From...</div><div>=</div><div>Converts to....</div></div> <div><div>1</div><div>Million Gallons (US)</div><div></div><div>3.06888329</div><div>Acre-feet</div></div> <div>(conversion factor = 3.06888328973723)</div>
Use of Option Buttons	To use the default percent value choose this button To enter a value choose this button and enter the value in the cell to the right <div><div>Pcnt:</div><div>Value:</div><div>1.25%</div><div></div><div></div></div> <p>NOTE: For Unbilled Unmetered Consumption, Unauthorized Consumption and Systematic Data Handling Errors, a recommended default value can be applied by selecting the Percent option. The default values are based on fixed percentages of Water Supplied or Billed Authorized Consumption and are recommended for use in this audit unless the auditor has well validated data for their system. Default values are shown by purple cells, as shown in the example above.</p> <p>If a default value is selected, the user does not need to grade the item; a grading value of 5 is automatically applied (however, this grade will not be displayed).</p>
Variable production cost (applied to Real Losses)	The cost to produce and supply the next unit of water (e.g., \$/million gallons). This cost is determined by calculating the summed unit costs for ground and surface water treatment and all power used for pumping from the source to the customer. It may also include other miscellaneous unit costs that apply to the production of drinking water. It should also include the unit cost of bulk water purchased as an import if applicable. It is common to apply this unit cost to the volume of Real Losses. However, if water resources are strained and the ability to meet future drinking water demands is in question, then the water auditor can be justified in applying the Customer Retail Rate to the Real Loss volume, rather than applying the Variable Production Cost. The Free Water Audit Software applies the Variable Production costs to Real Losses by default. However, the auditor has the option on the Reporting Worksheet to select the Customer Retail Cost as the basis for the Real Loss cost evaluation if the auditor determines that this is warranted.
Volume from own sources	The volume of water withdrawn (abstracted) from water resources (rivers, lakes, streams, wells, etc) controlled by the water utility, and then treated for potable water distribution. Most water audits are compiled for utility retail water distribution systems, so this volume should reflect the amount of <u>treated</u> drinking water that entered the distribution system. Often the volume of water measured at the effluent of the treatment works is slightly less than the volume measured at the raw water source, since some of the water is used in the treatment process. Thus, it is useful if flows are metered at the effluent of the treatment works. If metering exists only at the raw water source, an adjustment for water used in the treatment process should be included to account for water consumed in treatment operations such as filter backwashing, basin flushing and cleaning, etc. If the audit is conducted for a wholesale water agency that sells untreated water, then this quantity reflects the measure of the raw water, typically metered at the source.

Item Name	Description
Volume from own sources: Master meter and supply error adjustment <input type="button" value="Find"/>	<p>An estimate or measure of the degree of inaccuracy that exists in the master (production) meters measuring the annual Volume from own Sources, and any error in the data trail that exists to collect, store and report the summary production data. This adjustment is a weighted average number that represents the collective error for all master meters for all days of the audit year and any errors identified in the data trail. Meter error can occur in different ways. A meter or meters may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Data error can occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of inaccuracy in master meters and data errors in archival systems are common; thus a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration.</p>
Water exported <input type="button" value="Find"/>	<p>The Water Exported volume is the bulk water conveyed and sold by the water utility to neighboring water systems that exists outside of their service area. Typically this water is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water utility that is selling the water: i.e. the exporter. If the water utility who is compiling the annual water audit sells bulk water in this manner, they are an exporter of water.</p> <p>Note: The Water Exported volume is sold to wholesale customers who are typically charged a wholesale rate that is different than retail rates charged to the retail customers existing within the service area. Many state regulatory agencies require that the Water Exported volume be reported to them as a quantity separate and distinct from the retail customer billed consumption. For these reasons - and others - the Water Exported volume is always quantified separately from Billed Authorized Consumption in the standard water audit. Be certain not to "double-count" this quantity by including it in both the Water Exported box and the Billed Metered Consumption box of the water audit Reporting Worksheet. This volume should be included only in the Water Exported box.</p>
Water exported: Master meter and supply error adjustment <input type="button" value="Find"/>	<p>An estimate or measure of the volume in which the Water Exported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived exported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of error in their metered data, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived data. Thus, a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment. Corrections to data gaps or other errors found in the archived data should also be included as a portion of this meter error adjustment.</p>
Water imported <input type="button" value="Find"/>	<p>The Water Imported volume is the bulk water purchased to become part of the Water Supplied volume. Typically this is water purchased from a neighboring water utility or regional water authority, and is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water supplier selling the water to the utility conducting the water audit. The water supplier selling the bulk water usually charges the receiving utility based upon a wholesale water rate.</p>
Water imported: Master meter and supply error adjustment <input type="button" value="Find"/>	<p>An estimate or measure of the volume in which the Water Imported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived imported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some level of meter inaccuracy, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived metered data. Thus, a value of zero should <u>not</u> be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment.</p>
WATER LOSSES <input type="button" value="Find"/>	<p>= apparent losses + real losses</p> <p>Water Losses are the difference between Water Supplied and Authorized Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission systems, pressure zones or district metered areas (DMA); if one of these configurations are the basis of the water audit.</p>



AWWA Free Water Audit Software: Determining Water Loss Standing

WAS v5.0

American Water Works Association,
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Water Audit Report for: Eastern Municipal Water District

Reporting Year: 2014-2015 7/2014 - 6/2015

Data Validity Score: 78

Water Loss Control Planning Guide

Functional Focus Area	Water Audit Data Validity Level / Score				
	Level I (0-25)	Level II (26-50)	Level III (51-70)	Level IV (71-90)	Level V (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities in gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

Note: this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

General Guidelines for Setting a Target ILI
(without doing a full economic analysis of leakage control options)

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 -5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		



AWWA Free Water Audit Software: Examples of Completed and Validated Audits

WAS v5.0

American Water Works Association.
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Example 1a: Million Gallons:

Example 1b: Million Gallons:
Performance IndicatorsExample 2a: Megalitres:
Reporting WorksheetExample 2b: Megalitres:
Reporting Worksheet

Example Audit 1a:

AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association
Copyright © 2014. All Rights Reserved[Click to access definition](#)
[Click to add a comment](#)Water Audit Report for: **City of Asheville (01-11-010)**
Reporting Year: **2013** 7/2012 - 6/2013

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter Error Adjustments

WATER SUPPLIED

Volume from own sources: 7,352.880 MG/Yr
Water imported: 0.000 MG/Yr
Water exported: 0.000 MG/Yr

Pcnt: 3 Value: MG/Yr
☐ ☒ ☐ ☐ MG/Yr
☐ ☒ ☐ ☐ MG/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 7,067.430 MG/Yr

AUTHORIZED CONSUMPTION

Billed metered: 4,782.250 MG/Yr
Billed unmetered: 0.000 MG/Yr
Unbilled metered: 27.757 MG/Yr
Unbilled unmetered: 157.790 MG/Yr

Unbilled Unmetered volume entered is greater than the recommended default value

AUTHORIZED CONSUMPTION: 4,967.797 MG/Yr

Click here: [?](#)
for help using option
buttons below

Pcnt: 0.25 Value: MG/Yr
☐ ☒ ☐ ☐ MG/Yr

Use buttons to select
percentage of water
supplied
OR
value

Pcnt: 0.25 Value: MG/Yr
☐ ☒ ☐ ☐ MG/Yr

☐ 2.26% ☒ ☐ ☐ MG/Yr
☐ 0.25% ☒ ☐ ☐ MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption)

2,099.633 MG/Yr

Apparent Losses

Unauthorized consumption: 17.669 MG/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies: 111.220 MG/Yr
Systematic data handling errors: 11.956 MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 140.844 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,958.789 MG/Yr**WATER LOSSES: 2,099.633 MG/Yr**

NON-REVENUE WATER

NON-REVENUE WATER: 2,285.180 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains: 1,236.5 miles
Number of active AND inactive service connections: 55,256
Service connection density: 45 conn./mile main

Are customer meters typically located at the curbside or property line? ☒ Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 145.3 psi

COST DATA

Total annual cost of operating water system: \$33,630,676 \$/Year
Customer retail unit cost (applied to Apparent Losses): \$3.22 \$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses): \$335.94 \$/Million gallons ☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 72 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources**2: Variable production cost (applied to Real Losses)****3: Unauthorized consumption**



Example Audit 1b:

AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0
American Water Works Association
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Water Audit Report for: **City of Asheville (01-11-010)**

Reporting Year: **2013** **7/2012 - 6/2013**

***** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 *****

System Attributes:

Apparent Losses: **140.844** MG/Yr
+ Real Losses: **1,958.789** MG/Yr
= **Water Losses: 2,099.633** MG/Yr

? Unavoidable Annual Real Losses (UARL): **794.34** MG/Yr

Annual cost of Apparent Losses: **\$606,265**

Annual cost of Real Losses: **\$658,036**

Valued at **Variable Production Cost**

[Return to Reporting Worksheet to change this assumption](#)

Performance Indicators:

Financial:

Non-revenue water as percent by volume of Water Supplied: **32.3%**
Non-revenue water as percent by cost of operating system: **3.9%** Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: **6.98** gallons/connection/day
Real Losses per service connection per day: **97.12** gallons/connection/day
Real Losses per length of main per day*: **N/A**
Real Losses per service connection per day per psi pressure: **0.67** gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): **1,958.79** million gallons/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]: **2.47**

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



Example Audit 2a:

AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association
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Click to access definition
Click to add a comment

Water Audit Report for: **The City of Calgary**Reporting Year: **2013** 1/2013 - 12/2013

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MEGALITRES (THOUSAND CUBIC METRES) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

Enter grading in column 'E' and 'J' -----

Volume from own sources:	+	?	7	174,324.000	ML/Yr	+	?	7	1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr
Water imported:	+	?	n/a	0.000	ML/Yr	+	?	7	1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr
Water exported:	+	?	7	8,190.131	ML/Yr	+	?	7	1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr

Master Meter Error Adjustments

Pcnt: Value:

1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr
1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr
1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **164,488.979** ML/Yr

AUTHORIZED CONSUMPTION

Billed metered:	+	?	6	125,111.268	ML/Yr
Billed unmetered:	+	?	8	3,503.386	ML/Yr
Unbilled metered:	+	?	7	166.157	ML/Yr
Unbilled unmetered:	+	?	6	1,444.000	ML/Yr

Click here: ?
for help using option
buttons below

Pcnt: Value:

	<input type="radio"/>	<input checked="" type="radio"/>	1,444.000	ML/Yr
--	-----------------------	----------------------------------	-----------	-------

Use buttons to select
percentage of water
supplied
OR
value

AUTHORIZED CONSUMPTION: **130,224.811** ML/Yr

WATER LOSSES (Water Supplied - Authorized Consumption)

34,264.168 ML/Yr

Apparent Losses

Unauthorized consumption: **411.222** ML/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies: **1,265.429** ML/YrSystematic data handling errors: **312.778** ML/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **1,989.429** ML/Yr

Pcnt: Value:

0.25%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr
-------	----------------------------------	-----------------------	--	-------

1.00%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr
0.25%	<input checked="" type="radio"/>	<input type="radio"/>		ML/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **32,274.739** ML/Yr**WATER LOSSES:** **34,264.168** ML/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **35,874.325** ML/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	8	4,945.0	kilometers
Number of <u>active</u> AND <u>inactive</u> service connections:	+	?	8	312,075	
Service connection density:	+	?		63	conn./km main

Are customer meters typically located at the curbside or property line?

Average length of customer service line: **12.0** metres (length of service line, beyond the property boundary, that is the responsibility of the utility)Average operating pressure: **50.8** metres (head)

COST DATA

Total annual cost of operating water system:	+	?	9	\$169,973,759	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	\$2.35	\$/1000 litres
Variable production cost (applied to Real Losses):	+	?	9	\$73.54	\$/Megalitre

☒ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 72 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources**2: Billed metered****3: Customer metering inaccuracies**



Example Audit 2b:

AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association
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Water Audit Report for: **The City of Calgary**

Reporting Year: **2013** **1/2013 - 12/2013**

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

Apparent Losses:	1,989.429	ML/Yr	
+	Real Losses:	32,274.739	ML/Yr
=	Water Losses:	34,264.168	ML/Yr

Unavoidable Annual Real Losses (UARL): 8,015.57 ML/Yr

Annual cost of Apparent Losses: \$4,675,159

Annual cost of Real Losses: \$75,845,637 Valued at **Customer Retail Unit Cost**
Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial: { Non-revenue water as percent by volume of Water Supplied: 21.8%
Non-revenue water as percent by cost of operating system: 49.6% Real Losses valued at Customer Retail Unit Cost

Operational Efficiency: { Apparent Losses per service connection per day: 17.47 litres/connection/day
Real Losses per service connection per day: 283.34 litres/connection/day
Real Losses per length of main per day*: N/A
Real Losses per service connection per day per meter (head) pressure: 5.58 litres/connection/day/m

From Above, Real Losses = Current Annual Real Losses (CARL): 32,274.74 ML/year

Infrastructure Leakage Index (ILI) [CARL/UARL]: 4.03

* This performance indicator applies for systems with a low service connection density of less than 20 service connections/kilometre of pipeline



AWWA Water Audit Software Version 5.0 Developed by the Water Loss Control Committee of the American Water Works Association August, 2014

This software is intended to serve as a basic tool to compile a preliminary, or “top-down”, water audit. It is recommended that users also refer to the current edition of the AWWA M36 Publication, Water Audits and Loss Control Programs, for detailed guidance on compiling a comprehensive, or “bottom-up”, water audit using the same water audit methodology.

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REFERENCES: - Alegre, H., Hirner, W., Baptista, J. and Parena, R. Performance Indicators for Water Supply Services. IWA Publishing ‘Manual of Best Practice’ Series, 2000. ISBN 1 900222 272
- Kunkel, G. et al, 2003. Water Loss Control Committee Report: Applying Worldwide Best Management Practices in Water Loss Control. Journal AWWA, 95:8:65
- AWWA Water Audits and Loss Control Programs, M36 Publication, 3rd Edition, 2009
- Service Connection Diagrams courtesy of Ronnie McKenzie, WRP Pty Ltd.

VERSION HISTORY:

Version:	Release Date:	Number of Worksheets:	Key Features and Developments
v1	2005/ 2006	5	The AWWA Water Audit Software was piloted in 2005 (v1.0 beta). The early versions (1.x) of the software restricted data entry to units of Million Gallons per year. For each entry into the audit, users identified whether the input was measured or estimated.
v2	2006	5	The most significant enhancement in v2 of the software was to allow the user to choose the volumetric units to be used in the audit, Million Gallons or Thousand Cubic Metres (megalitres) per year. Two financial performance indicators were added to provide feedback to the user on the cost of Real and Apparent losses.
v3	2007	7	In v3, the option to report volumetric units in acre-feet was added. Another new feature in v3 was the inclusion of default values for two water audit components (unbilled unmetered and unauthorized consumption). v3 also included two examples of completed audits in units of million gallons and Megalitres. Several checks were added into v3 to provide instant feedback to the user on common data entry problems, in order to help the user complete an accurate water audit.
v4 - v4.2	2010	10	v4 (and versions 4.x) of the software included a new approach to data grading. The simple "estimated" or "measured" approach was replaced with a more granular scale (typically 1-10) that reflected descriptions of utility practices and served to describe the confidence and accuracy of the input data. Each input value had a corresponding scale fully described in the Grading Matrix tab. The Grading Matrix also showed the actions required to move to a higher grading score. Grading descriptions were available on the Reporting Worksheet via a pop-up box next to each water audit input. A water audit data validity score is generated (max = 100) and priority areas for attention (to improve audit accuracy) are identified, once a user completes the required data grading. A service connection diagram was also added to help users understand the impact of customer service line configurations on water losses and how this information should be entered into the water audit software. An acknowledgements section was also added. Minor bug fixes resulted in the release of versions 4.1 and 4.2. A French language version was also made available for v4.2.
v5	2014	12	In v5, changes were made to the way Water Supplied information is entered into software, with each major component having a corresponding Master Meter Error Adjustment entry (and data grading requirement). This required changes to the data validity score calculation; v5 of the software uses a weighting system that is, in part, proportional to the volume of input components. The Grading Matrix was updated to reflect the new audit inputs and also to include clarifications and additions to the scale descriptions. The appearance of the software was updated in v5 to make the software more user-friendly and several new features were added to provide more feedback to the user. Notably, a dashboard tab has been added to provide more visual feedback on the water audit results and associated costs of Non-Revenue Water. A comments sheet was added to allow the user to track notes, comments and to cite sources used.

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Appendix E - West San Jacinto Groundwater Basin Management Plan

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**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.)

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Page iii	Last item under Section 7: TRANSFER <u>EXCHANGE</u> OF AGRICULTURAL AND OTHER NON-POTABLE USERS <u>USES</u> FROM GROUNDWATER TO RECLAIMED WATER.
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Section 1 - Executive Summary

Page 1-1	1st ¶, 3rd bullet item: • structural adequacy <u>capacity</u> 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 <u>a neighboring water district</u> 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 <u>Moreno Valley</u> Mutual Water Company ...
Page 1-4	2nd ¶, 2nd and 3rd sentences: Water requirements by these subagencies varies <u>vary</u> depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city <u>City</u> of Perris, Edgemont Gardens <u>Moreno Valley</u> 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: ... ~~Edgement Gardens~~ Moreno Valley Mutual Water Company, ...

5th ¶, 1st line: ~~Edgement 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-4.

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: ~~Temeseal~~ 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 rRemaining 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 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 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~~

DRAFT
GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

Prepared for
EASTERN MUNICIPAL WATER DISTRICT

SEPTEMBER 1994

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A-2 Proposed Regulation: Title 22, California Code of Regulations

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A-3 Drinking Water Standards and Health Advisories Table

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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.

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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:

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- "§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.

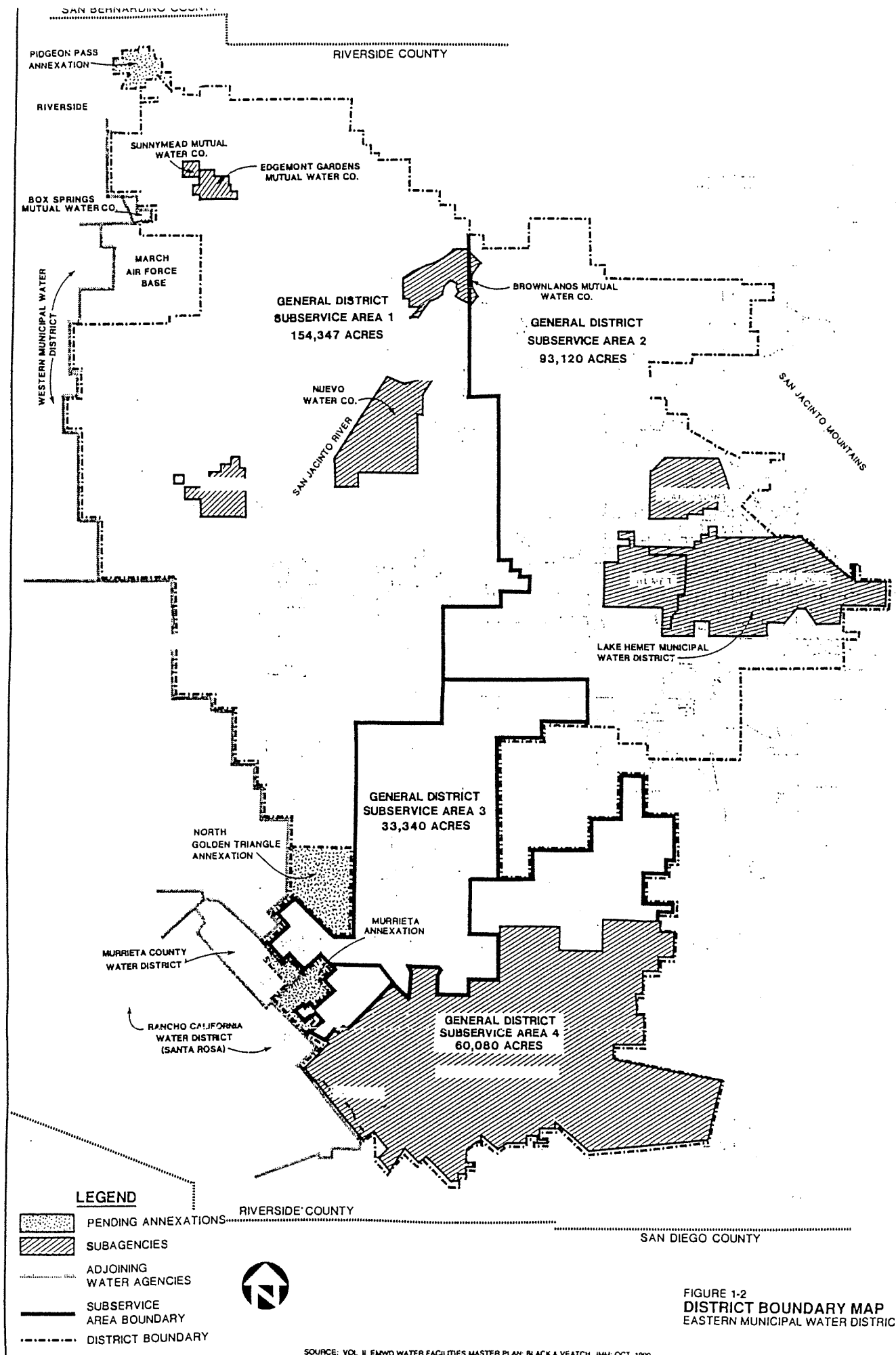


FIGURE 1-2
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

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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.

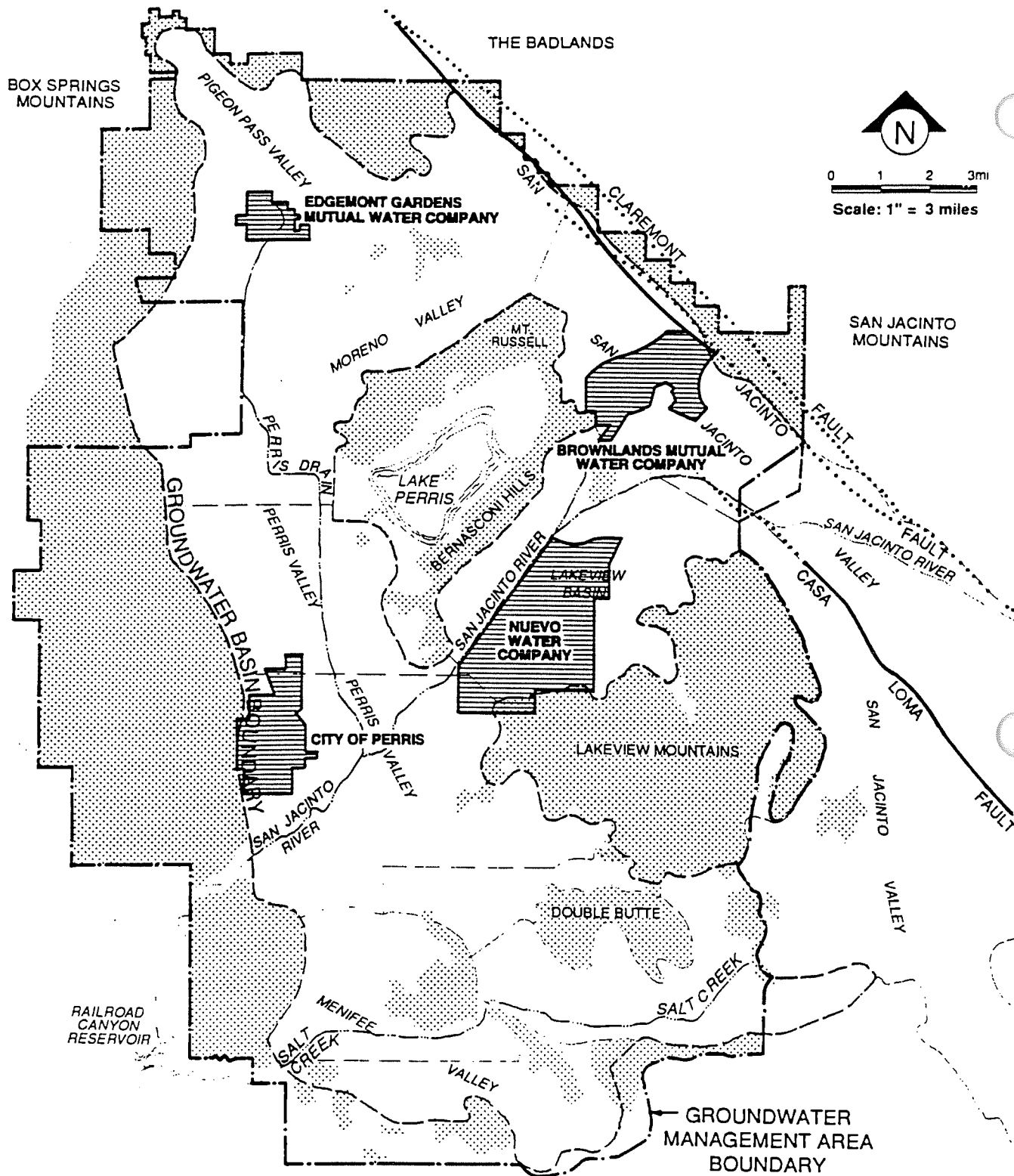
EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public 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**

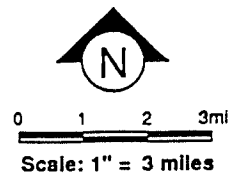
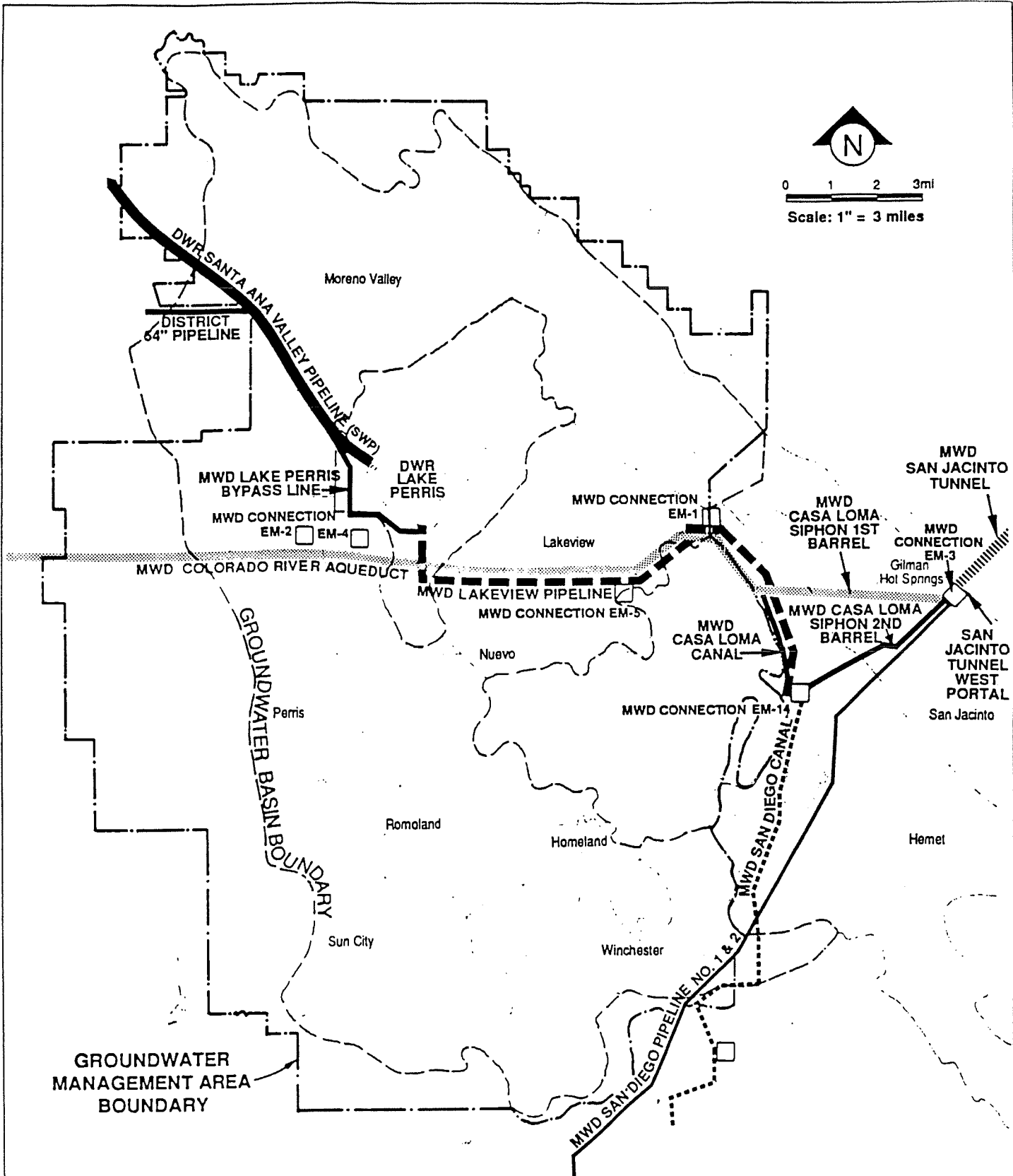


Figure 1-4
**IMPORTED
 WATER
 FACILITIES**

REFERENCE: EMWD WATER FACILITIES MASTER PLAN, FIG. 4-3: SOURCES OF SUPPLY MAP, OCTOBER, 1990.

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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.

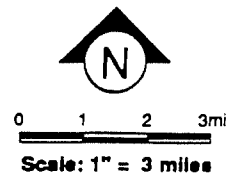
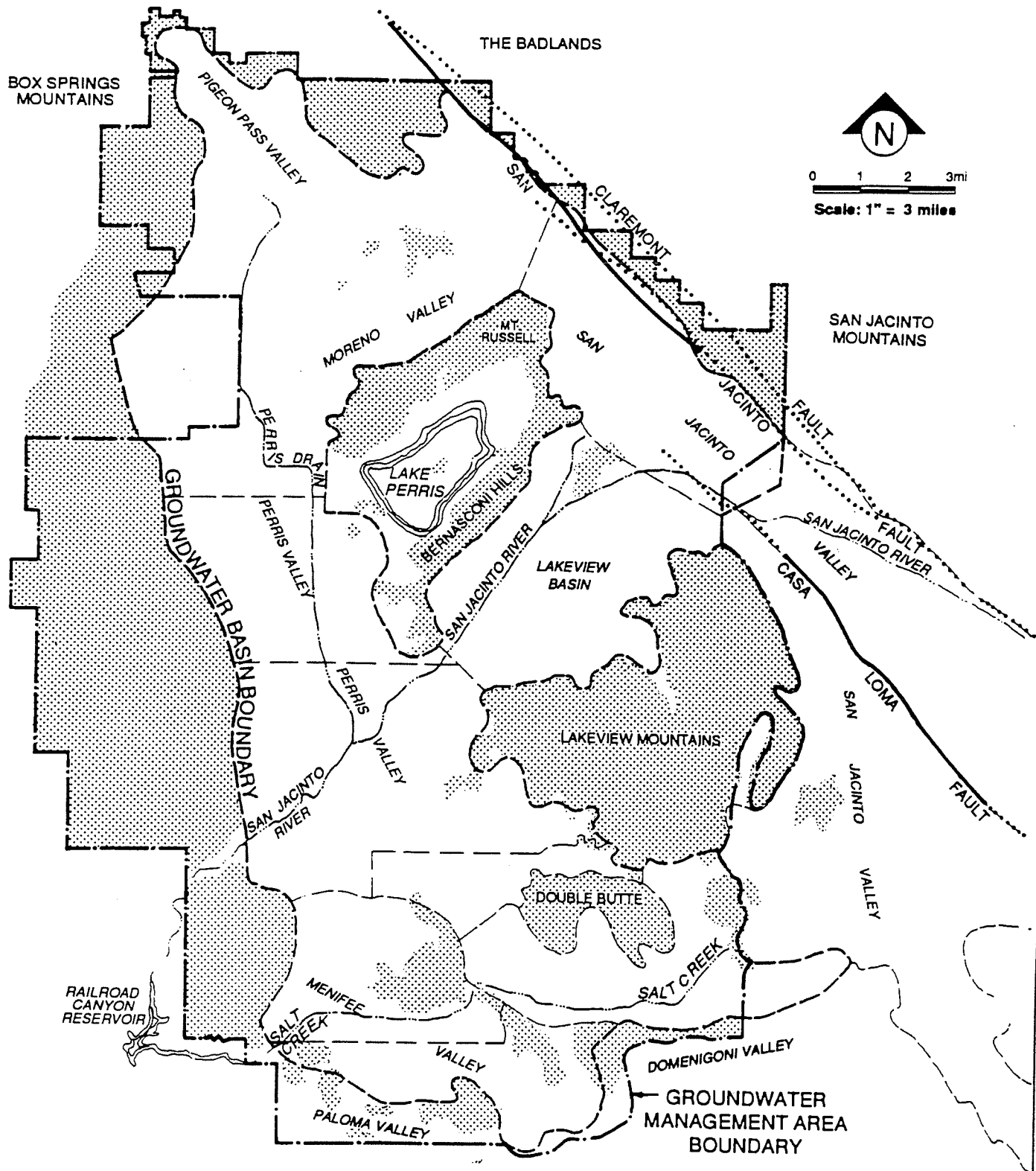
Riverside County Planning Department. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus, this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.

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**

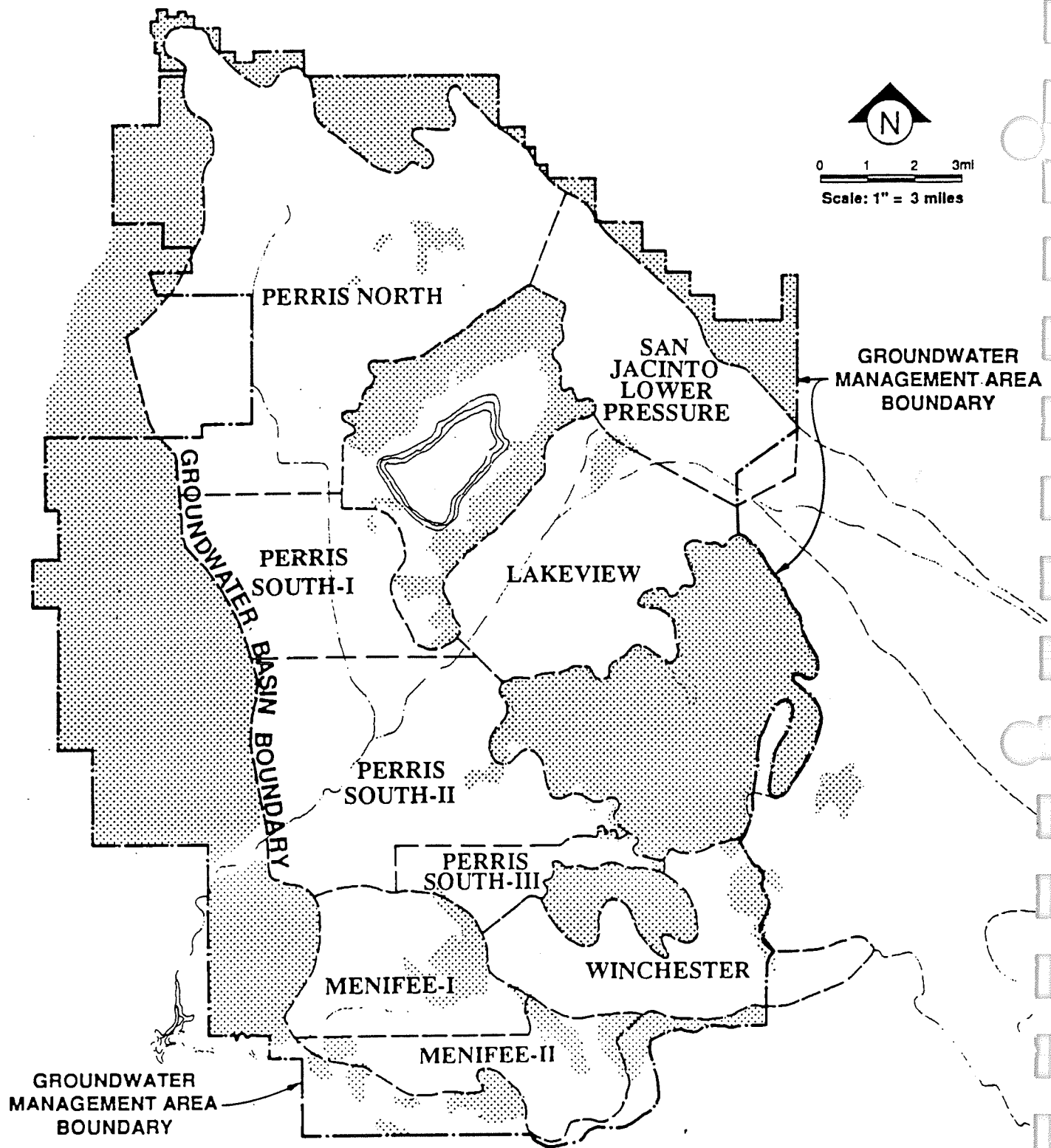


Figure 1-6
**GROUNDWATER
SUBBASINS**

**TABLE 1-1
AVAILABILITY OF GROUNDWATER IN THE
WEST SAN JACINTO BASIN**

Subbasin	Volume in Storage	Storage Capacity	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield	Safe Yield with Wastewater Recharge	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration	Average Nitrate Concentration (as Nitrogen)
	(acre-ft)	(acre-ft)		(acre-ft/yr)	(acre-ft/yr)		(mg/L)	(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
Meniffee	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

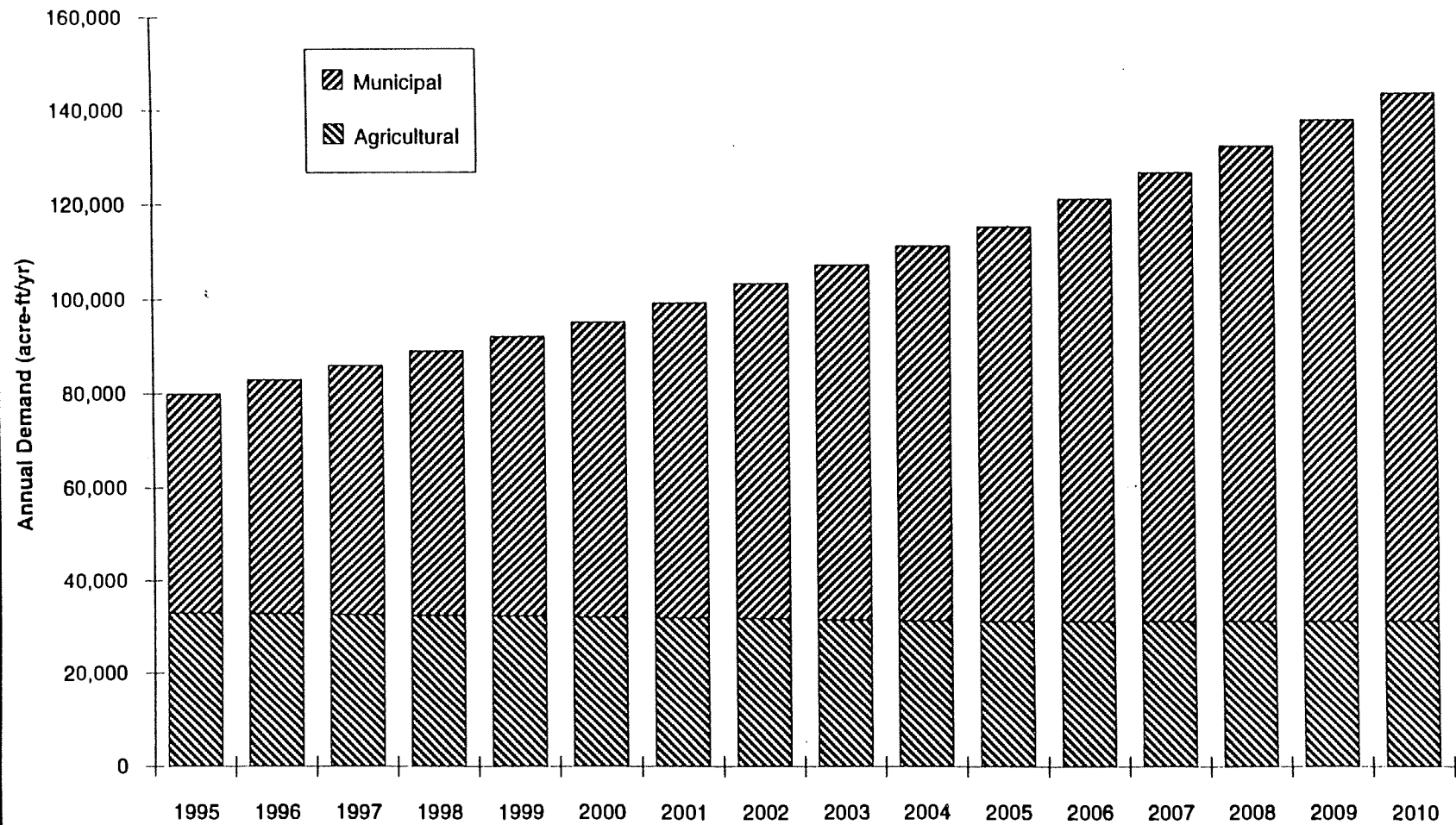
Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 1-2 and shown graphically in Figure 1-7. These estimates are based on land use and population projections and projected water use rates. Municipal demands in the West

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

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:

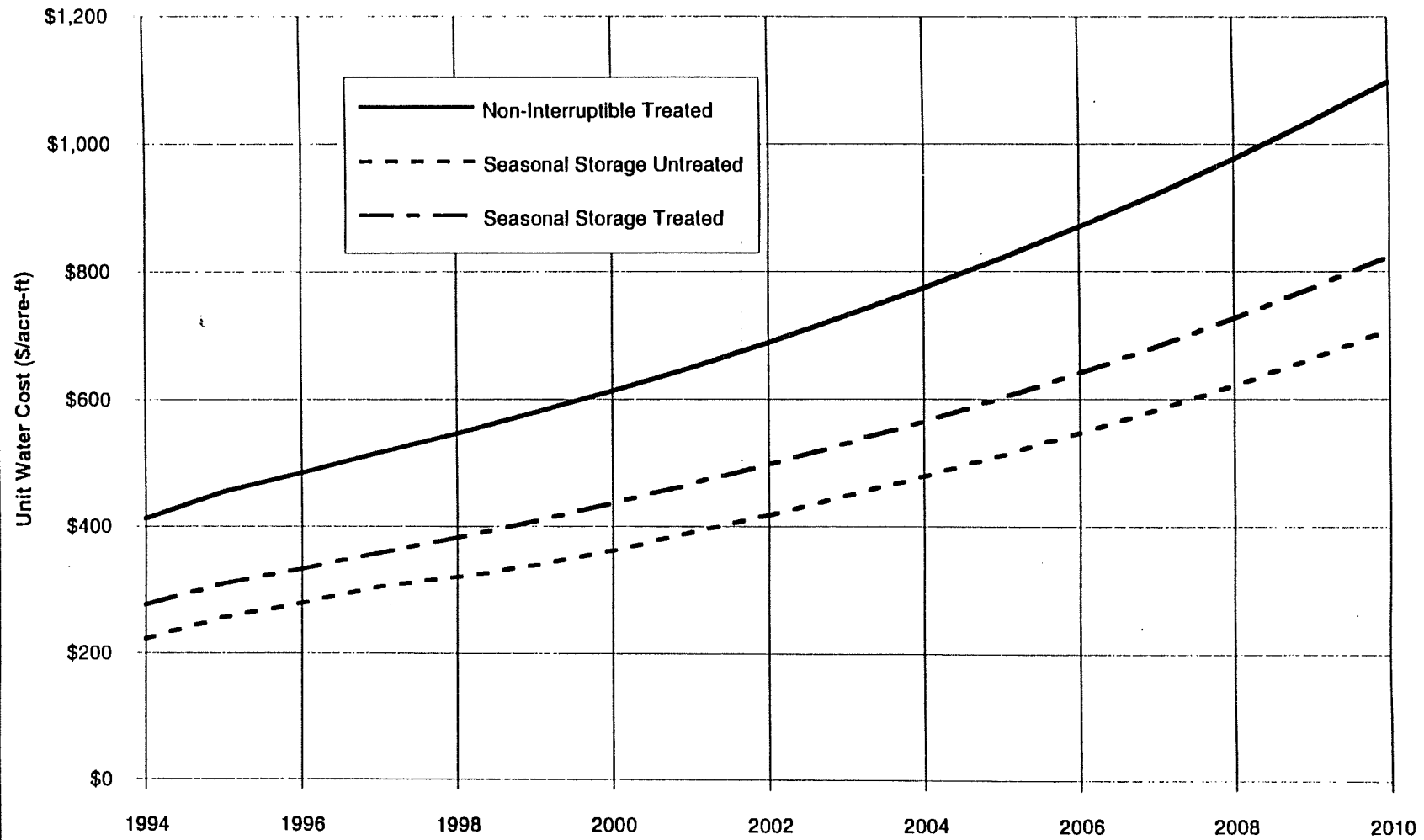
- ☐ a base (non-interruptible) rate;
- ☐ a treatment surcharge to be added to the base rate for purchases of treated water; and
- ☐ a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

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



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health, but may cause taste, odor, 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.

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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 Meniffee 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%
Meniffee 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
<u>Municipal Demand</u>	<u>47,000</u>	<u>100%</u>	<u>63,000</u>	<u>100%</u>	<u>84,000</u>	<u>100%</u>	<u>112,000</u>	<u>100%</u>
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Meniffee 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%
<u>Agricultural Demand</u>	<u>33,000</u>	<u>100%</u>	<u>32,000</u>	<u>100%</u>	<u>31,000</u>	<u>100%</u>	<u>31,000</u>	<u>100%</u>
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%
<u>Total Demand</u>	<u>80,000</u>	<u>100%</u>	<u>95,000</u>	<u>100%</u>	<u>115,000</u>	<u>100%</u>	<u>143,000</u>	<u>100%</u>
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Meniffee 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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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 total water supply for all water users in the West San Jacinto Groundwater Basin Management area.

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.

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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

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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

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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.

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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.

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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

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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

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- ☐ 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

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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	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.

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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 |

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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.

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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.

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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."

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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 must 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.

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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

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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

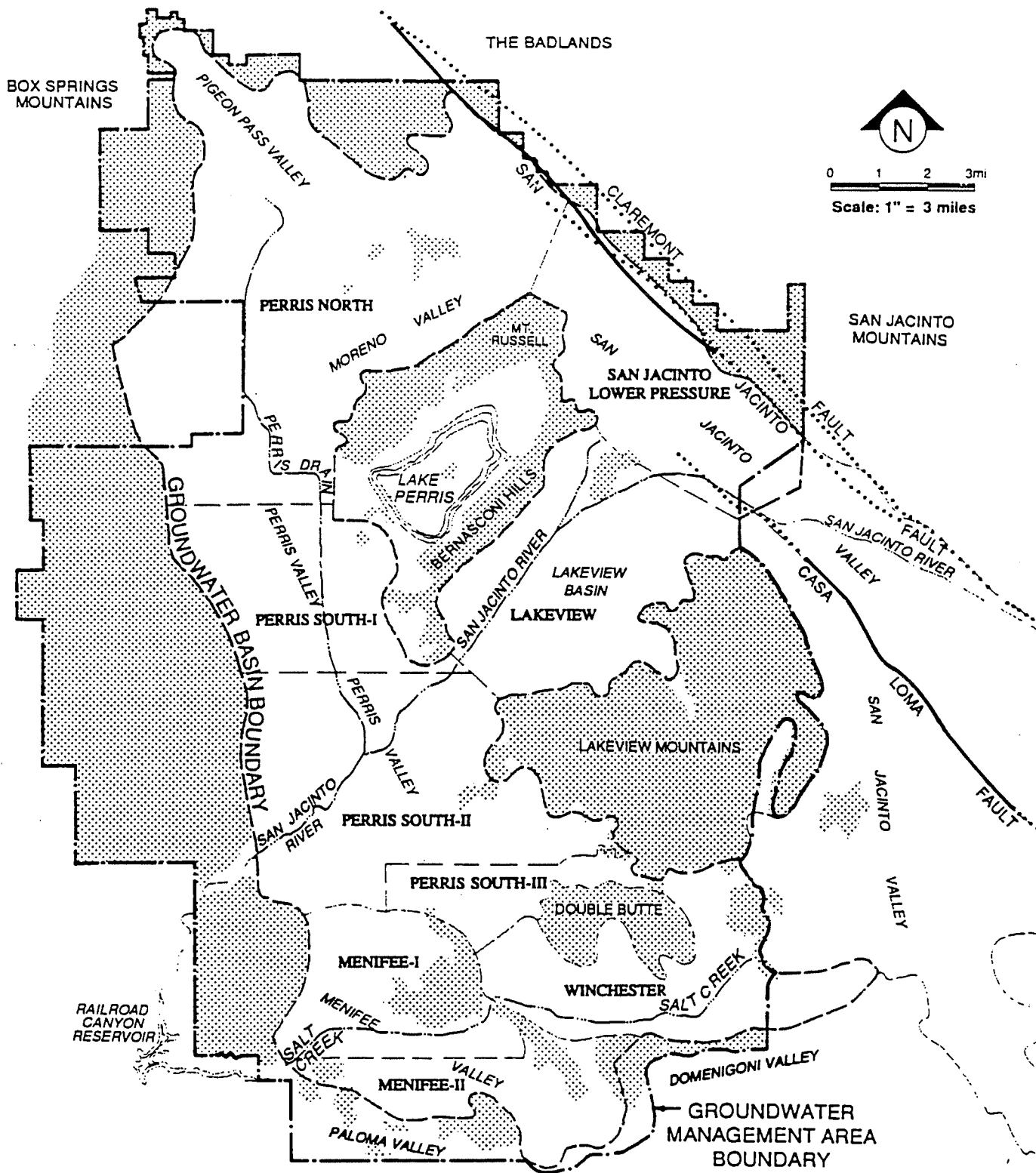
Section 6 Groundwater Management Goals

Section 7 Elements of the Groundwater Management Plan

Section 8 Description of the Groundwater Management Plan

ACKNOWLEDGMENTS

A great deal of research and data gathering went into the preparation of this study and report. Assistance in research, data gathering and plan formulation was provided by the staff of EMWD, in particular Dr. Behrooz Mortazavi and Dr. P. Ravishanker. Their help was greatly appreciated.



LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS

Figure 2-1
LOCATION MAP

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

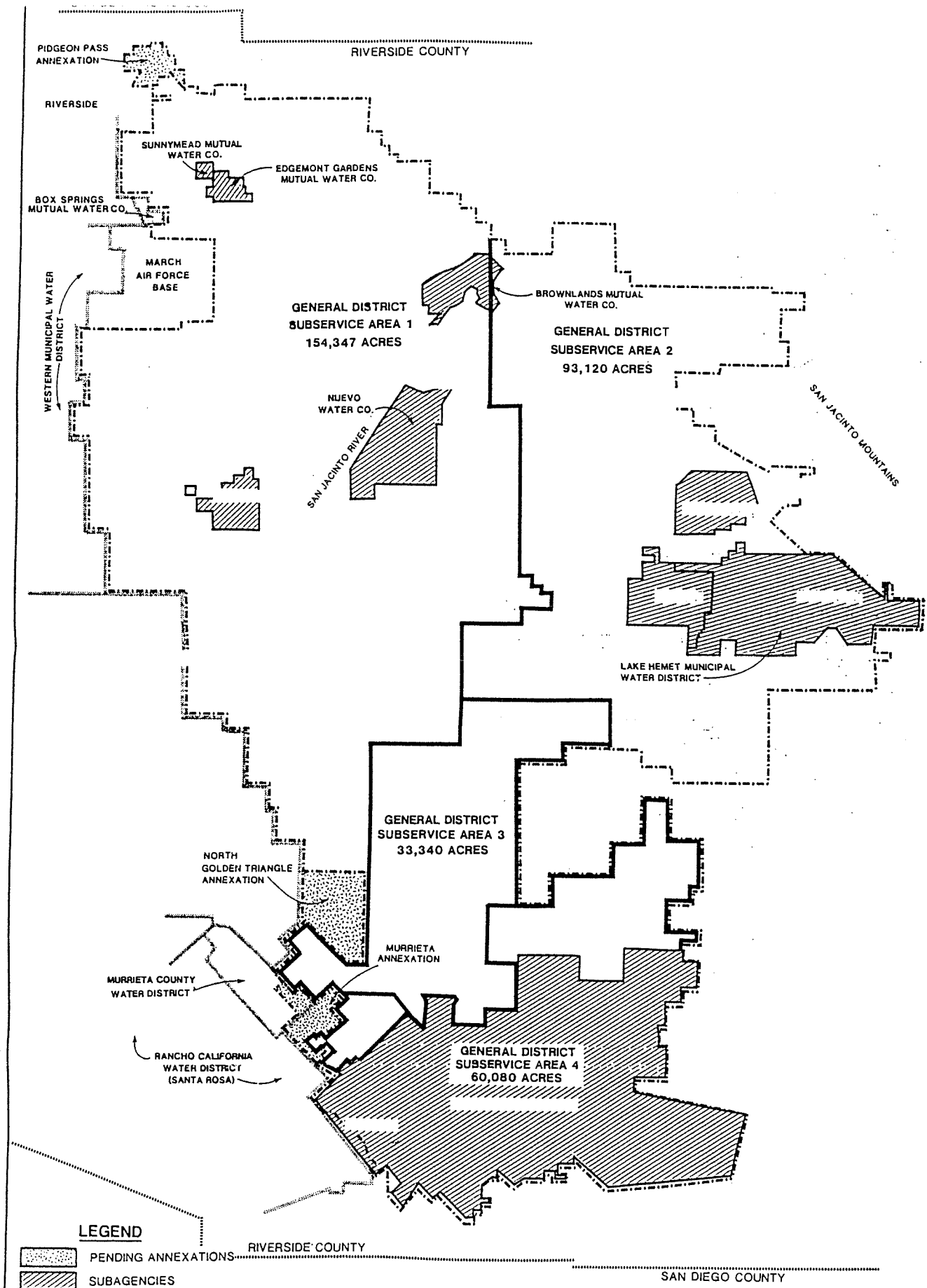
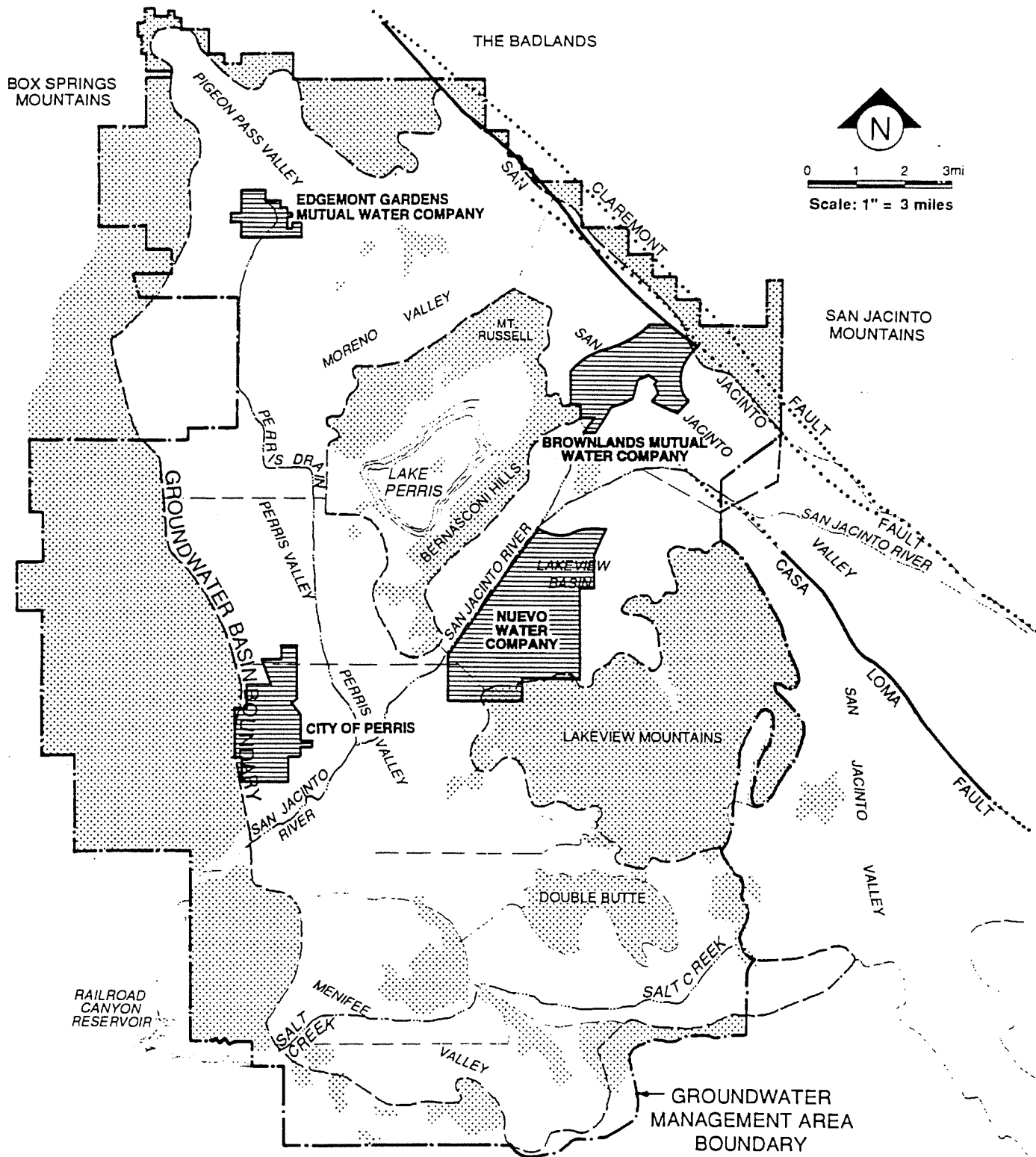


FIGURE 3-1
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT



LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS

**Figure 3-2
SUBAGENCIES**

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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

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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.

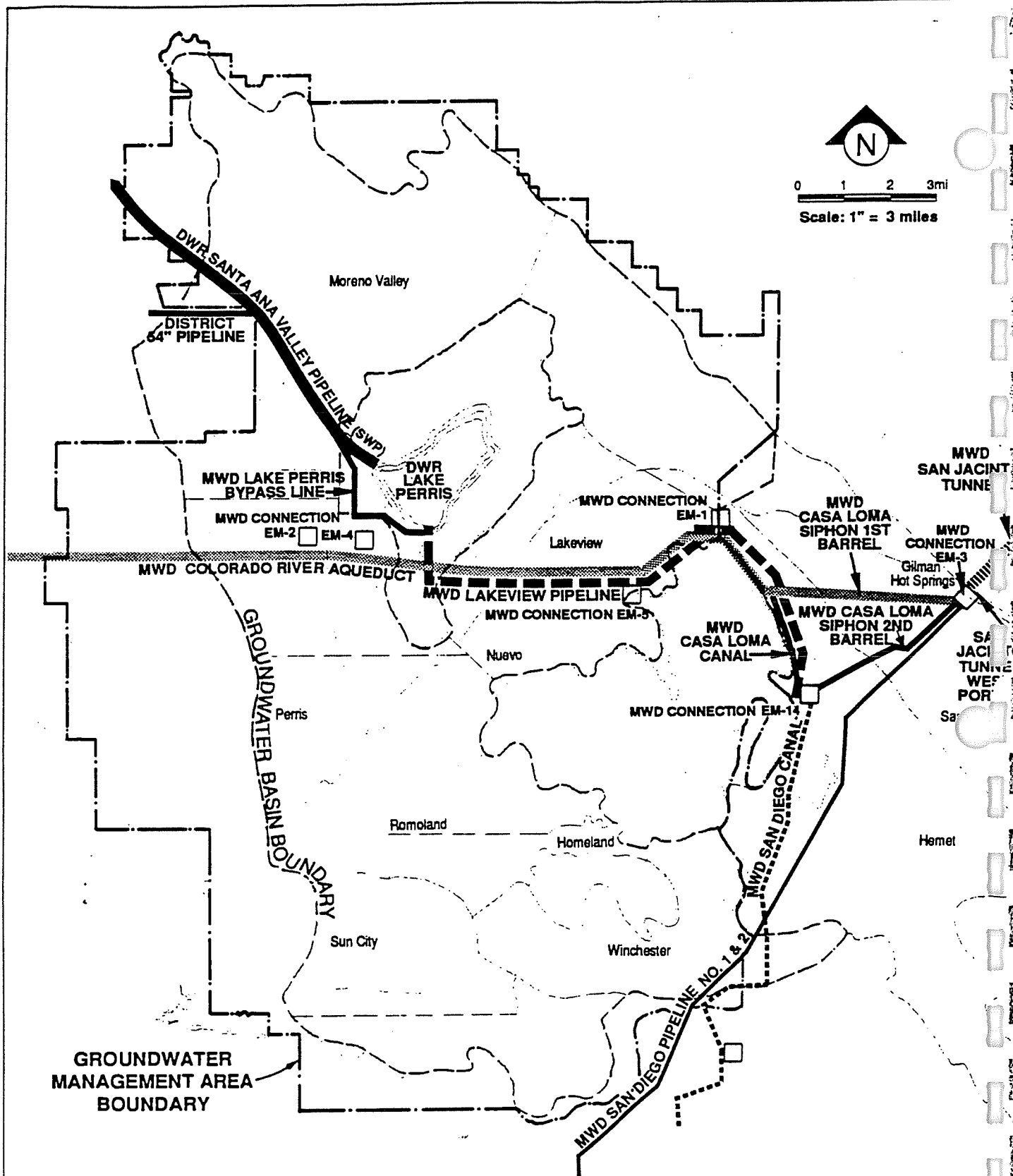


Figure 3-3
IMPORTED
WATER
FACILITIES

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EXISTING WATER RESOURCES FRAMEWORK

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

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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

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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."

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In carrying out this responsibility, the State Water Resources Control Board coordinates and oversees the activities of the nine Regional Boards. It has also adopted several statewide policies controlling specific aspects of water quality. These policies which apply to the Santa Ana River Water Reclamation Program include:

Nondegradation Policy (1968). This is the single most important statewide water quality 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". This policy requires that high quality water be maintained and protected unless: (1) allowing some degradation is clearly in the best interests of the people of California as a whole, (2) that any allowable degradation does not preclude an identified (present or future) beneficial use, and (3) that the applicable Basin Plan or some statewide policy takes note of the change in question and concedes that it is appropriate.

Reclamation Policy (1977). The "Policy and Action Plan for Water Reclamation in California" recognizes the present and future need for increased amounts of water in California, primarily to support growth. This policy commits both the State Board and the nine Regional Boards to support reclamation and reclamation projects which are consistent with sound principles and demonstrated needs.

California Regional Water Quality Control Board, Santa Ana Region

The California Regional Water Quality Control Board, Santa Ana Region, controls water quality within its region by adoption and implementation of a basinwide water quality control plan (Basin Plan) and waste discharge requirements for individual dischargers within its region. These two programs, as they relate to the West San Jacinto Groundwater Management Plan, are discussed in the following paragraphs.

Basin Plan. The Porter-Cologne Act directs each Regional Board to "...formulate and adopt water quality control plans for all areas within the region." A water quality control plan is defined as having three components: beneficial uses which are to be protected, water quality objectives which protect those uses, and an implementation plan which accomplishes the water quality objectives. For the Santa Ana Region, the original basin plan was adopted in 1975 and amended in 1983. As required, that plan is again being reviewed and updated where necessary.

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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

TABLE 3-3
SURFACE WATER QUALITY OBJECTIVES
(mg/l)

Water body	Total Dissolved Solids	Total Hardness	Sodium	Chloride	Total Inorganic Nitrogen	Sulfate	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

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					
Meniffee I	2000					
Meniffee 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

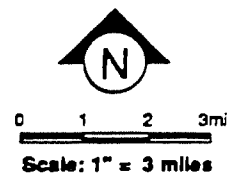
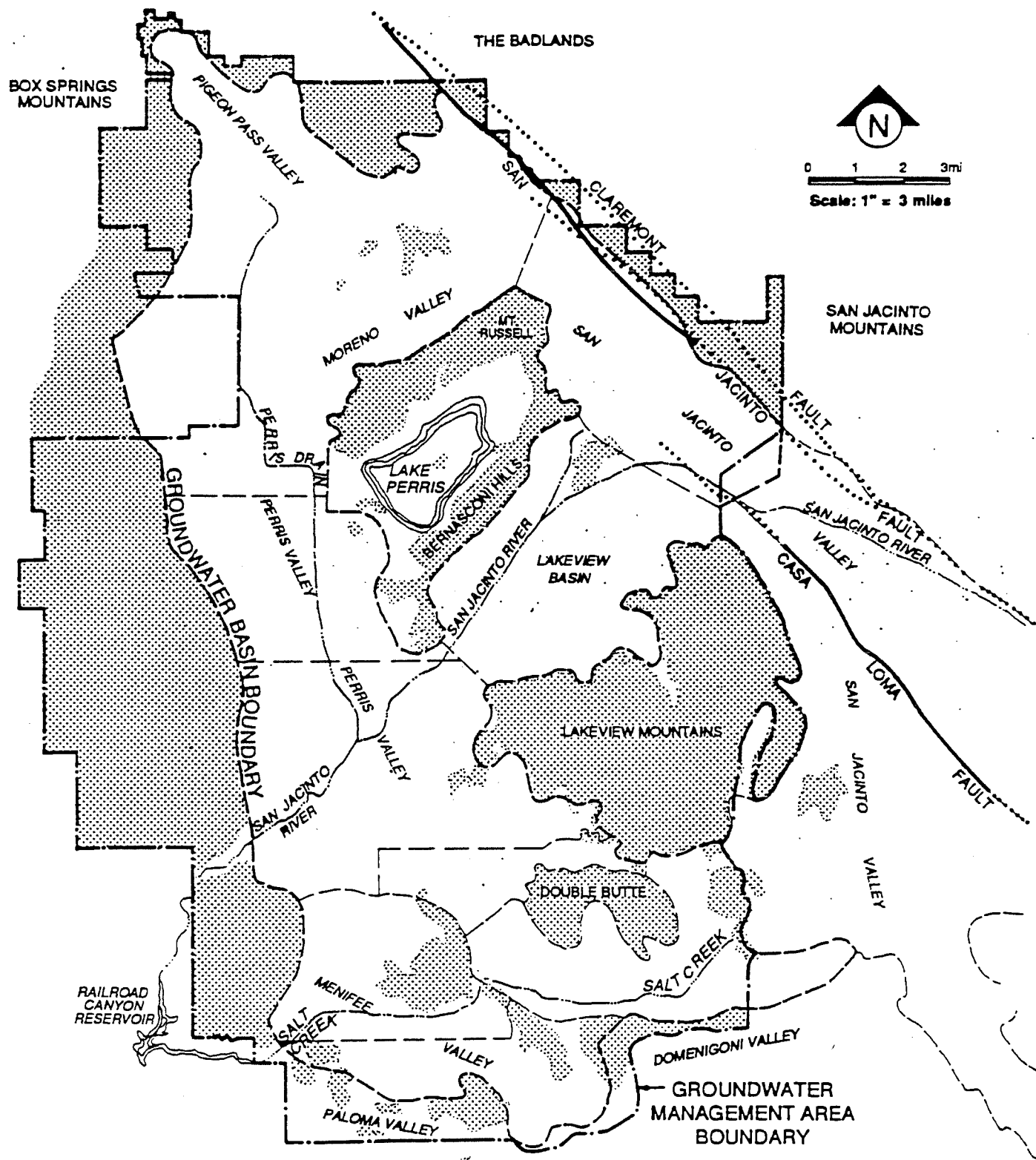
PHYSICAL FEATURES

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, Meniffee 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**

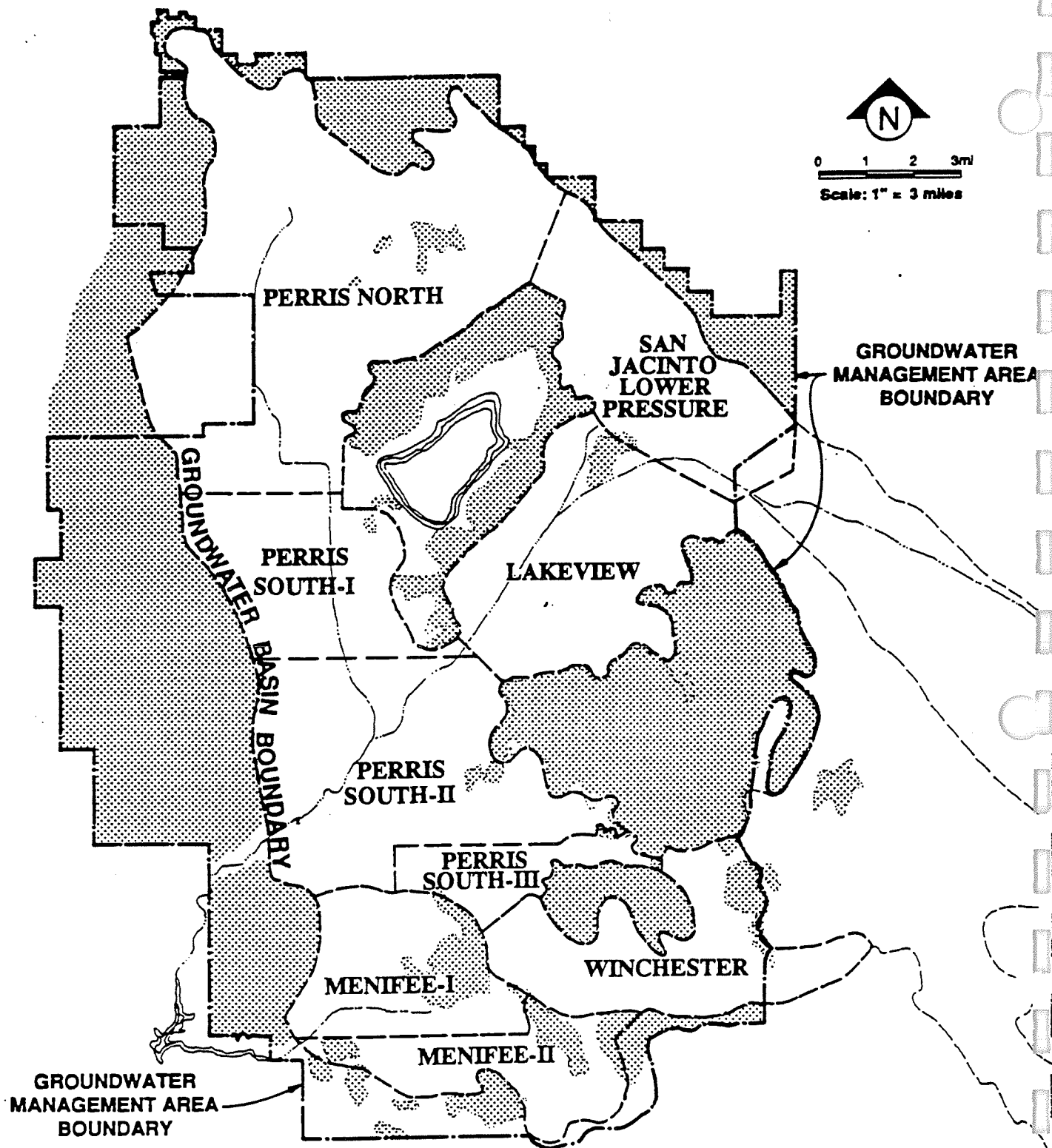


Figure 4-2
GROUNDWATER
SUBBASINS

SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

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
Menifec	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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GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

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 Meniffee Subbasins

The Meniffee basin has been subdivided into the Meniffee-I and Meniffee-II subbasins. As with the Perris subbasins, this division is based on water quality variations and has no hydrologic significance. The Meniffee-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 Meniffee-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Meniffee-II subbasin is bounded on the north by the Meniffee-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 Meniffee 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

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separate the Winchester subbasin from Domenigoni and Meniffee 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.

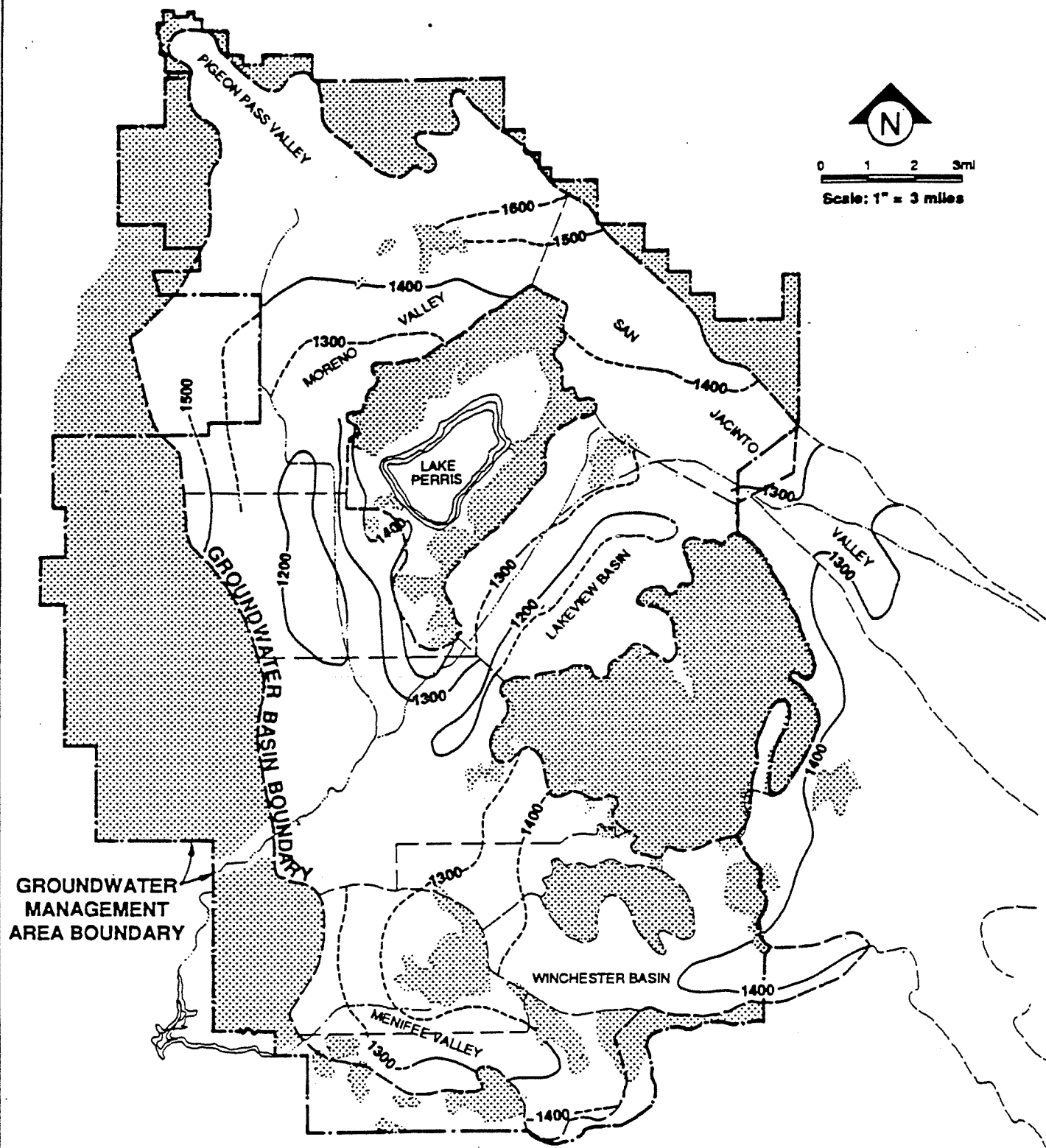
GROUNDWATER HYDROLOGY OF THE WEST SAN JACINTO BASIN

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**

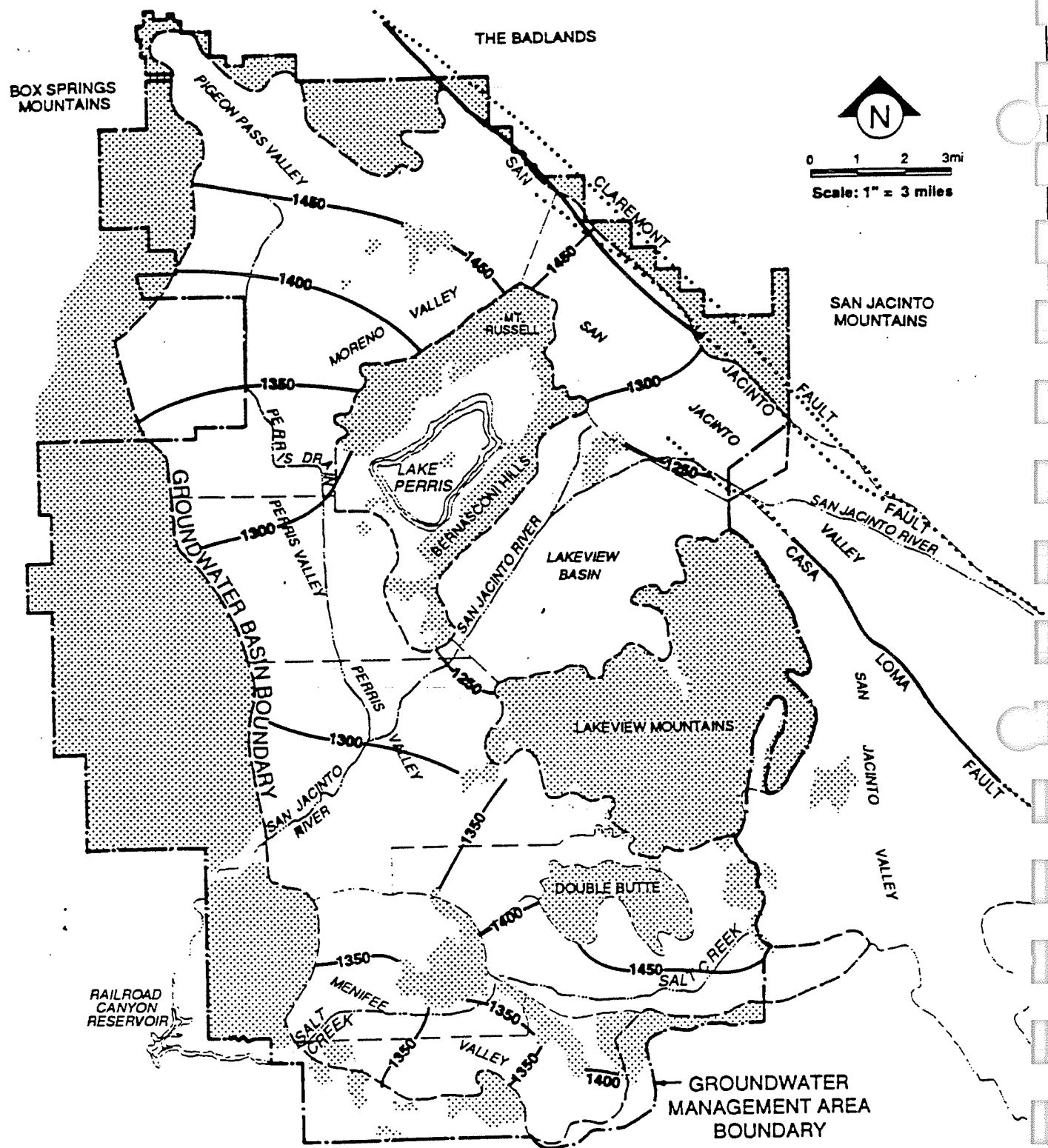


Figure 4-4
**GROUNDWATER
 ELEVATION MAP, 1993**

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South II subbasin, the remainder to a pumping depression in the Meniffee 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
Meniffee I	+50 feet
Meniffee II	+50 feet
Winchester	+25 to +50 feet
Lakeview	slightly less

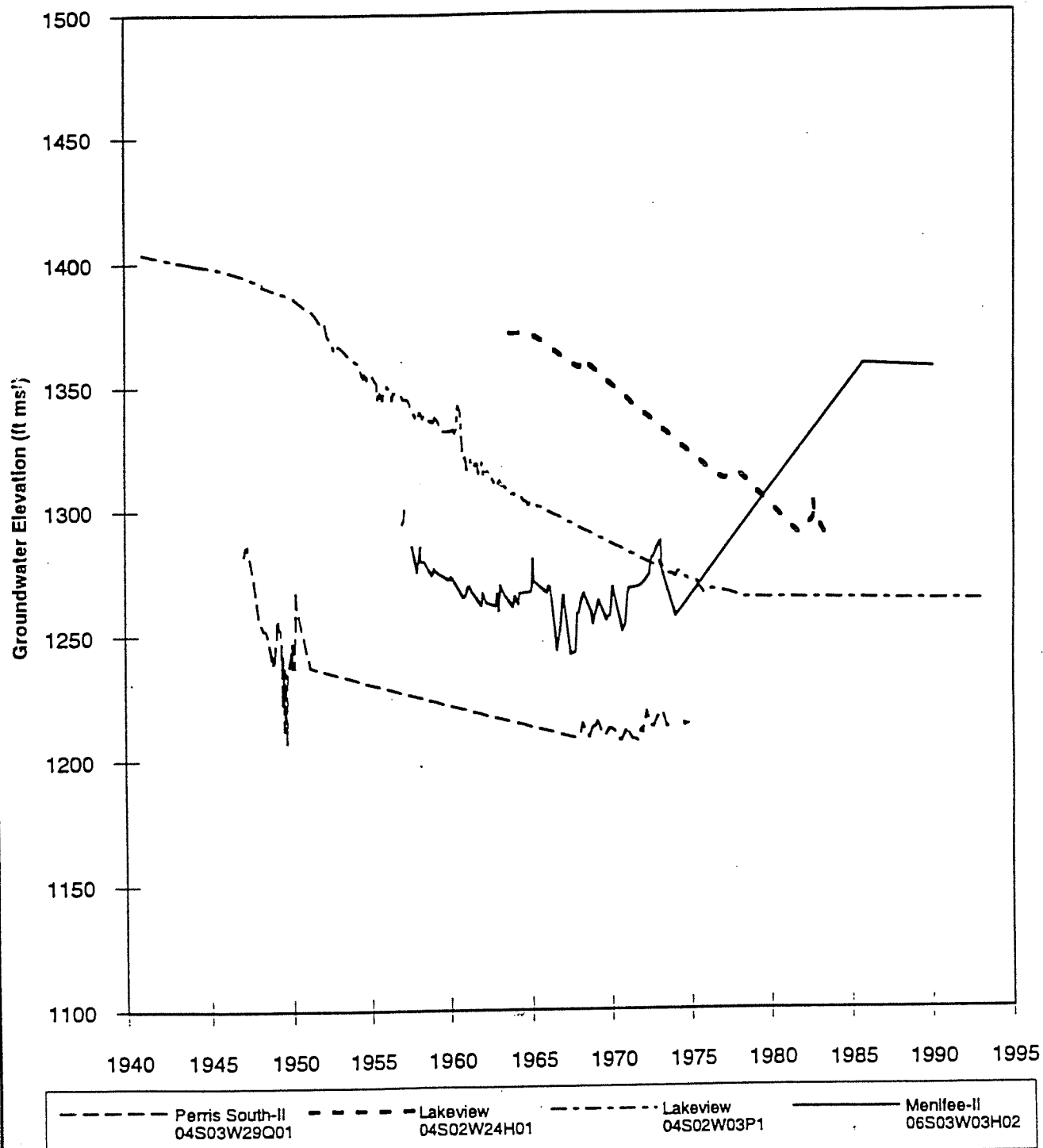
Generally, water levels will fluctuate both seasonally and on a long-term basis. Records of water levels in wells for the last 45 years generally indicate that the water table declined during the period of 1945 to the mid-seventies and recovered somewhat from the mid-1970's to the present. This long 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 Meniffee 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.

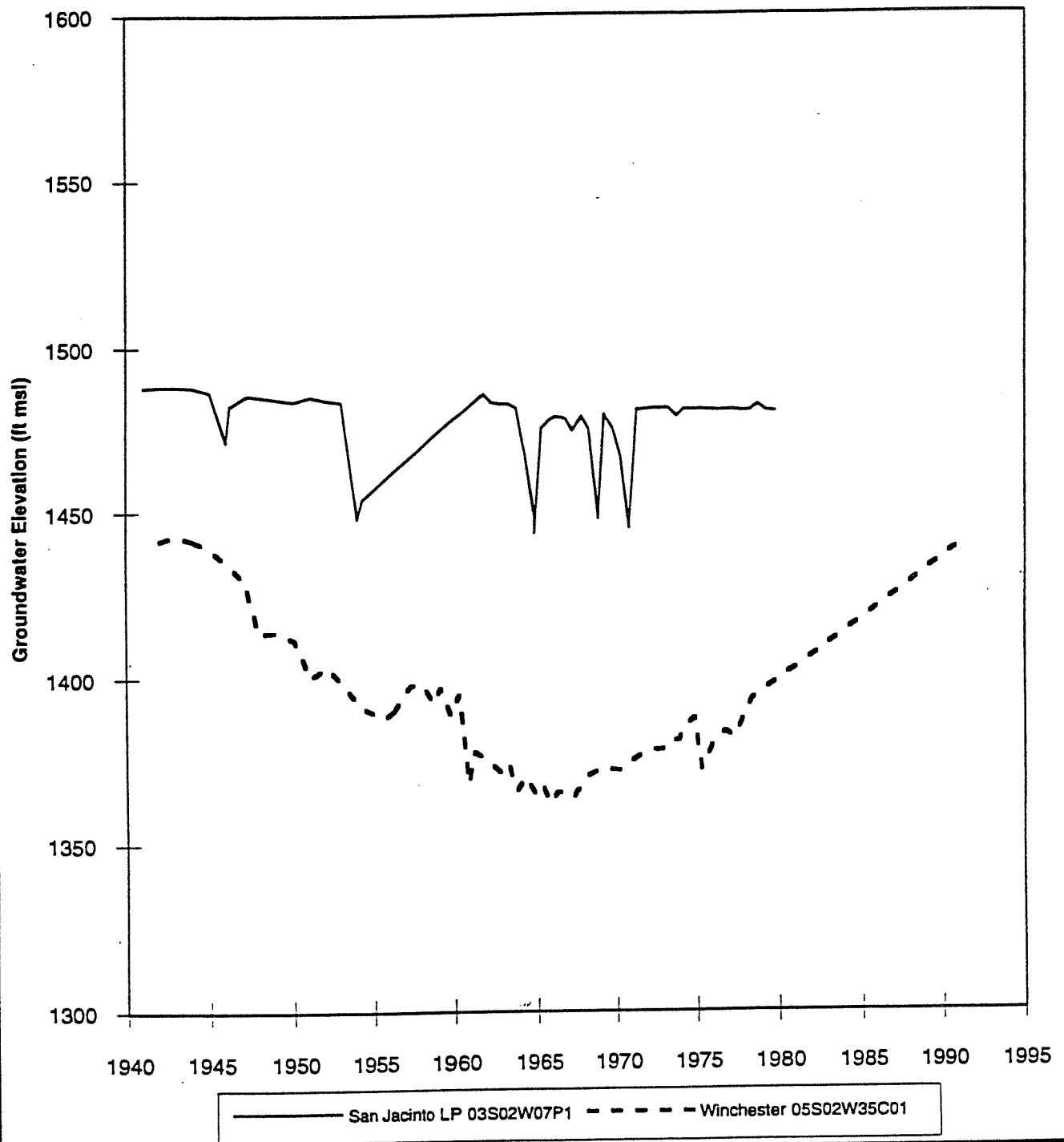
Groundwater Hydrology

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**



**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 Meniffee 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 Meniffee 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	
<i>Inflow Components</i>							
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
<i>Outflow Components</i>							
Subsurface Outflows to Outside of WSJ Area	0	0	0	0	800	1,200	2,000
	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
<i>Summary Statistics</i>							
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-ft/yr.

(2) Subtotal excludes subsurface flows between subbasins within the West San Jacinto Basin.

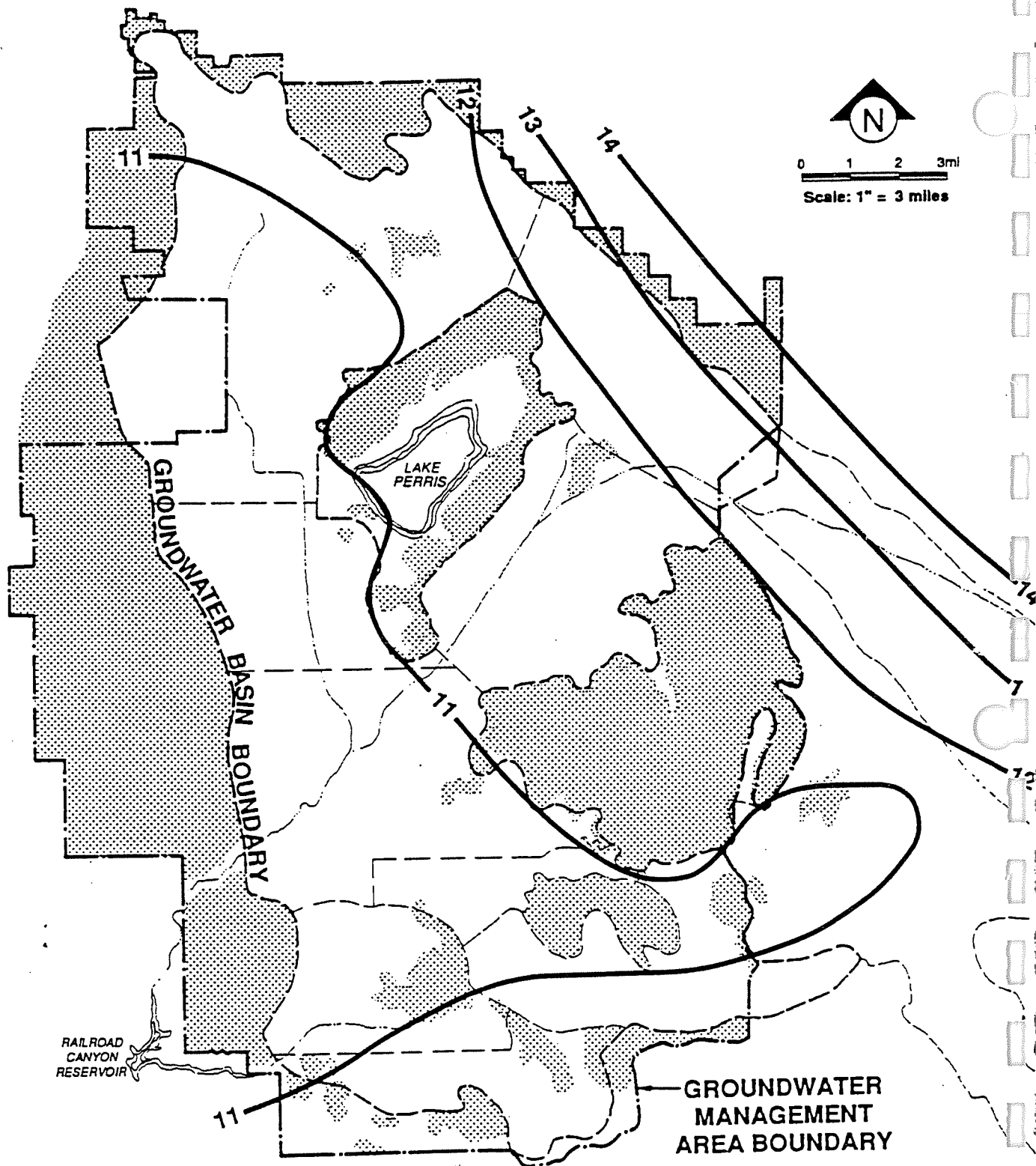


Figure 4-7
**AVERAGE ANNUAL PRECIPITATION
 GROUNDWATER MANAGEMENT AREA**

LEGEND:

NONWATER-BEARING PORTION

— 11 — EQUAL PRECIPITATION IN INCHES
 (Snowfall Converted to Equivalent Rainfall)

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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:

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- ☐ 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		
Moore	4S/2W 10C		600.3	792	653.4	428.1
Moore	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
Nutrilite	4S/2W 08Q	83	100.1	102.4	124.8	70
Nutrilite	4S/2W 08K	53.7	120.6	102.8	120	130
Nutrilite	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
Warrington	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						
Moore	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		13,721	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.

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GROUNDWATER RESOURCES IN THE WEST SAN JACINTO 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 Meniffee-I, Meniffee-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 Meniffee subbasins as part of EMWD's Meniffee 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.

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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).

<u>Subbasin</u>	<u>TDS</u>	<u>Nitrate (as N)</u>
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 4-10 TDS CONCENTRATION IN PERRIS NORTH AND SOUTH BASINS

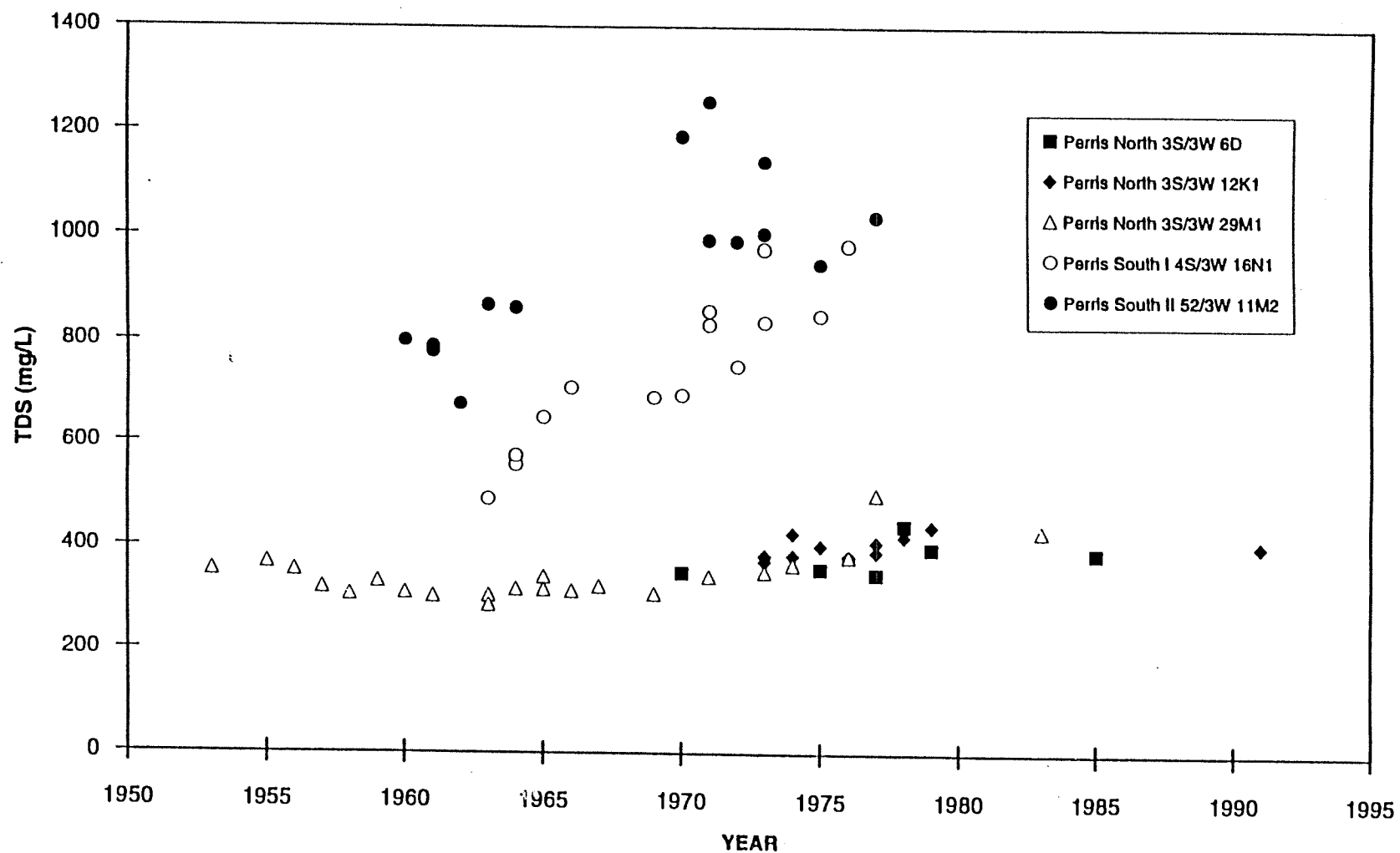


FIGURE 4-11 NITRATE-N CONCENTRATION PERRIS NORTH AND SOUTH BASINS

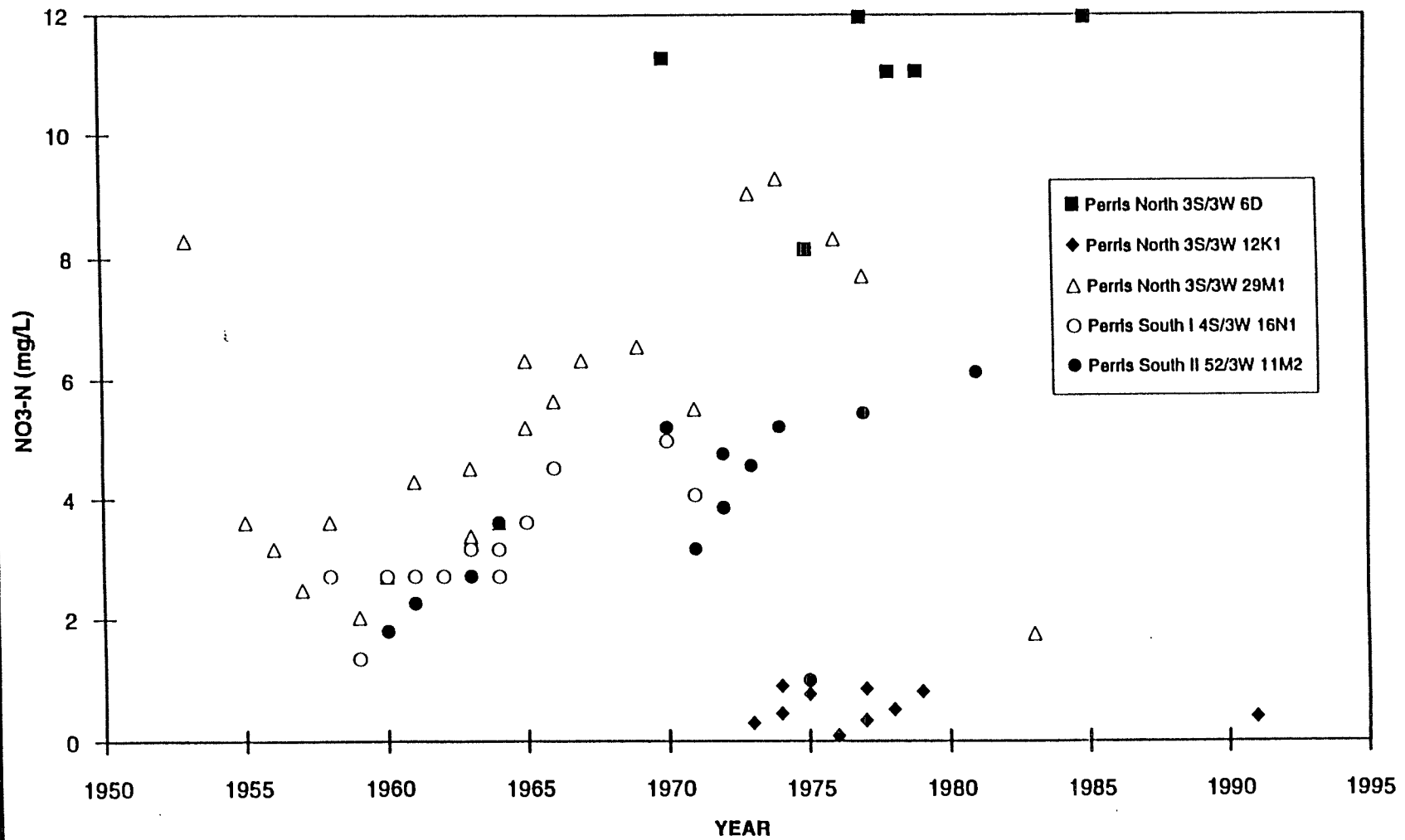
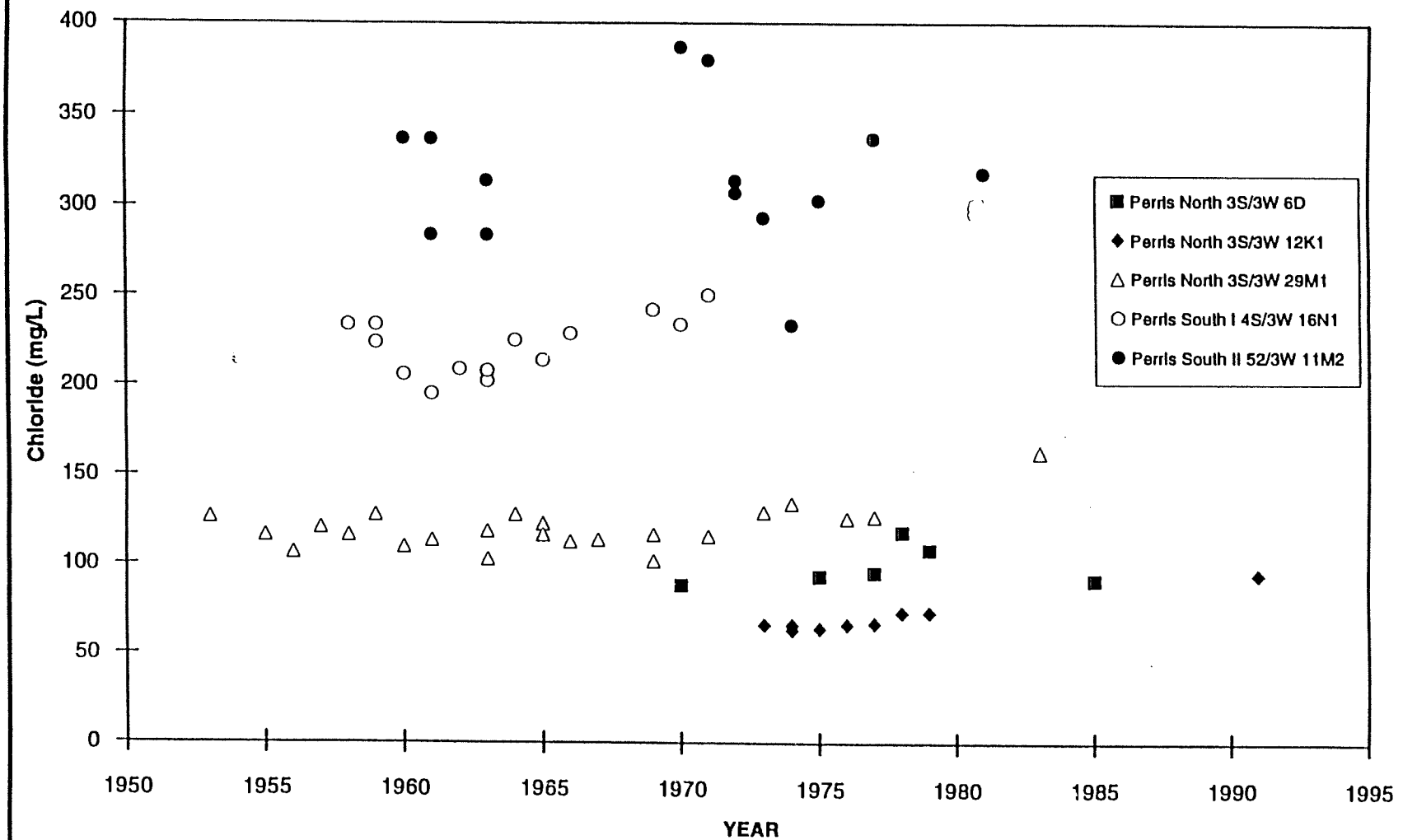
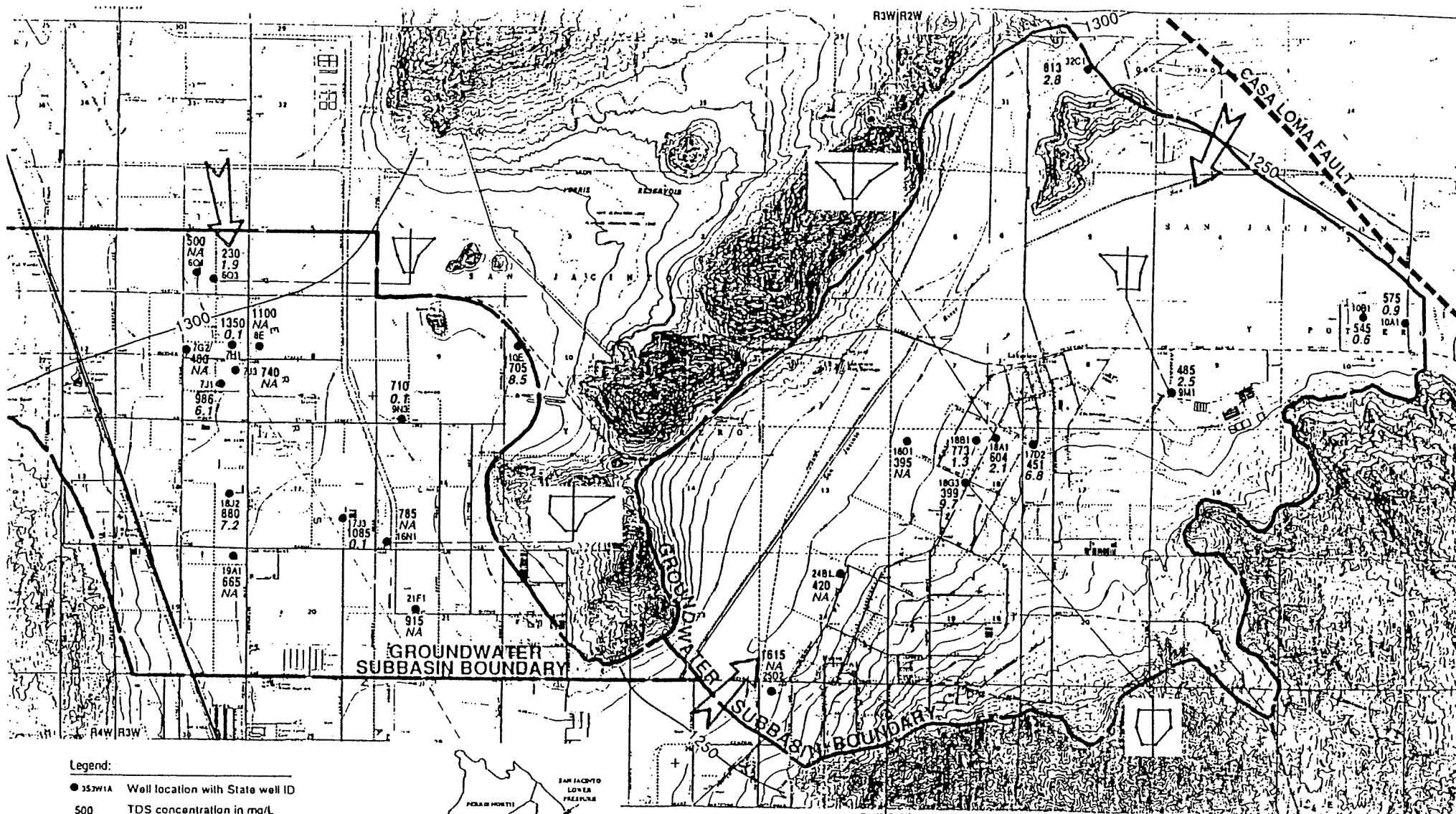
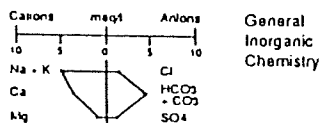


FIGURE 4-12 CHLORIDE CONCENTRATION PERRIS NORTH AND SOUTH BASINS





- Legend:
- 352W1A Well location with State well ID
 - 500 TDS concentration in mg/L
 - 5.0 NO₃ (Nitrate) concentration in mg/L as Nitrogen



— 1350 — Approximate location of Groundwater Contour

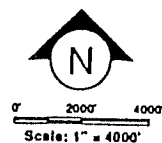
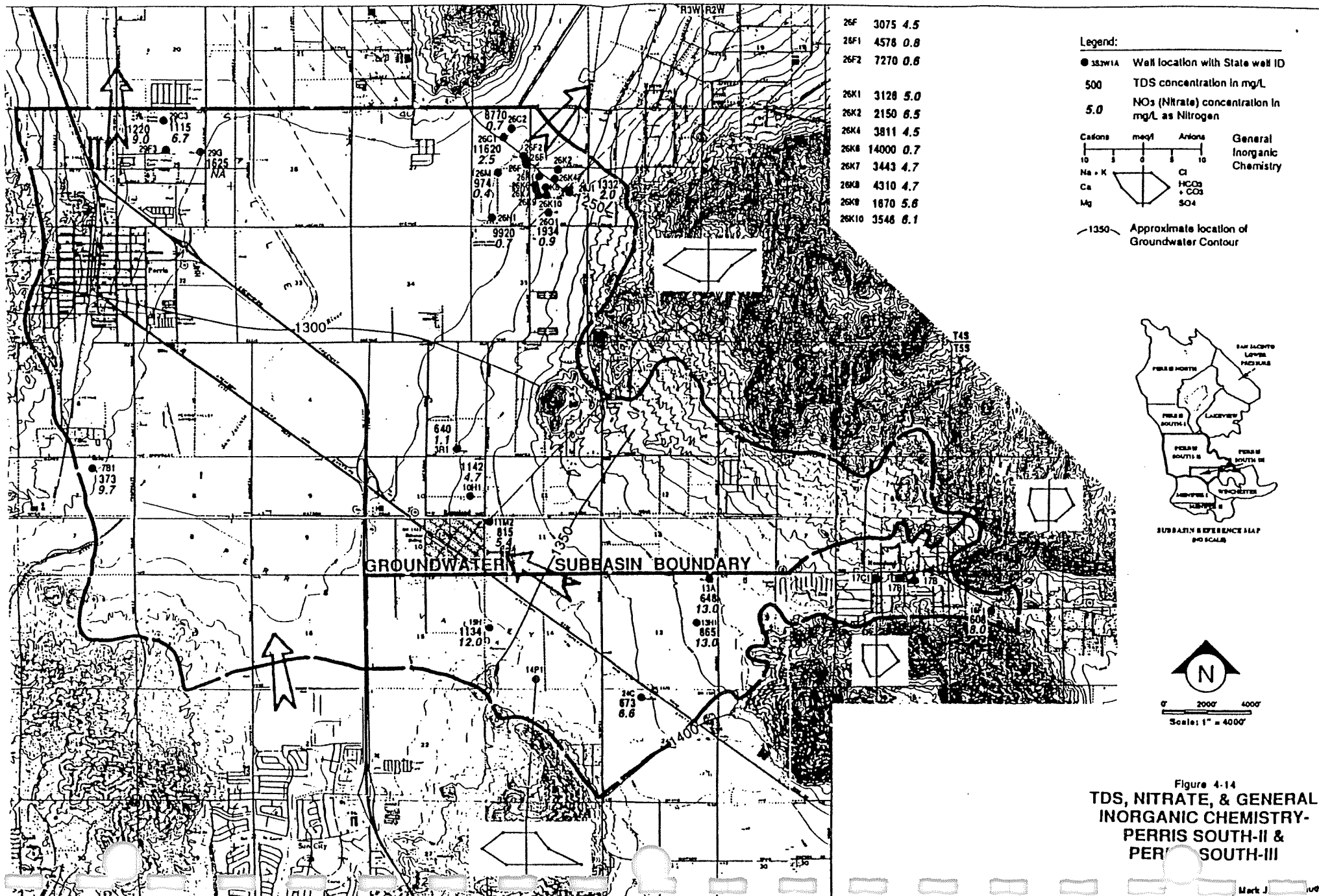


Figure 4-13
TDS, NITRATE, & GENERAL
INORGANIC CHEMISTRY-
PERRIS SOUTH-I & LAKEVIEW



SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

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.

SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

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

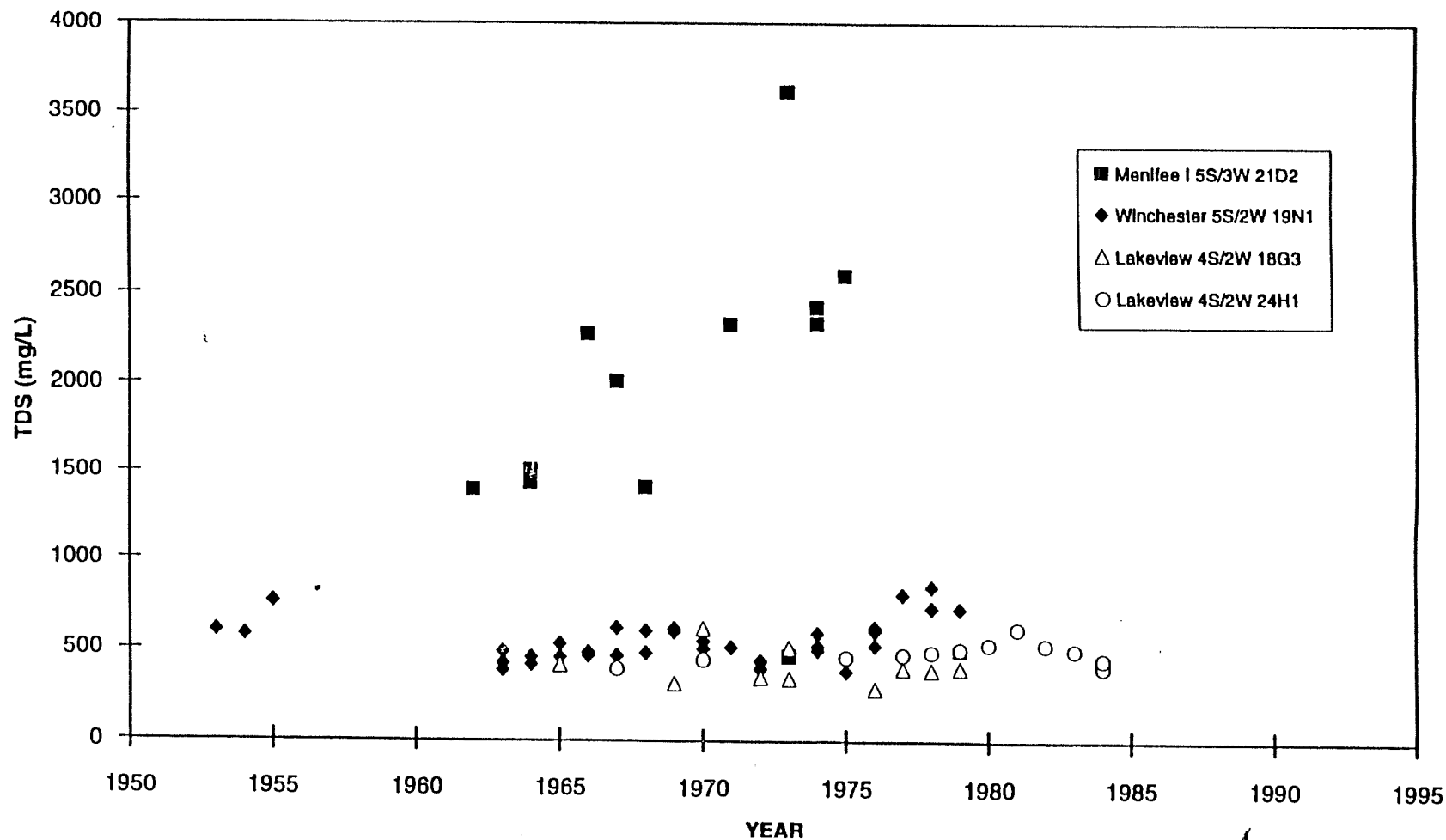


FIGURE 4-17 NITRATE-N CONCENTRATION MENIFEE I, WINCHESTER,
AND LAKEVIEW BASINS

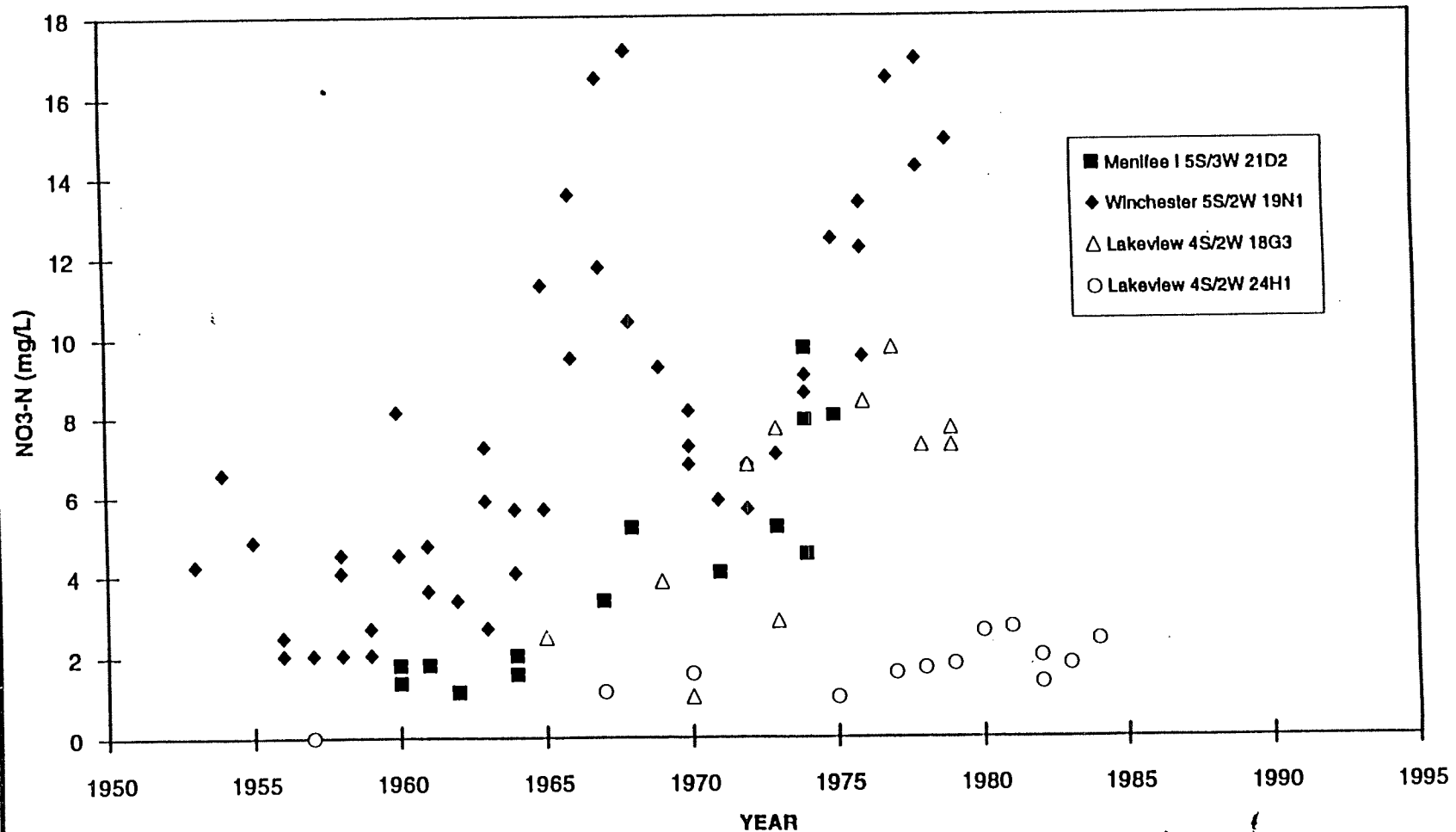
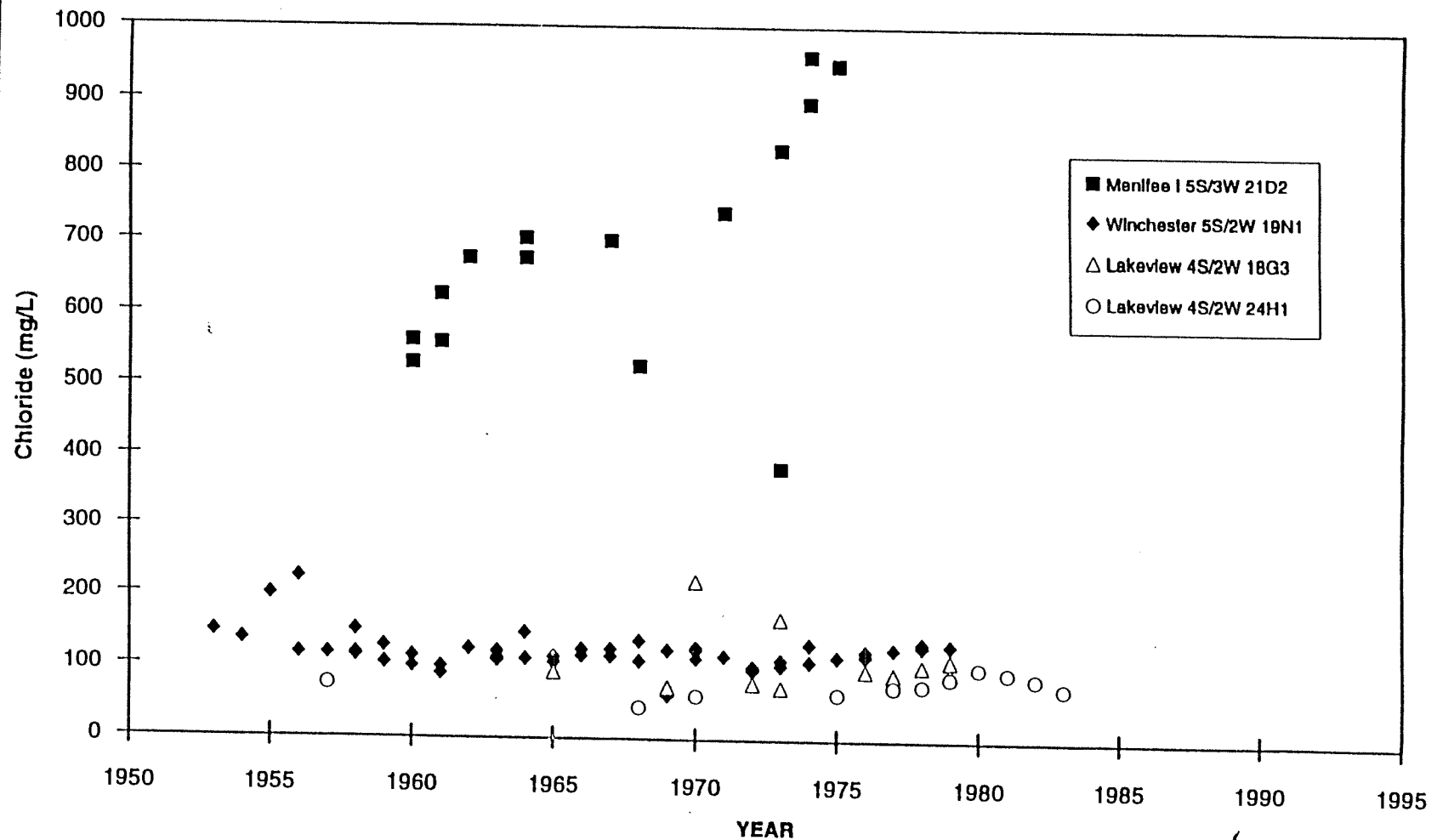


FIGURE 4-18 CHLORIDE CONCENTRATION IN MENIFEE, WINCHESTER, AND LAKEVIEW BASINS



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.

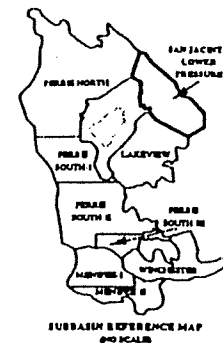
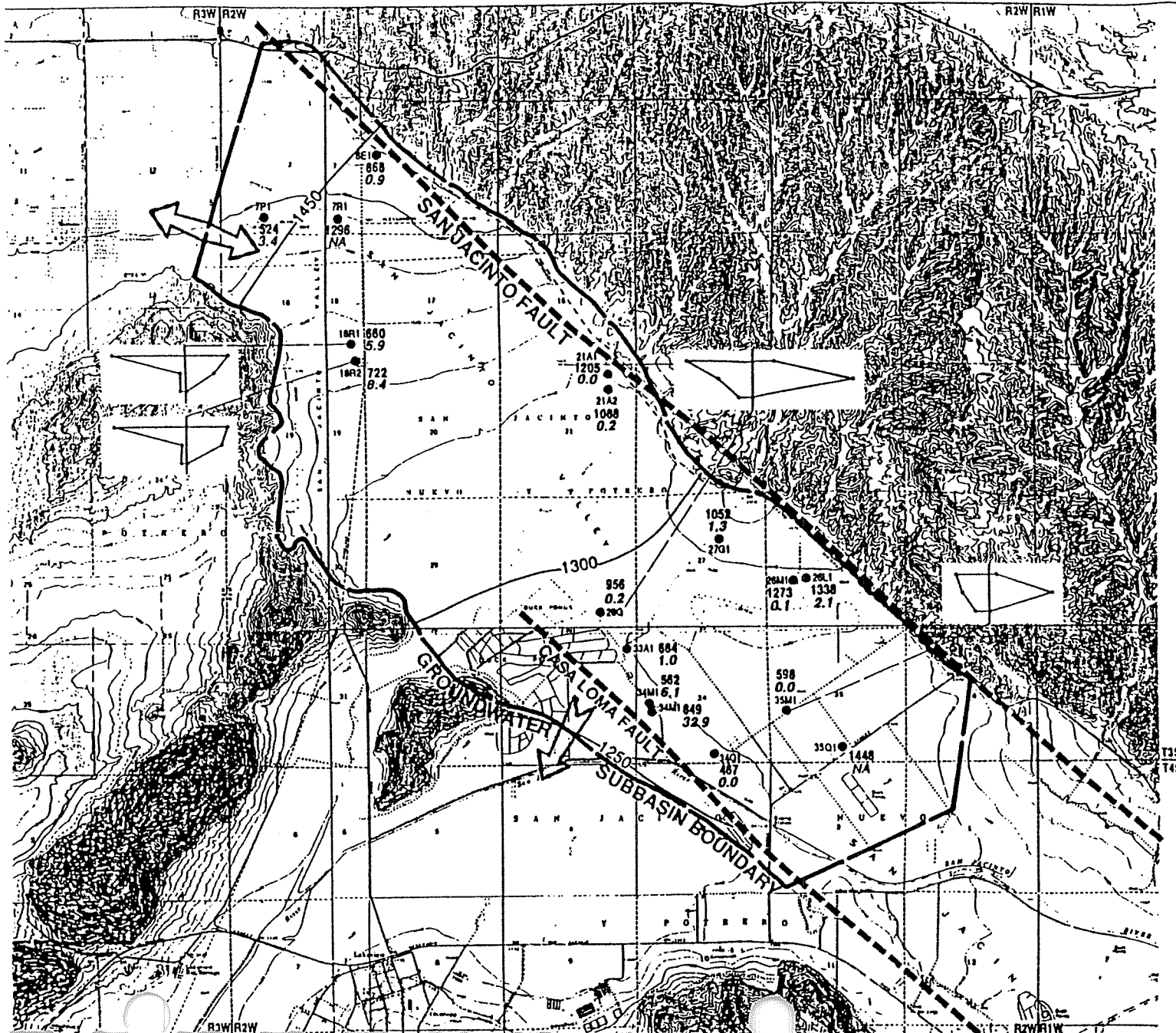
Under natural conditions, the primary source of recharge in the Winchester subbasin was subsurface inflow from the Hemet subbasin. The TDS in the subsurface inflow from the Hemet subbasin ranged from 500 to 1,000 mg/L. Currently, the Winchester subbasin flows into the Hemet subbasin causing groundwater 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

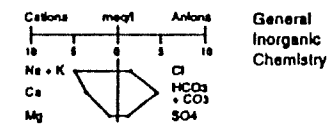
Figure 4-20 illustrates the TDS, nitrate and general inorganic chemistry of the San Jacinto Lower Pressure subbasin. Figure 4-20 is based on all available data and corresponds approximately to 1993 conditions. Water quality time histories could not be developed for this subbasin due to lack of data.

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.



Legend:

- 35241A Well location with State well ID
- 500 TDS concentration in mg/L
- 5.0 NO₃ (Nitrate) concentration in mg/L as Nitrogen



— 1350 — Approximate location of Groundwater Contour

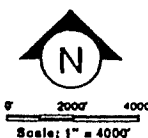


Figure 4-20
TDS, NITRATE, & GENERAL
INORGANIC CHEMISTRY-
SAN JACINTO LOWER PRESSURE

SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

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

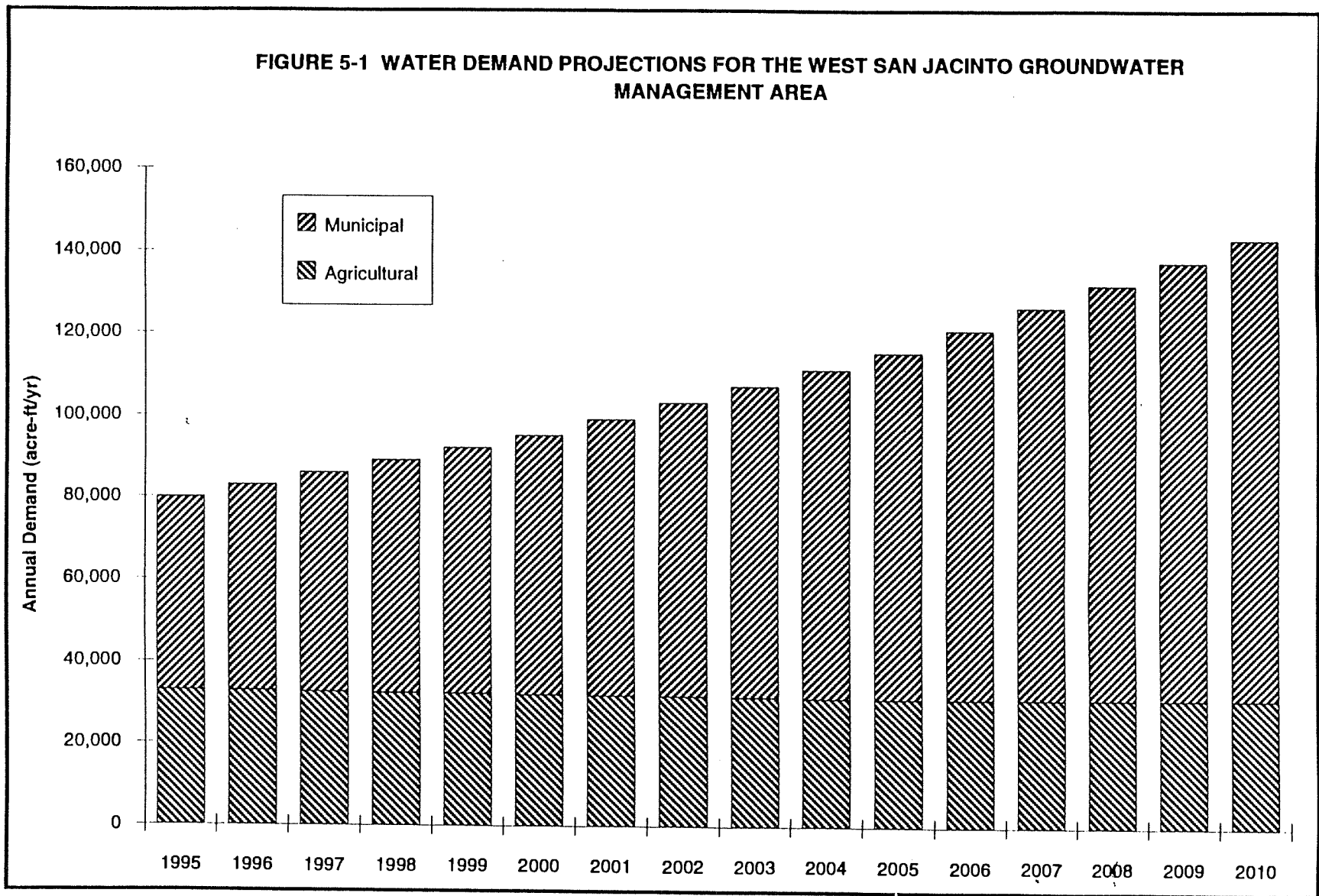
The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

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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FUTURE WATER DEMANDS AND WASTEWATER FLOWS

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.

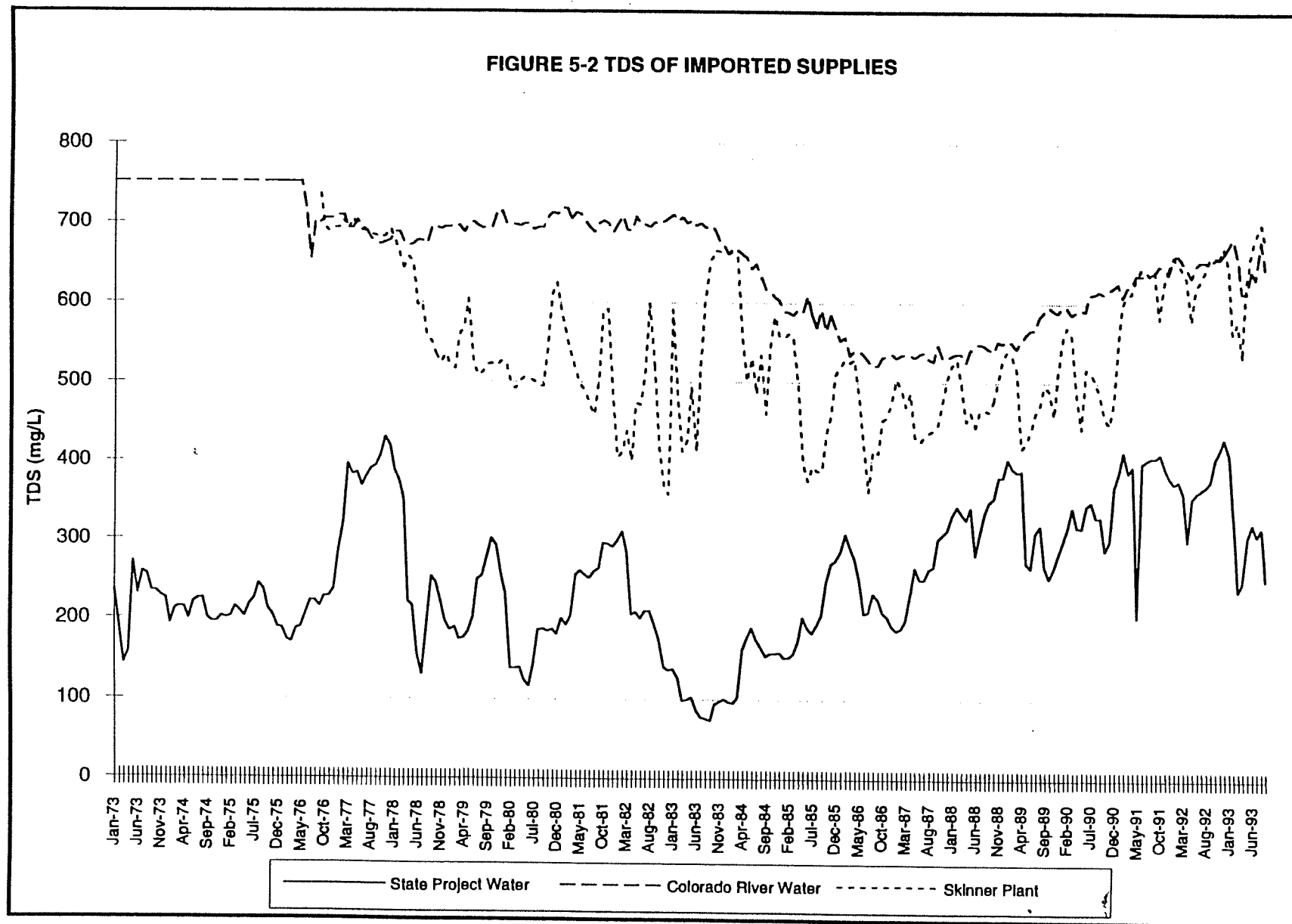


TABLE 5-2
METROPOLITAN WATER RATE PROJECTIONS

4/2/94

Year	Treatment Surcharge	Base Rate	Base Treated	Seasonal Storage (1)	
				Untreated	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

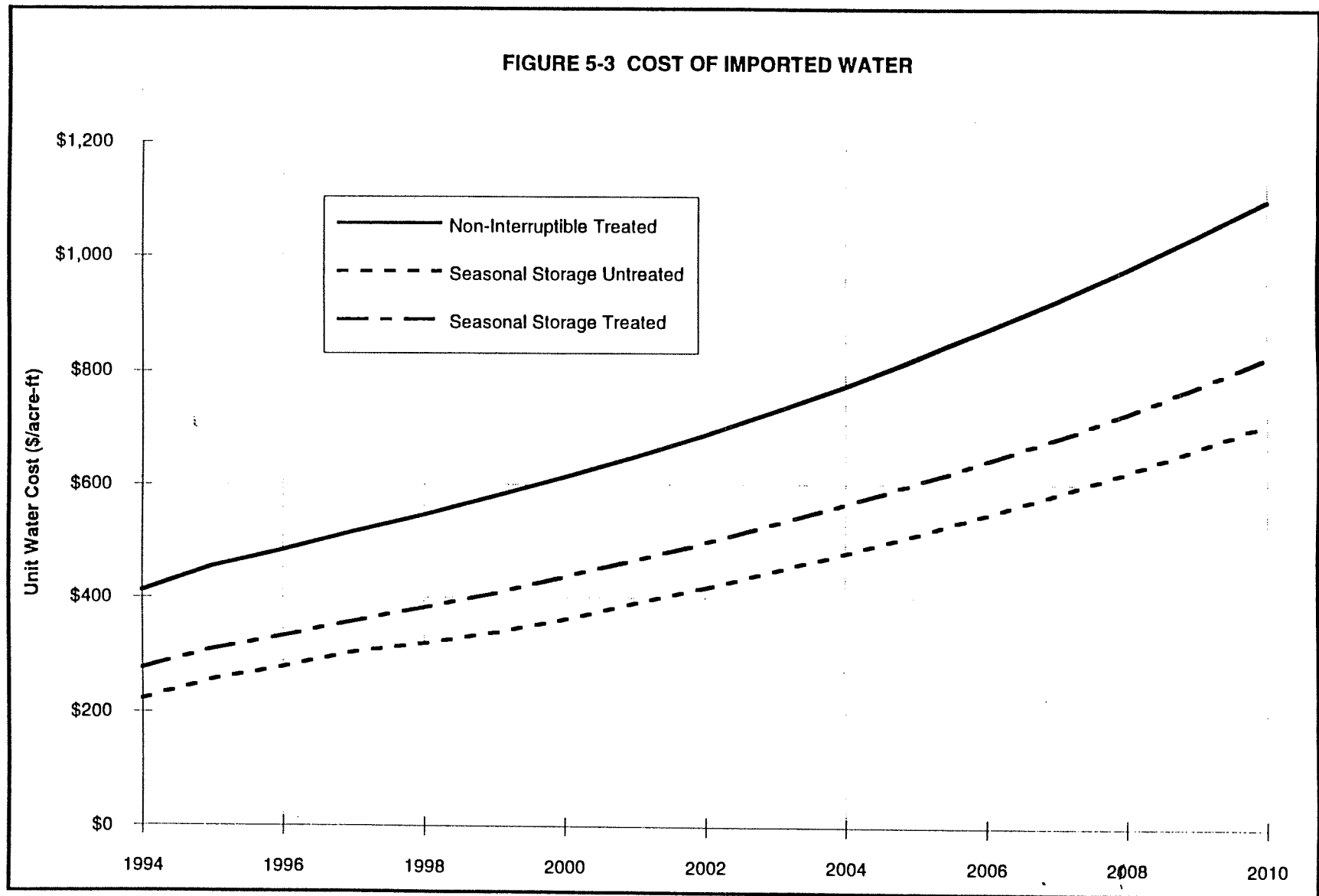


Figure 5-3
9/4/94

Mark J. Wildermuth
Water Resources Engineer

SECTION 5
FUTURE WATER DEMANDS AND WASTEWATER FLOWS

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, odor, 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	Storage Capacity	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield	Safe Yield with Wastewater Recharge	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration	Average Nitrate Concentration (as Nitrogen)
	(acre-ft)	(acre-ft)		(acre-ft/yr)	(acre-ft/yr)		(mg/L)	(mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	430	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
Menifec	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

SECTION 5
FUTURE WATER DEMANDS AND WASTEWATER FLOWS

if blended with SWP water. Groundwater from the Meniffee-I, Meniffee-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 Meniffee 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 Meniffee-I and Meniffee-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

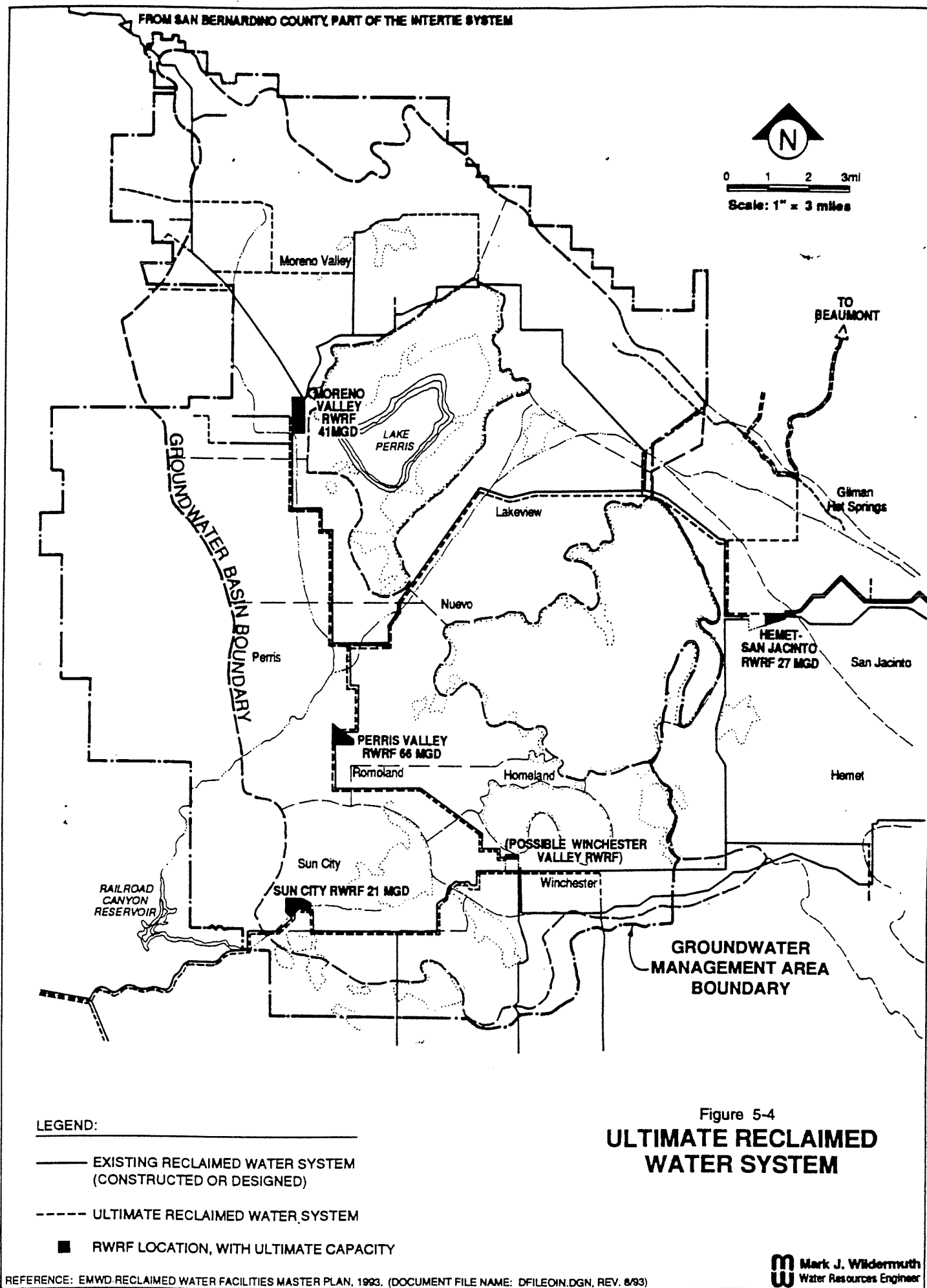


TABLE 5-4
PROJECTED RECLAIMED WATER FLOWS
 (acre-ft/yr)

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.

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FUTURE WATER DEMANDS AND WASTEWATER FLOWS

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
<u>Municipal Demand</u>	<u>47,000</u>	<u>100%</u>	<u>63,000</u>	<u>100%</u>	<u>84,000</u>	<u>100%</u>	<u>112,000</u>	<u>100%</u>
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Meniffee 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%
<u>Agricultural Demand</u>	<u>33,000</u>	<u>100%</u>	<u>32,000</u>	<u>100%</u>	<u>31,000</u>	<u>100%</u>	<u>31,000</u>	<u>100%</u>
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%
<u>Total Demand</u>	<u>80,000</u>	<u>100%</u>	<u>95,000</u>	<u>100%</u>	<u>115,000</u>	<u>100%</u>	<u>143,000</u>	<u>100%</u>
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Meniffee 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 Meniffee desalter will be about 4,200 acre-ft/yr with 3,360 acre-ft/yr of potable water and 1,840 acre-ft/yr.

**TABLE 5-6
COST OF WATER SUPPLY FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
WITHOUT A GROUNDWATER MANAGEMENT PLAN**

Year	Demand	Imported Water		Reclaimed Water		Groundwater												Total Cost of Groundwater Production (\$)	Total Cost (\$)	Composite Unit Cost of Supply (\$/acre-ft)
		Volume (acre-ft/yr)	Rate (\$/acre-ft)	Cost (\$)	Volume (acre-ft/yr)	Rate (\$/acre-ft)	Cost (\$)	Municipal Use			Agricultural Use			Municipal Use						
								Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost				
																	Desalter			
(acre-ft/yr)	(acre-ft/yr)	(\$/acre-ft)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)	(\$/acre-ft/yr)			
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	\$1,770,395	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	\$4,231,296	\$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	\$97,310,890	\$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	\$108,359,835	\$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																				
																			\$156,663,649.25	

Table 5-6
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Water Resources Engr

SECTION 5
FUTURE WATER DEMANDS AND WASTEWATER FLOWS

Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Meniffee Desalter	3%	4%
Groundwater	23%	3%

The most expensive water in the supply plan is Meniffee 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.

SECTION 6
GROUNDWATER MANAGEMENT GOALS

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.

**SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN**

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 consistent 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.

SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

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 Meniffee 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 Meniffee 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

SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

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.

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SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

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, Meniffee I, Meniffee 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.

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ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

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

SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

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, Meniffee 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

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ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

- ☐ 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	Morreno 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	Perris Valley	825	1,000	575	1.3	1.5
Lower Pressure						

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 sewerred to a new reclamation plant in Winchester area or sewerred 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	Subbasin					
	Lakeview	Meniffee	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 Meniffee desalter (Black & Veatch, 1993). The 1995 cost to produce water from the Meniffee 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 Meniffee 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 Meniffee 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	----- Meniffee 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)					
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

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	Meniffee	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

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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

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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.

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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 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

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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.

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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.

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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 policies 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.

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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

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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.

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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

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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	Imported Water															Agricultural Groundwater															Municipal Use of Groundwater															Total Groundwater Usage (acre-ft/yr)	Total Cost (\$)	Composite Unit Cost (\$/acre-ft)
	Demand (acre-ft/yr)	Treated Base Water		Imported Volume (acre-ft)	Total Imported Cost (\$)	Direct Use (acre-ft/yr)	Rate (\$/acre-ft)	Total Recl. Water Use (acre-ft/yr)	Cost (\$)	Volume (acre-ft)	Rate (\$/acre-ft)	Cost (\$)	Desalination		Direct Municipal Use		Volume (acre-ft/yr)	Blending Rate (\$/acre-ft)	Cost (\$)	Total Mun. Use of Groundwater (acre-ft/yr)																												
		Direct Use (acre-ft/yr)	Blending (acre-ft/yr)										Volume (acre-ft/yr)	Rate (\$/acre-ft)	Volume (acre-ft/yr)	Rate (\$/acre-ft)					Volume (acre-ft/yr)	Rate (\$/acre-ft)																										
1995	80,200	44,500	0	\$434	44,500	\$20,203,000	8,900	\$43	8,900	\$560,700	24,100	\$43	\$1,518,300	0	\$0	2,300	\$68	0	\$68	\$170,000	2,300	24,600	\$22,432,000	\$281																								
1996	83,000	47,300	0	\$483	47,300	\$22,845,900	10,849	\$66	10,849	\$710,824	22,351	\$66	\$1,464,438	0	\$0	2,300	\$71	0	\$71	\$176,800	2,300	24,851	\$25,197,964	\$304																								
1997	86,000	46,740	0	\$515	46,740	\$24,071,100	12,798	\$68	12,798	\$472,064	20,602	\$68	\$1,403,837	3,360	\$576	2,300	\$74	0	\$74	\$2,119,232	3,860	24,462	\$28,466,235	\$331																								
1998	89,000	49,540	0	\$545	49,540	\$26,999,300	14,747	\$71	14,747	\$1,045,047	18,833	\$71	\$1,334,043	3,360	\$592	2,300	\$76	0	\$76	\$2,180,347	5,860	24,713	\$31,560,759	\$355																								
1999	92,000	33,604	5,300	\$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	34,200	\$28,391,254	\$309																								
2000	95,000	34,655	5,300	\$613	40,155	\$24,415,015	18,645	\$77	18,645	\$1,429,123	15,355	\$77	\$1,176,947	3,360	\$627	10,385	\$83	7,100	\$83	\$3,553,294	20,845	34,200	\$30,774,381	\$324																								
2001	99,000	36,706	5,300	\$649	42,206	\$27,391,694	20,394	\$80	20,394	\$1,641,653	13,606	\$80	\$1,084,604	3,360	\$649	12,154	\$86	7,100	\$86	\$3,835,566	22,594	34,200	\$33,953,516	\$343																								
2002	103,000	38,757	5,300	\$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	34,200	\$37,490,013	\$364																								
2003	107,000	40,808	5,300	\$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	34,200	\$41,356,348	\$387																								
2004	111,000	42,859	5,300	\$773	48,359	\$37,381,507	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	34,200	\$45,468,654	\$410																								
2005	115,000	44,910	5,300	\$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	\$5,395,422	29,590	34,200	\$49,995,362	\$435																								
2006	120,600	50,310	5,300	\$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	34,200	\$53,578,455	\$477																								
2007	126,200	55,710	5,300	\$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	34,200	\$56,895,237	\$522																								
2008	131,800	61,110	5,300	\$976	66,610	\$63,011,360	28,990	\$105	28,990	\$3,041,040	6,610	\$105	\$693,387	3,360	\$974	19,130	\$113	7,100	\$113	\$6,249,229	29,590	34,200	\$60,000,000	\$569																								
2009	137,400	66,310	5,300	\$1,035	72,010	\$74,530,350	29,190	\$109	29,190	\$3,184,301	6,610	\$109	\$721,122	3,360	\$1,035	19,130	\$118	7,100	\$118	\$6,566,287	29,590	34,200	\$63,000,000	\$619																								
2010	143,200	71,910	5,300	\$1,097	77,410	\$84,918,770	29,390	\$113	29,390	\$3,334,573	6,610	\$113	\$749,947	3,360	\$1,085	19,130	\$122	7,100	\$122	\$6,837,835	29,590	34,200	\$65,841,145	\$670																								
Total Volume	1,719,000	765,929	66,000		831,929		350,043			201,933			47,040			202,831		85,200		335,071		337,026																										
Fraction of Total		45%	4%				20%			12%			3%			12%		5%																														
Total Cost					\$641,033,284				\$31,723,830		\$15,937,480									\$65,742,269																												
Fraction of Total					85%				4%		2%									9%																												
Percent Value																																																
																							\$449,025,159																									

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	Imported Water																			Agricultural Groundwater										Municipal Use of Groundwater										Total Groundwater Usage (ac-ft/yr)	Total Cost (\$)	Composite Unit Cost (\$/ac-ft)
	Treated Base Water				Total Imported Volume (ac-ft/yr)	Imported Cost (\$)	Retained Water				Cost (\$)	Volume (ac-ft/yr)	Rate (\$/ac-ft)	Cost (\$)	Demineralization		Direct Municipal Use		Blending		Municipal Cost (\$)	Total Mun. Use of Groundwater (ac-ft/yr)																				
	Demand (ac-ft/yr)	Direct Use (ac-ft/yr)	Blending (ac-ft/yr)	Rate (\$/ac-ft)			Direct Use (ac-ft/yr)	Rate (\$/ac-ft)	Total Retd. Water Use (ac-ft/yr)	Volume (ac-ft/yr)					Rate (\$/ac-ft)	Volume (ac-ft/yr)	Rate (\$/ac-ft)	Volume (ac-ft/yr)	Rate (\$/ac-ft)	Volume (ac-ft/yr)			Rate (\$/ac-ft)																			
1995	80,000	44,500	0	\$454	44,500	\$20,203,000	8,900	\$63	8,900	\$560,700	24,100	\$63	\$1,318,300	0	\$0	2,300	\$68	0	\$68	\$170,000	2,300	36,600	\$23,452,000	\$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	2,300	\$71	0	\$71	\$176,800	2,300	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	2,300	\$74	0	\$74	\$2,119,232	5,660	23,622	\$28,466,235	\$331																		
1998	89,000	49,540	0	\$545	49,540	\$26,999,300	16,007	\$71	16,007	\$1,134,339	17,593	\$71	\$1,246,753	3,360	\$592	2,300	\$76	0	\$76	\$2,180,347	5,660	23,453	\$31,560,759	\$355																		
1999	92,000	51,924	5,500	\$578	57,424	\$21,631,072	18,376	\$74	18,376	\$1,354,331	15,424	\$74	\$1,136,764	7,540	\$609	4,136	\$80	7,100	\$80	\$5,644,789	20,776	36,200	\$29,766,938	\$334																		
2000	95,000	52,355	5,500	\$613	58,855	\$23,327,715	20,745	\$77	20,745	\$1,590,086	13,255	\$77	\$1,015,584	7,540	\$617	8,305	\$83	7,100	\$83	\$6,002,073	22,945	36,200	\$31,935,858	\$336																		
2001	99,000	54,186	5,500	\$649	59,686	\$25,756,214	23,114	\$80	23,114	\$1,842,535	11,066	\$80	\$883,722	7,540	\$649	10,474	\$86	7,100	\$86	\$6,405,557	25,114	36,200	\$34,888,027	\$352																		
2002	103,000	55,817	5,500	\$688	61,317	\$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	\$6,954,190	27,283	36,200	\$38,232,173	\$371																		
2003	107,000	57,448	5,500	\$730	62,948	\$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	\$7,543,390	29,452	36,200	\$41,878,637	\$391																		
2004	111,000	59,079	5,500	\$773	64,579	\$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	\$8,159,104	31,621	36,200	\$45,739,140	\$412																		
2005	115,000	60,710	5,500	\$820	66,210	\$37,897,300	32,590	\$93	32,590	\$3,039,193	2,410	\$93	\$224,745	7,540	\$820	19,150	\$101	7,100	\$101	\$8,825,036	33,790	36,200	\$49,981,175	\$435																		
2006	120,600	66,110	5,500	\$869	71,610	\$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	71,510	5,500	\$921	77,010	\$52,506,210	32,990	\$101	32,990	\$3,377,537	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	76,910	5,500	\$976	82,410	\$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	82,310	5,500	\$1,035	87,810	\$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	87,710	5,500	\$1,097	93,210	\$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	724,349	66,000		790,349		394,145			157,835			97,300			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		\$739,294,301																				
Fraction of Total					80%					5%			2%							14%																						
Present Value																							\$492,553,506																			

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						Total		Reclaimed Water				Agricultural Groundwater				Municipal Use of Groundwater								Total Groundwater Usage	Total Cost	Composite Unit Cost
			Treated Base Water		Untr. Seasonal Water																								
	Direct Use	Blending	Rate	Conj. Use	Rate	Imported Volume	Imported Cost	Direct Use	Rate	Conj. Use	Rate	Total Recl. Water Use	Cost	Volume	Rate	Cost	Demineralization Volume	Rate	Direct + Conj. Use	Blending	Cost	Total Mun. Use of Groundwater							
	(acre-fts)	(acre-fts)	(acre-fts)	(\$/acre-ft)	(acre-fts)	(\$/acre-ft)	(\$)	(acre-fts)	(\$/acre-ft)	(acre-fts)	(\$/acre-ft)	(acre-fts)	(\$)	(ft ³)	(acre-fts)	(\$/acre-ft)	(ft ³)	(acre-fts)	(\$/acre-ft)	(acre-fts)	(\$/acre-ft)	(acre-fts)	(acre-fts)						
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	1,500	\$68	0	\$68	\$170,000	2,500	16,600	\$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	14,431	\$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	\$1,246,733	3,360	\$591	2,500	\$76	0	\$76	\$2,180,347	5,860	23,453	\$31,845,239	\$358	
1999	92,000	5,724	5,500	\$578	20,000	\$578	28,224	\$11,513,472	17,576	\$74	10,000	\$0	27,576	\$1,295,370	15,424	\$74	\$1,136,766	7,540	\$699	36,136	\$80	7,100	\$80	\$4,031,300	50,776	66,200	\$21,976,908	\$239	
2000	95,000	3,253	5,500	\$613	20,000	\$613	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	\$4,484,045	52,945	66,200	\$23,788,181	\$250	
2001	99,000	5,386	5,500	\$649	20,000	\$649	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	\$4,986,808	55,114	66,200	\$26,466,420	\$267	
2002	103,000	7,217	5,500	\$688	20,000	\$688	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	\$5,638,691	57,283	66,200	\$29,467,809	\$286	
2003	107,000	9,048	5,500	\$730	20,000	\$730	34,548	\$19,557,320	26,252	\$86	10,000	\$0	36,252	\$2,263,444	6,748	\$86	\$181,812	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	\$773	36,379	\$22,304,378	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	\$820	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	\$869	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	23,510	5,500	\$921	20,000	\$921	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	\$976	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	\$63,266,586	\$480	
2009	137,400	34,310	5,500	\$1,033	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	\$1,033	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	63,210	\$63,758,026	31,590	\$113	10,000	\$0	41,590	\$3,584,184	2,410	\$113	\$273,437	7,540	\$1,045	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		\$54,251		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%								
Precious Value																													
																												\$384,636,284	

\$384,636,284

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)

Mark J. Weber
Water Resources Eng

SECTION 8
GROUNDWATER MANAGEMENT PLAN

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 -----			----- Size of Groundwater Management Plan Elements -----				Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	Non Interruptible	Seasonal	Untreated	Agricultural	Blending	Demineralization	Conjunctive		
	Treated Imported Water	Treated Imported Water	Imported Water	Exchange (acre-ft/yr)	 (acre-ft/yr)	 (acre-ft/yr)	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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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

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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

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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 I Short Term Implementation

*September 8, 1994
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- | | |
|---------|---|
| 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

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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.

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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*

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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

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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

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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

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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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APPENDIX A

A-1

AB 3030 with AB 1152 Amendments

PART 2.75

GROUNDWATER MANAGEMENT

Chapter	Section
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	Section
10750. Legislative findings, declarations and intent.	ny without agreement prohibited application of section.
10750.2. Application of part.	10750.8. Management by local agencies within service area of another agency without agreement prohibited; application of section.
10750.4. Adoption of groundwater management plan or program not required.	10750.9. Groundwater management program procedures to establish commence prior to January 1, 1993; completion amendment.
10750.6. Authority of local agencies or water-master to manage groundwater not affected.	10750.10. Other powers.
10750.7. Management by local agencies within service area of another agency, water corporation or mutual water compa-	

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, and should be managed to ensure both its safe production and its quality. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Additions or changes indicated by underline; deletions by asterisks * * *

(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

Additions or changes indicated by underline; deletions by asterisks * * *

§ 10750.9

WATER CODE

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.

Additions or changes indicated by underline; deletions by asterisks * * *

(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		Section	
10753.	Adoption or implementation of plan.	10753.6.	Written protest; contents; majority protest.
10753.2.	Hearing; notice; resolution of intention to adopt plan.	10753.7.	Plan components.
10753.3.	Publication of resolution of intention.	10753.8.	Rules and regulations to implement and enforce plan.
10753.4.	Preparation of plan; adoption; expiration of resolution of intention.	10753.9.	Potential impact of rules and regulations on business activities; consideration
10753.5.	Second hearing; notice; protests to adoption of plan.		

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, 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, may exercise the authority of this part within a groundwater basin * * * that is located within its boundaries within areas that are either of the following:

- (1) * * * Not served by a local agency.

(2) * * * Served by a local * * * agency * * * 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.

(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, or 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 establishing a groundwater management program.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Additions or changes indicated by underline; deletions by asterisks * * *

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.)

Additions or changes indicated by underline; deletions by asterisks * * *

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		Section	
10754.	Local agencies; water replenishment district powers; fees and assessments.		payment of costs; remediation program excluded.
10754.2.	Annual fees and assessments based on amount of groundwater extracted;	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

Additions or changes indicated by underline; deletions by asterisks * * *

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 or a groundwater storage contract with the local agency.

(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

Section

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.

Additions or changes indicated by underline; deletions by asterisks * * *

(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	Derivation: Former § 10764, added by Stats.1991, c. 903 (A.B.255), § 1.
Former § 10755 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.5.	

§ 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 10762, see, now, §§ 10750.7 and 10750.8.
Section 10758, see, now, § 10755.2.	Section 10763, see, now, § 10755.2.
Sections 10759 and 10760, see, now, §§ 10754 and 10754.2.	Section 10764, see, now, § 10755.
Section 10761, see, now, § 10754.3.	Section 10766, see, now, § 10750.10.

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*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.

(id) 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

<u>Reclaimed Water Contribution (%)</u>	<u>Maximum TOC (mg/L)</u>	
	<u>Surface Spreading (Category I)</u>	<u>Direct Injection (Category IV)</u>
<u>0-20</u>	<u>20</u>	<u>5</u>
<u>21-25</u>	<u>16</u>	<u>4</u>
<u>26-30</u>	<u>12</u>	<u>3</u>
<u>31-35</u>	<u>10</u>	<u>3</u>
<u>36-45</u>	<u>8</u>	<u>2</u>
<u>46-50</u>	<u>6</u>	<u>2</u>

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 (except 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

<u>Initial Percolative Capacity (in/min)</u>	<u>Minimum Depth-to-Groundwater (ft)</u>		
	<u>Project Category</u>		
	<u>I</u>	<u>II</u>	<u>III</u>
<u><0.2</u>	<u>10</u>	<u>10</u>	<u>20</u>
<u><0.3</u>	<u>20</u>	<u>20</u>	<u>50</u>

(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.

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*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, remedial 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		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		MCL	Action Level	
Aluminum	Secondary	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			
Cadmium	Current	5	5	.5		40+	5+		D	10		10
Chloramine				100		1000	2600		D			
Chlorate									D			
Chloride	Secondary	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		IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		MCL	Action Level	
Chlorite												
Chromium(Total)	Current	100	100	5		1,000+	100+		D	50		50
Copper	Current Secondary	TT## 1,000	1,300						D			
Cyanide	Current	200	200	22		200+	200+		D			
Fluoride	Current Proposed secondary	4,000 2,000	4,000	120					D	1400- 2400td		
Iron	Secondary	300										
Lead	Current	TT#	0						B2	50		
Manganese	Secondary	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 NO ₃		10ppm (as N)
Nitrite (as N)	Current	1,000	1,000	160		1,000+***			D			
Selenium	Current	50	50	5						10		50

Values are indicated in micro grams per liter ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 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 - 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		IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		MCL	Action Level	
Silver	Secondary	100		5		200	100		D	50		50
Strontium				600		25,000	17,000		D			
Sulfate	Secondary	250 ppm										
Thallium	Current	2	0.5	0.07		7	0.4					
Vanadium				7					D			
Zinc	Secondary	5,000		300		6,000	2,000		D			5,000
Acrylonitrile					0.06	20+		0.06+	B1			10
RADIONUCLIDES												
Gross Alpha, excl. Radium & 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						.22-.26 pCi/l	A	5 pCi/l (+Ra 22)		
Radium 228	Current Proposed	5 pCi/l (+226) 20pCi/l						.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		

Values are indicated in micro grams per liter ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated
 Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10^{-6} risk levels are in micrograms per liter.

RADIONUCLIDES		EPA		IRIS -6		Health Advisories			Wt. of Evid.	California		Arizona MCL
Chemicals	Standard	MCL	MCLG	RfD $\mu\text{g/kg-d}$	10 ⁻⁶ Risk	Acute 10 Day	Chronic (lifetime) Non-Cancer	Cancer		MCL	Action Level	
Tritium									A	20nCi/l		
Uranium	Proposed	20 ppb	0					0.7 ppb	A	20pCi/l		35pCi/l
ORGANIC												
Acenaphthylene (acenaphthene)				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 ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10⁻⁶ risk levels are in micrograms per liter.

TT - Treatment technique in lieu of numeric MCL

a - Effective date postponed

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic (lifetime) Non-Cancer	Cancer		MCL	Action Level	
Aldicarb Sulfoxide	Final(a)	4	1	1.0			7+		D			
Aldrin				0.03	.002	0.3		0.002	B2		100 (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	
Carbaryl				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		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD $\mu\text{g}/\text{kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic Non-Cancer	(lifetime) Cancer		MCL	Action Level	
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 a		20	0.6	7,000+		0.6	B2			
Bromoform (THM)	Current	100 a		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 ($\mu\text{g}/\text{l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g}/\text{kg-d}$), 10^{-6} risk levels are in micrograms per liter.
a - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochloromethane, bromoform

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic (lifetime) Non-Cancer	Cancer		MCL	Action Level	
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 a		20		7,000	60		C			
Chloroform (trichloromethane) (THM)	Current	100 a		10	6	4,000		6.0	B2			
bis-2-Chloroisopropyl 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 ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10^{-6} risk levels are in micrograms per liter.
a - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochloromethane, bromoform

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
		MCL	MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		MCL	Action Level	
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 a		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.

a - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochloromethane, bromoform

HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic (lifetime) Non-Cancer	Cancer		MCL	Action Level	
Dichloroacetic Acid				8		50,000+			B2			
Dichloroacetonitrile				8		1000+	6+		C			
1,2-Dichlorobenzene (o-Dichlorobenzene)	Current Proposed secondary	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 secondary	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
1,1-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 ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10^{-6} risk levels are in micrograms per liter.

*** - Action Level is for a single isomer or sum isomers

ORGANIC Chemicals	Standard	EPA		IRIS -6		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		MCL	Action Level	
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		IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
		MCL	MCLG	RfD $\mu\text{g}/\text{kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic Non-Cancer	(lifetime) Cancer		MCL	Action Level	
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 secondary	700 30	700	100		3,000+	700+		D	680		
Ethylene Dibromide (dibromoethane) (EDB)	Current	0.05	0		$4\text{E-}4$	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 ($\mu\text{g}/\text{l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g}/\text{kg-d}$), 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		IRIS -6		Health Advisories			Wt. of Evid.	California		Arizona MCL
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10 ⁻⁶ Risk	Acute 10 Day	Chronic Non-Cancer	(lifetime) Cancer		MCL	Action Level	
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 secondary ⁸	50	50	7					D			
n-Hexane						4,000+			D			

Values are indicated in micro grams per liter ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10⁻⁶ risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	MCL	EPA MCLG	IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
				RfD $\mu\text{g}/\text{kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic(Lifetime) Non-Cancer	Cancer		MCL	Action Level	
Hexazinone				33		3,000+	200+		D			
Isophorone				200		15,000+	100+		C			
Lindane (gamma-HCH) (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			
terphos				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 ($\mu\text{g}/\text{l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g}/\text{kg-d}$), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		MCL	Action Level	
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 ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic Non-Cancer	(lifetime) Cancer		MCL	Action Level	
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			
DX				3	0.3	100+	2+	.3	C			
Simazine	Current	4	4	5		70	4+		C	10		
Styrene	Current Proposed secondary	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		IRIS		Health Advisories			Wt. of Evid.	California		Arizona
		MCL	MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic (Lifetime) Non-Cancer	Cancer		MCL	Action Level	
Tetrachlor (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 secondary	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 a		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.
a - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochloromethane, bromoform

ORGANIC Chemicals	Standard	EPA		IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
		MCL	MCLG	RfD $\mu\text{g/kg-d}$	10^{-6} Risk	Acute 10 Day	Chronic Non-Cancer	(lifetime) Cancer		MCL	Action Level	
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 Trichlorophen- 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			
Trihalomethanes (THM) (See Chloroform)	Current	100 a							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 secondary	10ppm 20	10ppm	2000		40,000+	10,000+		D	1750		

Values are indicated in micro grams per liter ($\mu\text{g/l}$) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day ($\mu\text{g/kg-d}$), 10^{-6} risk levels are in micrograms per liter.

HI - State of Hawaii MCL

a - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochloromethane, bromoform

TT - Treatment technique in lieu of numeric MCL

MICROB.-TURBIDITY				IRIS		Health Advisories			Wt. of Evid.	California		Arizona MCL
Chemicals	Standard	EPA MCL	EPA MCLG	RfD µg/kg-d	10 ⁻⁶ Risk	Acute 10 Day	Chronic(lifetime) Non-Cancer	Cancer		Action Level		
MICROB.-TURBIDITY												
Giardia Lamblia	Current	TT	0									
Heterotrophic Plate Count	Current	TT	β	NA								
Legionella	Current	TT	β	0								
Total Coliforms	Current	P/A 22	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.

22 - P/A - MCL is based on the presence/absence of total coliforms

2 - 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	Methyl t-butyl ether
2,6-Dinitrotoluene	Naphthalene
1,2-Diphenylhydrazine	Nitrobenzene
Fluorotrichloromethane	1,1,1,2-Tetrachloroethane
Hexachlorodutadiene	1,1,2,2-Tetrachloroethane
Hexachloroethane	Tetrahydrofuran
Isophorone	Trichloroacetonitrile
Methyl ethyl ketone	1,2,3-Trichloropropane
Methyl isobutyl ketone	

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 federally 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 known 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 equivalent 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.

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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.

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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		

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		

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		

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		

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		

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		

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	

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 F - Hemet/San Jacinto Groundwater Management Area Water Management Plan

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Hemet/San Jacinto Groundwater Management Area



Water Management Plan

Prepared for:



in coordination with:



Prepared by:



in association with Stetson Engineers and Geoscience

November 7, 2007



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Hemet/San Jacinto Groundwater Management Area Water Management Plan

November 7, 2007

Prepared for:

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Lake Hemet Municipal Water District
City of Hemet
City of San Jacinto

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SELECTED ACRONYMS, ABBREVIATIONS, AND TERMINOLOGY

Advisor	independent engineering firm or a qualified individual
AF	acre-foot
AFY	acre-feet per year
Agreement	Settlement Agreement
Association	Hemet/San Jacinto Groundwater Association
CAM	Consultants-Attorneys-Managers
CEQA	California Environmental Quality Act
cfs	cubic feet per second
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
FMWC	Fruitvale Mutual Water Company
GIS	Geographic Information System
Hemet North	Hemet North portion of the Lakeview/Hemet North
IRRP	Integrated Recharge and Recovery Program
JPA	Joint Powers Authority
JUDGMENT	Stipulated Judgment
Legal Counsel	independent attorney or legal firm
LHMWD	Lake Hemet Municipal Water District
Management Area	Hemet/San Jacinto Groundwater Management Area
MGD	million gallons per day
MOU	Memorandum of Understanding
MWD	Metropolitan Water District of Southern California
PC	Policy Committee
Plan	Hemet/San Jacinto Water Management Plan
Plan Participants	EMWD, LHMWD, Private Water Producers, and Cities of Hemet and San Jacinto (collectively)
Principles	Principles for Water Management
Private Water Producers	Property owners who are pumping groundwater pursuant to overlying water rights
Public Agencies	EMWD, LHMWD, and Cities of Hemet and San Jacinto (collectively)
RCFC&WCD	Riverside County Flood Control and Water Conservation District
RWQCB	Santa Ana Regional Water Quality Control Board
RWRD	Regional Water Resources Database
S.A.A.	Settlement Agreement Approval
S.J.A.	Stipulated Judgment Approval
Soboba Tribe	Soboba Band of Luiseno Indians
TC	Technical Committee
TDS	Total Dissolved Solids

TM	Technical Memorandum
TMDL	Total Maximum Daily Load
Upper Pressure	San Jacinto - Upper Pressure Management Zone
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
Watermaster	Watermaster Governing Board
WRIME	Water Resources & Information Management Engineering, Inc.

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BACKGROUND AND GOALS

The stakeholders in the Hemet/San Jacinto Groundwater Management Area (Figure ES.1) have developed the Hemet/San Jacinto Water Management Plan (Plan) to provide a foundation that guides and supports responsible water management into the future. The Participants in the Plan are Eastern Municipal Water District (EMWD), Lake Hemet Municipal Water District (LHMWD), Cities of Hemet and San Jacinto (Public Agencies), and Private Water Producers.

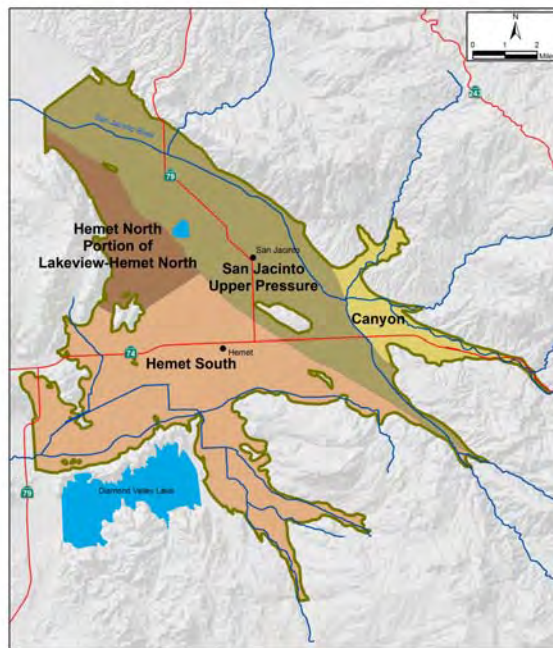


Figure ES.1 Hemet/San Jacinto Groundwater Management Area and Management Zones

Private Water Producers are those property owners who are pumping groundwater pursuant to overlying water rights, typically for agricultural or domestic uses. Private Water Producers may elect two levels of participation in the Plan, with varying levels of benefits and responsibilities, or may elect not to participate. The details on this matter are described in Section 2 of the Plan document.

The Plan, adopted by the governing bodies of the Plan Participants, has eight primary goals:

- Address pumping overdraft and declining groundwater levels,
- Provide for Soboba Tribe prior and paramount water rights,

- Ensure reliable water supply,
- Provide for planned urban growth,
- Protect and enhance water quality,
- Develop cost-effective water supply,
- Provide adequate monitoring for water supply and water quality, and
- Supersede the Fruitvale judgment and agreement.

GROUNDWATER AS A CORNERSTONE FOR WATER MANAGEMENT

The goals of the Plan are interrelated and begin with maintaining groundwater as a high-quality, low-cost, flexible source of water. Efforts are needed to make this happen, as historical groundwater pumping in excess of the Safe Yield of the groundwater basin has resulted in decreasing trends in water levels. In addition, historical land and water use practices for agricultural irrigation and dairy industry waste have raised the levels of nitrates and total dissolved solids in groundwater. Safe Yield, the long-term average quantity of water that can be pumped without causing undesirable results, has been estimated at 40,000 to 45,000 AFY, while average annual production exceeds this amount by approximately 10,000 to 15,000 AFY. The 10,000 to 15,000 AFY difference between the long-term average annual groundwater production and Safe Yield is known as overdraft, which can be responsible for creating undesirable conditions in the basin, including degradation of groundwater quality. The Plan assumes a pragmatic and economic approach in setting the target to reduce overdraft, and assumes an overdraft of 10,000 AFY. This will allow the Plan Participants and the Watermaster to initiate and adopt plans and policies to eliminate overdraft with implementation of economically feasible and cost-effective projects. The Plan intends to stabilize or reverse the decreasing trend in water levels through reducing groundwater production to a level that brings the basin production within the Safe Yield of the Management Area. Higher water levels will increase water in storage, decrease energy costs for pumping, and inhibit the migration of poor quality groundwater from surrounding basins, helping to protect groundwater quality in the Management Area.

INTEGRATION OF GROUNDWATER WITH OTHER WATER SOURCES AND DEMAND MANAGEMENT TO MEET FUTURE WATER NEEDS

The Plan Participants have several options available to increase water supply and reliability in the Management Area. Water used in the Management Area for agricultural and domestic use comes from groundwater, surface water, imports, and recycled water. As shown on Figure ES.2, most of this water has historically been from groundwater, based on 2004 data. This allows significant opportunities for underutilized sources, particularly recycled water and

winter-time imported water, to replace or augment groundwater production. The regional cooperation developed over the years is also of importance as the supply mix varies between the different water users in the Management Area; by cooperating, the water users can fully utilize their available water resources.

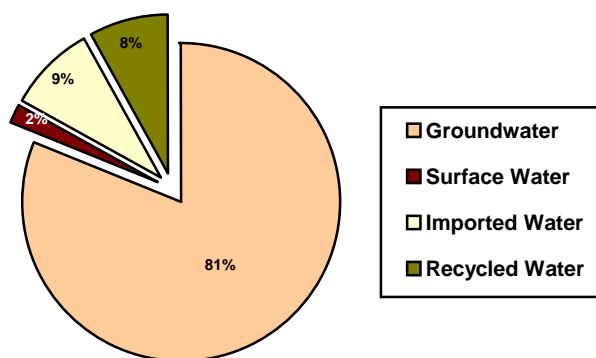


Figure ES.2 Components of Management Area Water Supply

The high-quality groundwater basin also plays an important role in future water availability. Historical declines in groundwater levels are a concern and a major impetus for the development of this Plan. However, even the dewatered portion of the groundwater basin is a significant asset and allows for the full utilization of the available water supplies mentioned above. The new water supplies can be introduced into the system filling the empty portions of the groundwater basin by either substitution for pumping groundwater (in-lieu recharge) or by placing the water in the groundwater system through seepage from specially designed ponds or through injection from wells (direct recharge). Both these methods benefit the Management Area groundwater basin, which is composed of materials that can store large quantities of water and holds high quality groundwater that can be pumped for usage at a later time. A complex system of faults and other geologic features separate the groundwater system into four Management Zones (see Figure ES.1), which require some degree of individual attention in planning and designing recharge and extraction projects, based on each Management Zone's unique attributes.

The numerous water supply opportunities along with water conservation by both the Public Agencies and Private Water Producers will be utilized to meet the current and future water needs of the Management Area. Based on the latest data and information on land and water practices, general plans, urban water management plans, and other specific plans, water demand in the Management Area is projected to increase over the course of next 15-20 years (Figure ES.3). Based on these projections, there will also be a shift from agricultural water use

to urban water use, resulting in more stringent water quality requirements to meet drinking water standards.

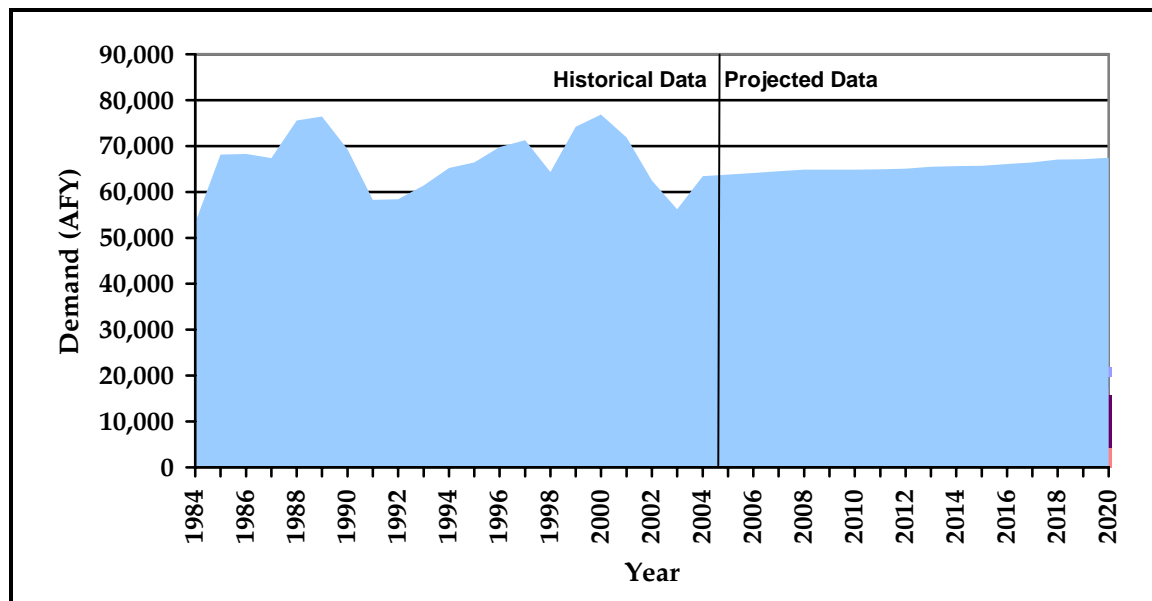


Figure ES.3 Historical and Projected Water Demand

PHYSICAL SOLUTION IS THE BASIS OF WATER SUPPLY PROJECT IN THE MANAGEMENT AREA

As described in the Stipulated Judgment, the Physical Solution is the court decreed method of managing the water supply in the Management Area to maximize the reasonable and beneficial use of the waters, eliminate overdraft, protect the prior rights of the Soboba Tribe, and provide for the substantial enjoyment of all water rights by recognizing their priorities. The Physical Solution consists of numerous water supply and conjunctive use projects, including direct and in-lieu recharge, increased use of recycled water, increased conservation, and improved monitoring. The core project in the Physical Solution is the Hemet/San Jacinto Integrated Recharge and Recovery Program (IRRP). Phase I of the IRRP has been designed, funded, the necessary environmental permits have been acquired, and construction is currently underway. Phase II is in planning stages. The IRRP is a regional recharge and recovery program to meet the following goals:

- Satisfy Prior and Paramount Soboba Tribe water rights;
- Offset the estimated 10,000 AFY overdraft in the Management Area; and
- Provide an additional 15,000 AFY to help meet the projected demand increases.

In addition to IRRP, the Plan identifies other projects that can potentially meet the above goals. These include direct recharge, in-lieu recharge, and recycled water projects.

A FIRM LEGAL AND INSTITUTIONAL ARRANGEMENT

Development of a comprehensive system of water management begins with the legal and institutional framework. To meet the goal of reducing groundwater production to eliminate overdraft, the Public Agencies agreed upon some basic principles as a basis for allocating Base Production rights. Base Production rights establish the initial amount that each Public Agency would be able to pump without the need to replenish the basin. The Base Production rights are calculated on the basis of actual production by Public Agencies during 1995-99 calendar years, and adjusted for specific historical operational activities, such as:

- Recharge Activities;
- MWD San Jacinto Tunnel Seepage;
- Fruitvale Entitlement Water Sold by EMWD to LHMWD, Hemet, and San Jacinto;
- Stream Diversions;
- Conveyance Water Deliveries; and
- Other Considerations.

The Public Agencies have, therefore, agreed to the following Base Production Rights:

Table ES.1 Public Agency Base Production Rights

Public Agency	Base Production Rights (AFY)	Base Production Rights (Percent)
EMWD	10,869	33.7
LHMWD	11,063	34.2
City of Hemet	6,320	19.6
City of San Jacinto	4,031	12.5
Total	32,283	100

Surface water rights are not impacted and/or changed by the Plan or any other recent agreements. LHMWD diverts water from the San Jacinto River and its tributaries through its pre-1914 water rights to meet their irrigation and municipal water demands, and EMWD has a license to divert water from the San Jacinto River for recharge purposes.

Soboba Tribal water rights are recognized throughout the Plan, and details of the monetary, water quantity, water quality, and property requirements to meet the obligations set forth in the settlement agreement with the Soboba Tribe are discussed in Section 8 of the Plan.

The Institutional Plan, discussed in Section 9 of the document, assigns the administration,

implementation, and monitoring of the Plan to a Watermaster. The Watermaster will consist of one elected official representing each of the Public Agencies and one representative selected by the participating Private Water Producers. The Watermaster will utilize the counsel of legal advisor, as well as provide technical oversight through an Advisor and Technical Advisory Committee. The Watermaster will utilize services of EMWD for recharge operations and administration and monitoring of the projects and the Plan. The relationships and basic responsibilities of these entities are summarized in Figure ES.4. The Watermaster will also review, approve, and adopt the annual budget, which will be funded by administrative assessments and replenishment assessments. The details of Watermaster administration are discussed in Section 9 of the Plan document.

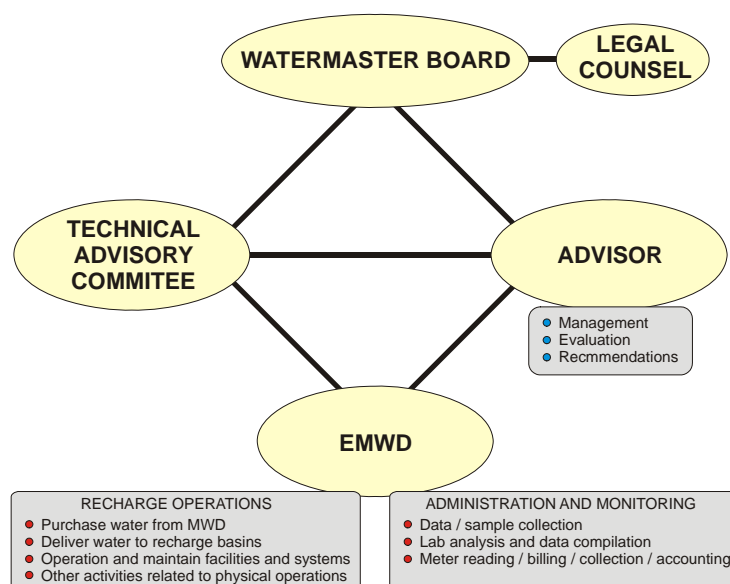


Figure ES.4 Plan Institutional Setup

IMPLEMENTATION AND PLAN EVOLUTION

The implementation of the Plan, along with any additions or modifications as may become appropriate, and all financial matters relating to Plan activities are the responsibility of the Watermaster. The implementation process can be divided into two processes: implementation and ongoing activities. The schedules for these processes are shown in Table ES.2 and Table ES.3.

Table ES.2 Implementation Schedule

Months after Approval of Stipulated Judgment	Implementation Item
Month 1	Determine the method of selection for the Private Pumper representative.
Month 2	Select Public Agency and Private Pumper representatives.
Month 3	Hold first meeting of the Watermaster. Contract with EMWD for Watermaster services.
Month 4	none
Month 5	none
Month 6	Retain legal council and advisor. Prepare and adopt Rules and Regulations for its own operation as well as for the operation of the Water Management Plan and Judgment. Review and reissue agreements and MOUs, as needed.
Upon Settlement Agreement Implementation	Recognize Tribal water rights.

Table ES.3 Ongoing Schedule

Timing	Frequency	Activity	Responsibility
January 1	Annual	Propose Monitoring Program.	EMWD
End of January	Annual	Review Monitoring Program.	Advisor
End of February	Annual	Approve budget for Monitoring Program.	Watermaster
1 st Quarter	Annual	Advance payment of Administrative Assessments.	Public Agencies
1 st Quarter	Annual	Payment of Replenishment Assessments.	Public Agencies
Four months after completion of calendar year monitoring	Annual	Submit Annual Hemet/San Jacinto Water Management Area Report.	EMWD
As needed	As needed	Revise safe yield.	Advisor
TBD	Annual	Prepare, File, and Distribute Watermaster Annual Report.	Watermaster

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1.1 PROJECT BACKGROUND

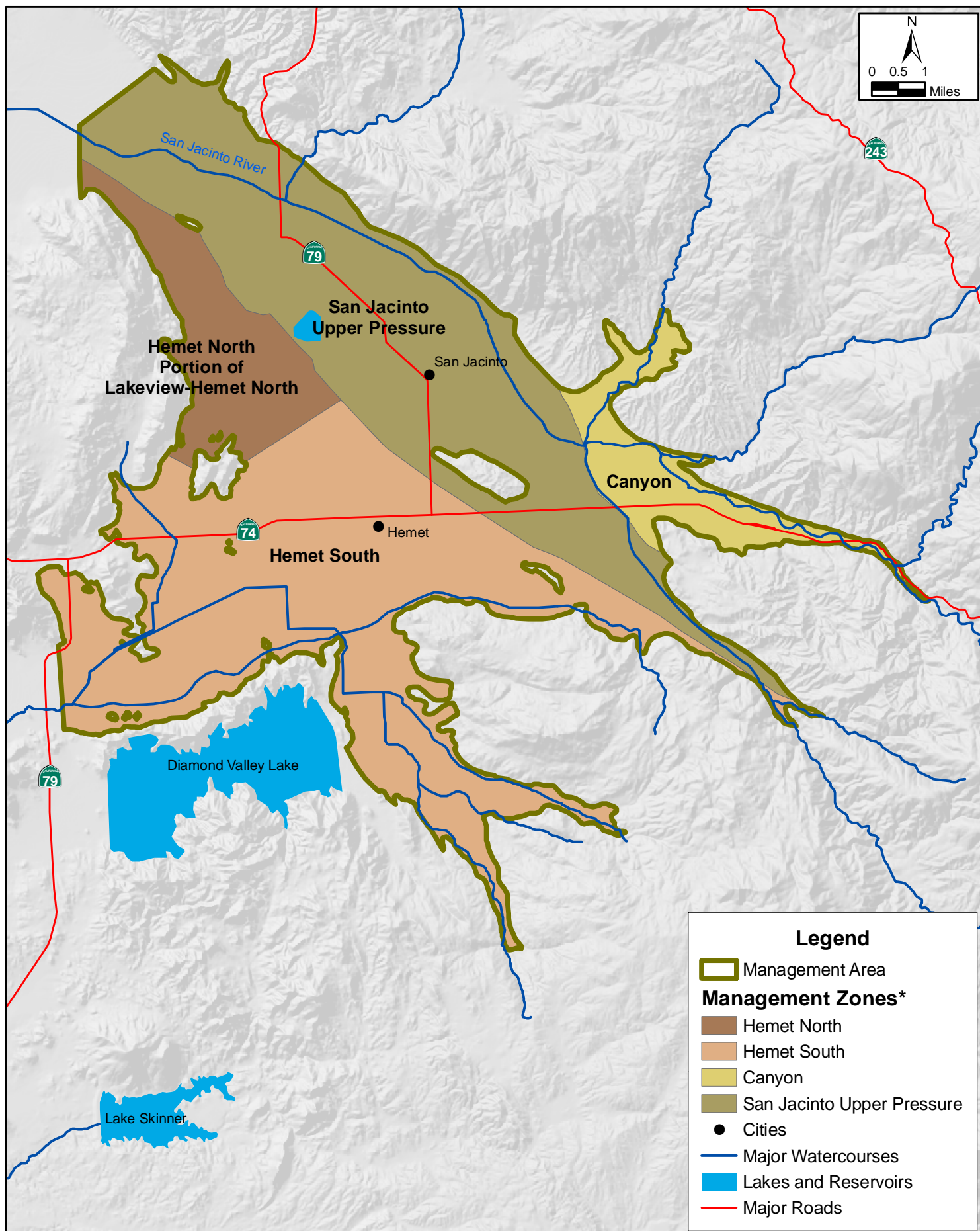
The stakeholders in the Hemet/San Jacinto Groundwater Management Area (Figure 1.1) (Management Area) have developed the Hemet/San Jacinto Water Management Plan (Plan) to provide a foundation that guides and supports responsible water management in the future. The local stakeholders involved in the Plan include Eastern Municipal Water District (EMWD), Lake Hemet Municipal Water District (LHMWD), Cities of Hemet and San Jacinto, and Private Water Producers, collectively referred to as “Plan Participants”. EMWD, LHMWD, and the Cities of Hemet and San Jacinto are collectively referred to as “Public Agencies”.

A Policy Committee (PC) of the Plan Participants developed and adopted the Principles for Water Management (Principles), which guide the management, development, and governance of local water supplies. The adopted Principles, along with a variety of technical analyses, guided development of the Plan. The PC established the Principles based on the historical data on the operation of the groundwater basin; historical and projected water demands; and existing and potential future facilities. The California Department of Water Resources (DWR) provided financial, facilitation, and technical support to the PC.

A Technical Committee (TC) supported the PC and served as the investigative and review body to ensure that proper technical analyses were conducted to provide a defensible technical foundation for the Plan. The TC provided technical input to support decisions by the Public Agencies, Private Water Producers, and other stakeholders. DWR also provided financial and technical support to the TC.

A Consultants-Attorneys-Managers (CAM) committee served as an interim body to develop and review technical, legal, institutional, and financial documents, plans, and standards. The CAM committee discussed the technical/policy/legal issues in anticipation of evolving documents and recommendations for action by the policy makers for the PC.

EMWD and LHMWD have also worked with the Soboba Band of Luiseño Indians (Soboba Tribe) and the Federal Government to develop a Settlement Agreement (Agreement) (Appendix A) that would resolve past issues with respect to Tribal water rights and the water management practices in the basin. The Agreement will be supported by two stipulated



judgments¹ that will provide the legal and technical basis for future water supplies for the Soboba Tribe.

1.2 WATER MANAGEMENT PLAN

The Plan, adopted by the governing bodies of the Plan Participants, will provide a roadmap for implementation of the Physical Solution, ensure adequate and reliable sources of future water supply for the Management Area, and meet the Prior and Paramount Soboba Tribe water rights requirements. The Plan may be modified and updated in the future based on, among other things, the availability of new data, updated technical analysis, and changes in the institutional/financial structure of the stakeholders.

1.3 PHYSICAL SOLUTION

As described in the Stipulated Judgment (Appendix B), the Physical Solution is the court decreed method of managing the water supply in the Management Area to maximize the reasonable and beneficial use of the waters, eliminate overdraft, protect the prior rights of the Soboba Tribe, and provide for the substantial enjoyment of all water rights by recognizing their priorities. Therefore, the Physical Solution is a group of water supply and conjunctive use projects that would serve this purpose.

The project that is considered to be the core of the Physical Solution is Phase I of the *Hemet/San Jacinto Integrated Recharge and Recovery Program (IRRP)*. Phase I of the IRRP has been designed, funded, and the necessary environmental permits are being acquired. Phase II is in planning stages. The complete project is designed to recharge (replenish) imported water and extract groundwater at a capacity such that the following goals are met:

1. Satisfy Prior and Paramount Soboba Tribe water rights;
2. Offset the estimated 10,000 acre-feet per year (AFY) overdraft in the Management Area; and
3. Provide an additional 15,000 AFY to help meet the projected demand increases.

Major elements of Phase I of the Project are:

- Modifications to Pump Stations (Warren and Commonwealth);
- Construction of Pipelines;

¹ These judgments are in the case of *Soboba Tribe v. Metropolitan Water District, et. al.*; U.S. District Court in Los Angeles, Case No. 00-04208 GAF, and in a Riverside County Superior Court action, yet to be filed.

- Design and Construction of Recharge Basins;
- Drilling Three Extraction Wells;
- Installation of Pumps and Chlorination Equipment for Three Extraction Wells; and
- Design and Drilling of Three Monitoring Wells.

Additional details on Phase I of the IRRP are presented in Section 3.2.2 of this Plan, and details on Phase II are presented in Section 5.3.1.

In addition to the *San Jacinto River Integrated Recharge and Recovery Project*, there are other projects that the TC has identified as potential projects to be further considered in the future as part of the Physical Solution for the Management Area. These include *direct recharge* and *in-lieu recharge* projects and are described in Section 5.3 of this Plan.

1.4 WATER MANAGEMENT PLAN GOALS

The Principles include eight primary goals for the management of water resources in the Management Area. These are:

- Address pumping overdraft and declining groundwater levels,
- Provide for Soboba Tribe prior and paramount water rights,
- Ensure reliable water supply,
- Provide for planned urban growth,
- Protect and enhance water quality,
- Develop cost-effective water supply,
- Provide adequate monitoring for water supply and water quality, and
- Supersede the Fruitvale judgment and agreement.

This section briefly describes the geographic boundaries of the four divisions, or Management Zones, that make up the Management Area and provides a brief history and background on each of the primary stakeholder organizations. Past agreements and related activities leading to the Plan are discussed below, including the role of the state and public participation.

2.1 MANAGEMENT AREA

The Management Area is divided into four Management Zones: The Canyon, San Jacinto Upper Pressure (Upper Pressure), Hemet South, and the Hemet North portion of the Lakeview /Hemet North (Hemet North). The locations of the Management Zones are shown in Figure 1.1. The delineation of the Management Zones is based on the recent update by the Santa Ana Regional Water Quality Control Board (RWQCB) in the *Water Quality Control Plan - Santa Ana River Basin (RWQCB, as amended 2004)*. The RWQCB defined these boundaries on the basis of hydrogeologic conditions to support implementation of specific water quality criteria. Additional descriptions of the basin hydrogeology are provided in Section 4.

2.2 MANAGEMENT PLAN PARTICIPANTS

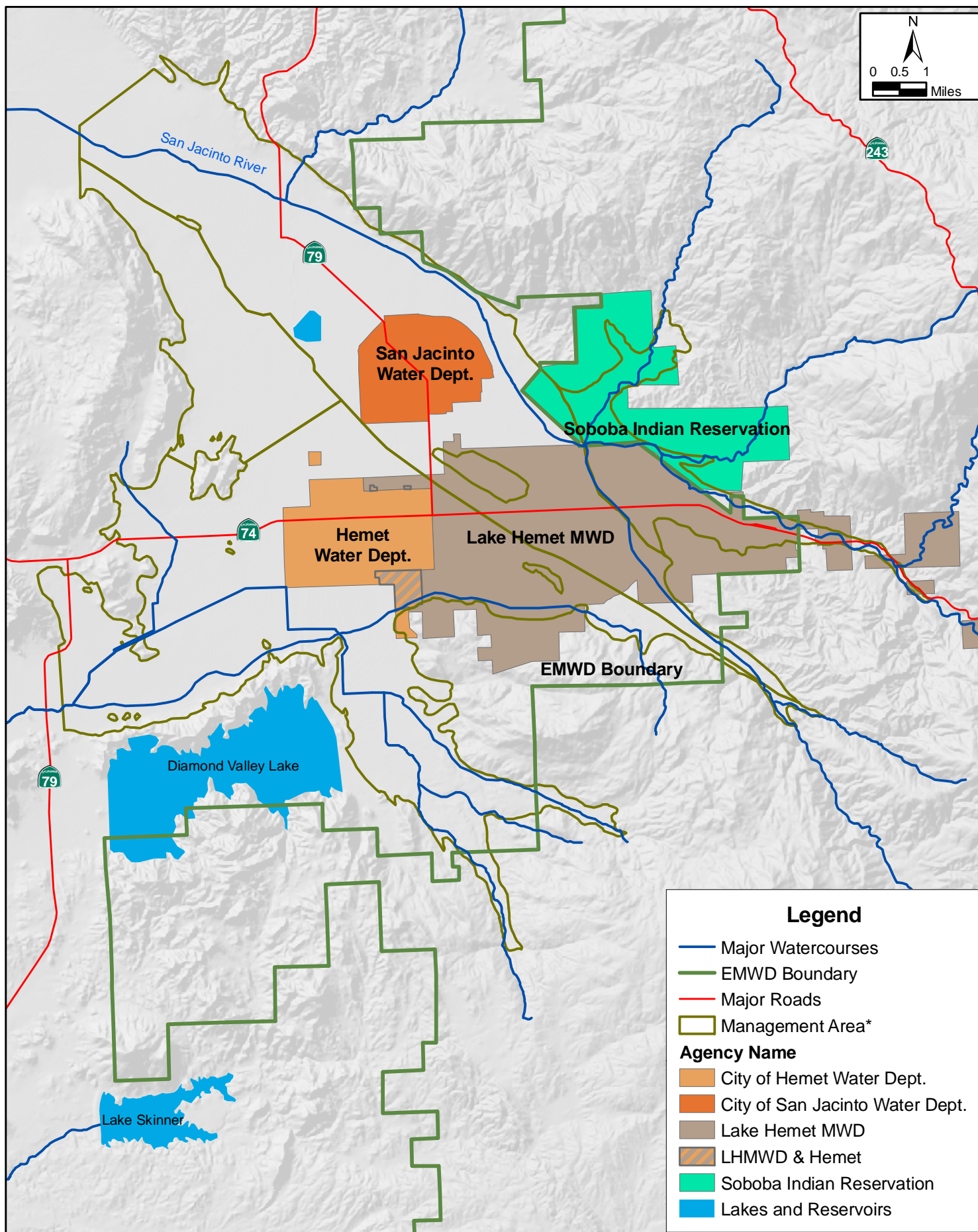
A map of the service areas of the Public Agencies near the Management Area and the Soboba Reservation is provided in Figure 2.1. The Plan Participants are briefly described below.

2.2.1 PUBLIC AGENCIES

EMWD, LHMWD, the City of Hemet, and the City of San Jacinto provide water service in various areas of the Canyon, Upper Pressure, Hemet South, and Hemet North Management Zones. A list of governing bodies is provided in Appendix C. Additionally, there are a number of Private Water Producers extracting groundwater for agricultural and domestic use.

2.2.1.1 Eastern Municipal Water District (EMWD)

Since its formation in 1950, EMWD has matured from a small agency primarily serving agriculture to one whose major demands come from domestic customers. In 1951, EMWD annexed to the Metropolitan Water District of Southern California (MWD). With the purchase of the Fruitvale Mutual Water Company (FMWC) in 1971, EMWD acquired all of Fruitvale's



assets including appropriative, prescriptive, and riparian water rights; water system, wells, well sites, pumps, and storage; real property, easements, rights, and interests; and franchises, permits, and licenses. Over time, the agency has continued to grow. Today, in addition to providing retail service, EMWD provides wholesale water to the seven local water agencies within its service area, including the three remaining Public Agencies in the Management Area.

As of 2005, EMWD serves approximately 113,000 retail connections, including approximately 200 agricultural connections, in a service area with an estimated population of 567,000 within the 555-square-miles, including many areas outside the Management Area. The population within EMWD's boundaries is expected to grow to 830,000 by 2025 (EMWD, 2005a), not including the population of the Rancho California Water District.

In addition to wholesale and retail potable water supply, EMWD's services include wastewater collection and treatment as well as water recycling. The San Jacinto Valley Regional Water Reclamation Facility is an 11 million gallons per day (MGD) plant that provides most of the treatment and water recycling capability for the Management Area.

The five-member Board of Directors comprise the governing body of EMWD and are responsible for setting the policies guiding the operations of the District. Board members are elected to four-year terms by the registered voters from five geographic divisions, which are apportioned on the basis of population distribution. Terms of service are staggered to ensure continuity; public elections are held in at least two divisions every two years. Directors must reside within the division from which they are elected.

The 2004 water use in the portion of the EMWD service area within the Management Area was 13,900 AFY, and it is projected to increase to 21,000 AFY by the year 2020 (EMWD, 2005b).

2.2.1.2 Lake Hemet Municipal Water District (LHMWD)

LHMWD was created in its present form in 1955, but its origins date back to the late 1880s. The service area covers 16,500 acres in the Hemet/San Jacinto Valley area with an additional 2,200 acres in Garner Valley. LHMWD provides water to residential and agricultural customers in its service area. All wastewater collection and treatment within the LHMWD area is performed by EMWD.

LHMWD operates the Hemet Dam and reservoir. The dam, an engineering marvel at the time of its construction in 1895, is a gravity-type, granite dam. LHMWD historically treated a portion of this surface water for domestic use, however since 1998 the surface water treatment plant has been offline and all surface water usage has been for untreated agricultural uses.

LHMWD usually maintains approximately 11.7 million gallons in storage in the Hemet/San Jacinto Valley.

LHMWD customers are represented by a publicly elected board of five directors from five divisions, representing approximately 13,700 domestic and 52 agricultural connections within a 21-square mile service area with a 2005 population of approximately 39,100. The population within the LHMWD service area is expected to grow to approximately 49,500 by 2025 (LHMWD, 2005).

The 2004 water use within the LHMWD service area was estimated to be 16,900 AFY. Due to the expected benefits of more robust conservation efforts, demand is projected to remain fairly constant over the next several years despite an increasing number of service connections. Demand in 2020 is expected to be 16,300 AFY before increasing above the 2004 demand level in years thereafter (LHMWD, 2005).

2.2.1.3 The City of Hemet

The development of Hemet began in 1887 with the formation of the Lake Hemet Water Company and the Hemet Land Company by W. F. Whittier and E. L. Mayberry. The completion of the Hemet Dam in 1895, the formation of Lake Hemet behind the dam, and a water distribution system to and through the valley made future development of the Hemet area possible.

As of 2005, the city had a population of 78,600 with an area of approximately 26 square miles. City of Hemet anticipates a population growth to 154,000 by 2025 (Hemet, 2006).

The City of Hemet was incorporated on January 20, 1910 with a population of 992. The city government is a Council/Manager form of government with seven elected positions, which includes five Council Members, one City Treasurer, and one City Clerk. The Mayor is elected by the Council Members and serves a one-year term. All Council Members serve a four-year term.

The City of Hemet Water Department treats and distributes water to 9,500 connections, covering 5 square miles of the city area. The 2005 population of the Water Department's service area is 20,200 and is projected to grow to 22,300 by 2025. EMWD and LHMWD serve the remaining 21 square miles of the city, with 7,830 and 3,025 connections, respectively. All wastewater collection and treatment within the City of Hemet area is performed by EMWD.

The 2004 water use within the City of Hemet Water service area was estimated to be 6,000 AFY, and is projected to increase to 6,700 AFY by year 2020 (Hemet, 2006).

2.2.1.4 The City of San Jacinto

Incorporated in 1888, San Jacinto is one of the oldest communities in Riverside County. The city has a Council/Manager form of government with a five member Council that includes a Mayor and Vice Mayor. The City of San Jacinto Water/Wastewater Divisions are responsible for the health and safety of the community through the delivery of the potable water supply and the collection of wastewater. The city wastewater collection system is maintained by this Division while wastewater treatment service is provided by EMWD.

The 2005 population of the city was 34,100; it is anticipated the population of the city will grow to 63,600 by 2025 (San Jacinto, 2005). The City of San Jacinto Water Department serves the central portion of the city with approximately 3,700 residential and commercial service connections. The 2005 population of the Water Department's service area is 13,200 and is projected to grow to 24,000 by 2025. The remaining portions of the city are served by EMWD and LHMWD, which have 4,636 and 475 service connections within the city boundaries, respectively.

The 2004 water use within the City of San Jacinto water service area was estimated to be 3,100 AFY, and is projected to increase to 5,100 AFY by year 2020 (San Jacinto, 2005).

2.2.2 PRIVATE WATER PRODUCERS

Private Water Producers are those property owners who are pumping groundwater pursuant to overlying water rights, typically for agricultural or domestic uses. Historically there was no comprehensive metering program in-place to monitor groundwater production and/or water use by the Private Water Producers. EMWD collected groundwater data through an informal, voluntary monitoring program. In 2004 the Hemet/San Jacinto Groundwater Monitoring Program was initiated by the Public Agencies and the DWR to collect, analyze, and compile groundwater-related data (EMWD, 2005).

It is estimated, on the basis of limited data and land use analysis, that the 2004 water use by Private Water Producers was about 22,200 AFY. This annual level of water use is unusually low, compared to a long-term average of 31,000 for 1984-2004 (WRIME, 2003a). Water use is expected to drop to approximately 16,000 AFY by 2020.

The Public Agencies recognize the overlying water rights of Private Water Producers, and the Principles provide several options for voluntary participation in the Plan by the Private Producers. For more details, please see the Principles provided in Appendix D.

There are two classes of participants, Class A and Class B; both agree to have their wells metered and to have those meters read by EMWD personnel at no cost to the participants. The two types of participants are further explained below.

2.2.2.1 Class A Participants

A Private Water Producer can sign an agreement acknowledging the existence of the Plan, while not being required to participate in Plan implementation. Class A participants are allowed to vote for and/or serve as the Private Water Producer representative on the Watermaster board. The Class A participants may continue to pump from their property without assessments by the Watermaster, so long as the water is put to a reasonable and beneficial use as authorized by California law.

The Class A participants have the right to convert to Class B during a grace period that ends 3 years after the entry of the Stipulated Judgment, and upon payment of the total assessments without interest, as if they were Class B participants to begin with.

2.2.2.2 Class B Participants

A Private Water Producer can become a Class B participant by electing to limit annual pumping to their estimated average annual production during the 1995 – 1999 calendar years and by agreeing to pay replenishment assessments on amounts in excess of that average annual production.

Like Class A Participants, Class B Participants can vote for and/or serve as the Private Water Producer's representative on the Plan's governing board. Additional benefits are given to Class B Participants as well. Under certain conditions, the Class B Participant can convey their Adjusted Production Right to the Plan or to a Public Agency. Also, upon conversion from agricultural to urban uses, Class B Participants would receive credits from the Public Agency toward the satisfaction of any requirements then in effect for water supplies and toward any fees associated with water supply that the Public Agency may then have in effect. For more information on production rights, please see Section 6.

2.2.2.3 Non-Participants

A Private Water Producer can elect not to participate in the Plan and not to formally acknowledge its existence. These non-participants will continue to exercise their water rights unaffected by the Plan.

2.2.3 ROLE OF STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

In June 2001, the DWR executed a Memorandum of Understanding (MOU) with EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Initially, DWR worked to bring the group together to establish a mutual understanding of the issues in the Management Area. The goals of the group were determined and included the following: (i) finalizing an approach to groundwater management; (ii) settling on a mechanism to involve the Plan Participants in the water rights claim by the Soboba Tribe; (iii) agreeing on the basic components of a regional conjunctive use program; and (iv) establishing the necessary institutional structures. Major involvement of the DWR to-date include providing technical support to the TC and PC on resolving various technical and data analysis issues, providing facilitation and mediation support to the PC and the CAM committee, providing financial support on a number of studies and projects, including the Plan document.

2.2.4 PUBLIC PARTICIPATION

There have been numerous opportunities for public input into the development of the Plan. Meetings were held for the public at the beginning of the Plan process to provide information and gather input. While the Plan was being developed, more opportunities were provided for public input, including TC and PC meetings and meetings with the Private Water Producers, all of which were open to the public. The public was also given the opportunity to review the draft of the Plan and submit comments.

2.3 PREVIOUS AGREEMENTS AND INSTITUTIONAL BODIES

During the course of history of water supply in the Management Area, there have been other agreements and institutional bodies that have been formed and operated to facilitate the management of water supplies. Following is a brief description of these agreements and institutional bodies, which are no longer active or are superseded by this Plan.

2.3.1 FRUITVALE JUDGMENT AND DECREE

The Fruitvale Judgment and Decree (The City of San Jacinto, et al., v. Fruitvale Mutual Water Company, et al., No. 51546, Riverside County) was entered into Book 72, Page 164 of Judgments, Riverside County, on June 4, 1954. Under the Judgment and Decree, FMWC could extract groundwater from an area which largely corresponds to the Canyon Management Zone without any restrictions as long as a specified criteria regarding static depth to groundwater and production limits were met. After purchase of FMWC, EMWD was subject to the

provisions of the Judgment and Decree. The Water Management Plan and related Stipulated Judgment will subsume and supersede the 1954 Fruitvale Judgment and Decree, along with any other agreements between EMWD and other agencies related to the FMWC acquisition, provided that none of the service area agreements included in the Fruitvale documents or those related to mutual aid or system interties are affected by this Plan or the Stipulated Judgment.

In 1971, EMWD purchased all of FMWC's assets and water rights, and FMWC was dissolved. EMWD also agreed to continue to provide to the Cities of Hemet and San Jacinto and LHMWD the amounts of water which they had been entitled to receive as shareholders in FMWC. These deliveries were known as "entitlement water" and the water was provided at a fixed rate, subject to annual adjustments. The amounts of water to be provided were:

- City of Hemet: 6.39% of the greater of FMWC pumping or 9,000 AFY;
- City of San Jacinto: 0.38% of FMWC pumping; and
- LHMWD: 3.74% of FMWC pumping.

The reporting by EMWD since the purchase of FMWC shows that an average of approximately 10,000 AFY was pumped from FMWC wells. Of this total, an average of 61% was from Upper Pressure, 33% was from Canyon, and 6% AFY was from Hemet South.

2.3.2 HEMET/SAN JACINTO GROUNDWATER ASSOCIATION

The Hemet/San Jacinto Groundwater Association (Association) was formed in 1991 to provide an over-arching organization to proactively address groundwater issues in the Management Area. The Association Board of Directors included representatives from the Private Water Producers, EMWD, LHMWD, and the Cities of Hemet and San Jacinto.

The Mission Statement and Articles of Association were approved on September 9, 1991. The Mission Statement read: *The Hemet/San Jacinto Groundwater Association serves as the regional groundwater management entity for portions of the San Jacinto Valley groundwater basins. The Mission of the Association is to maintain a secure reliable and reasonably priced supply of high quality water for groundwater producers in the basin. The Association will implement its Mission by developing and applying sound groundwater basin management concepts.*

With regard to the area covered by the Association, the Articles of Association state: *The portions of the San Jacinto Valley Groundwater Basins shall include the Canyon area, the Intake area, and the upper pressure area, of the San Jacinto Hydrologic Subarea; the Hemet Hydrologic Subarea; and a portion of the Winchester Hydrologic Subarea. Such also being that portion of the San Jacinto Valley southeasterly of Bridge Street and northeast of one-quarter mile west of California Avenue in the area of Simpson Road, together with tributary basins, streams, and watersheds.*

In May 1994, following receipt of the Soboba Band of Mission Indians water rights settlement claim, requests were submitted to the U.S. Department of the Interior by EMWD, the Association, and the Soboba Tribe, to appoint an Indian Water Rights Settlement team to participate in settlement negotiations. The activities of the Association stopped when the current negotiations took precedence.

2.4 ACTIVE INSTITUTIONAL BODIES

As part of the on-going activities leading to the development and adoption of the Principles, the Stipulated Judgment, and agreement with the Soboba Tribe, the following institutional bodies are formed:

- Hemet/San Jacinto Policy Committee (PC),
- Hemet/San Jacinto Technical Committee (TC), and
- Hemet/San Jacinto Consultant-Attorney-Managers Committee (CAM).

Following is a brief description of each body, their role, and participants.

2.4.1 HEMET/SAN JACINTO POLICY COMMITTEE

The PC is comprised of elected officials representing EMWD, LHMWD, the Cities of Hemet and San Jacinto, and representatives of the Private Water Producers. Each entity, including the Private Water Producers, has three representatives on this committee. In the case of the Public Agencies, the PC representatives are two members of the Board of Directors or City Council and the agency or city manager. Three representatives reflecting the Private Water Producers interests (agricultural, dairy, golf course, etc.) are selected by the Private Water Producers. Each entity participates and votes as a unit in the PC. The decision making process is based on consensus. DWR provides a facilitator, a project manager, and technical experts to support and facilitate the decisions of the PC and TC members. Observers to the PC include other Private Water Producers, attorneys, and/or consultants representing various members, and representatives of the Soboba Tribe.

The list of participants in the PC at the time of adoption of this Plan is presented in Appendix E.

2.4.2 HEMET/SAN JACINTO TECHNICAL COMMITTEE

The PC formed a TC to compile, share, interpret, evaluate, and reach agreement on data; to define problems; and to address the PC's technical issues and make recommendations to the PC. Committee membership consists of representatives assigned by the Public Agencies, the Private

Water Producers, and DWR and an engineering consultant provided by DWR as a neutral third-party participant. The representative from LHMWD served as the TC chairman. Through a collaborative effort, the TC developed the data set (WRIME, 2003a) that provides the basis for understanding the area's hydrology, and has identified potentially feasible initiatives, programs, and projects to enhance the safe yield of the Management Zones.

The list of participants in the TC at the time of adoption of this Plan is presented in Appendix E.

2.4.3 HEMET/SAN JACINTO CONSULTANT-ATTORNEY-MANAGERS COMMITTEE

The PC formed the CAM Committee, consisting of technical, legal, and management representatives of each Public Agency, assisted by the DWR project manager and facilitator. The role of the CAM Committee is to facilitate the preparation of technical and legal documents in support of the Stipulated Judgment, the Agreement, and the Plan. Tasks assigned to the CAM Committee include: the development of contractual agreements and MOUs, and the evaluation of the financial impacts to the community for consideration and action by the PC. The CAM Committee provides administrative or policy recommendations to the PC.

The list of participants in the CAM Committee at the time of adoption of this Plan is presented in Appendix E.

2.5 RELATED GROUNDWATER MANAGEMENT ACTIVITIES

There have been numerous investigations and technical analyses conducted in the Management Area. This section highlights more recent reports that were produced to support the Plan, reviewed by the TC, and used by the PC to make decisions. There has been a significant amount of work completed by the local agencies documented in the form of presentations to the PC and the TC. These include:

- Analysis of EMWD Fruitvale water transfer and use by other agencies;
- Analysis of Conveyance (export) water from the Management Area;
- Reconciliation of the Groundwater Production records amongst the participants;
- Estimation of basin overdraft;
- Review and assessment of the San Jacinto Watershed Groundwater Model; and
- Recycled water use and activities.

A Basin Assessment Study was undertaken in 2003 by the local stakeholders with the support of DWR in order to evaluate the existing conditions of the Management Area, evaluate likely future conditions, and develop and evaluate potential conjunctive use opportunities in the

Management Area. To support the Basin Assessment Study, the following Technical Memoranda (TM) and reports were produced:

- *Operational Yield Study, Hemet/San Jacinto Groundwater Management Area (WRIME, 2003d);*
- *Technical Memorandum No. 1 (TM1), Assessment of Historical and Projected Land and Water Use Data (WRIME, 2003a);*
- *Technical Memorandum No. 2 (TM2) - Description of Preferred Potential Conjunctive Use Projects (WRIME, 2003c);*
- *Basin Assessment Study Executive Summary (ES) (WRIME, 2003b); and*
- *Draft Technical Memorandum No. 3 (TM3) - Analysis of Impacts of Conjunctive Use Projects (January 2004).*

The *Operational Yield Study, Hemet/San Jacinto Groundwater Management Area* presents estimates of the operational yield of the Management Area. Several time periods were used to examine the water budgets of each Management Zone and the Management Area as a whole under various hydrologic conditions. The purpose of the report was to review the previous estimates of hydrologic water budget and reconcile differences in the previously prepared water budgets, and to achieve a consensus on the assumptions, data, methods, and yield of the basin. The long-term period of 1958-2001 was used since it had the best available data at the time and represented a balanced hydrologic period, with wet, dry, and normal periods similar in frequency to the overall historical record.

Hemet/San Jacinto Basin Assessment Study – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 1 (TM 1), Assessment of Historical and Projected Land and Water Use Data presents background and available data, and analyzes the quality and utility of the data for evaluating basin conditions. The data presented in TM 1 include historical groundwater production, water diversions, water sales, and imported water. The purpose of the report was to obtain agreement on existing conditions, document assumptions, and provide a baseline for purposes of future comparison.

Hemet/San Jacinto Basin Assessment Study – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 2 (TM 2), Identification and Description of Potential Conjunctive Use Projects presents the process and basis of selection of sites for further evaluation for potential conjunctive use projects. Seven sites were selected from an initial group of 15. The sites were ranked based on screening criteria that included: general site characteristics (size, recharge needs, ownership, etc.), recharge water sources, hydrogeologic suitability, sub-basin interactions, engineering suitability, land use suitability, and environmental impacts. An initial screening was also performed for two potential in-lieu projects.

Hemet/San Jacinto Basin Assessment Study – Executive Summary provides a summary of TM 1 and TM 2.

Draft Hemet/San Jacinto Basin Assessment Study – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 3 (TM 3), Analysis of Impacts of Conjunctive Use Projects (January 2004) presents a summary of available information on seven potential recharge sites and two potential in-lieu sites for conjunctive use. Draft TM 3 synthesizes information from multiple sources to compare potential recharge sites and proposes preferred sites and documents any additional study or data needs. The TM 3 was presented to the TC in draft form, and comments were received. Due to initiation of the development of the Water Management Plan, the work to finalize TM 3 was re-scoped, which obviated the need to prepare a final TM 3.

Significant other work has been performed and documented by EMWD. These reports include planning documents and feasibility studies with modeling efforts:

- *West San Jacinto Groundwater Basin Management Plan;*
- *Hemet/San Jacinto Water Management Area 2004 Annual Report;*
- *Hemet-San Jacinto Recharge and Recovery Program- Feasibility Study;*
- *Regional Groundwater Model for the San Jacinto Watershed;*
- *Hemet-San Jacinto Integrated Recharge and Recovery Program- Feasibility Study Groundwater Flow Model;*
- *Lake Elsinore and Canyon Lake Nutrient Source Assessment;*
- *Groundwater Infiltration Predictions Using Surface Water Model Output for the San Jacinto Watershed;*
- *Development of the Regional Water Resources Database (RWRD); and*
- *Preliminary Design Report for the San Jacinto Agricultural In-Lieu Water Supply Project.*

West San Jacinto Groundwater Basin Management Plan (EMWD, 1995). This plan was prepared in accordance with Assembly Bill 3030. This groundwater management plan covers the western portion of the EMWD service area in the San Jacinto Watershed. Since the groundwater management in the eastern San Jacinto watershed was being developed under Association in the early 1990s, the Management Area was excluded from the AB3030 planning process. The goal of the West San Jacinto Groundwater Basin Management Plan is “to maximize the use of groundwater for all beneficial uses 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” (EMWD, 2004). Implementation of the plan included the establishment of an Advisory Committee; Management Zone prioritization; and

groundwater resources evaluation including groundwater quality and level monitoring, extraction monitoring, and hydrogeophysical investigations.

Hemet/San Jacinto Water Management Area 2004 Annual Report (EMWD, 2005b). As part of the reporting process to the Management Area stakeholder group, EMWD produces annual reports that summarize groundwater quality, level, and extraction monitoring results, and provide an update on activities and progress toward meeting the previous year's recommendations and goals of the groundwater management plan. The first annual report for the Hemet/San Jacinto Area was produced in June 2005.

Hemet-San Jacinto Recharge and Recovery Program- Feasibility Study (Psomas, 2003). This report documents the feasibility of a proposed recharge project. The proposed Hemet/San Jacinto Integrated Recharge and Recovery Program consists of average annual recharge of 43,750 acre-feet (AF) based on long-term hydrology at a site within the City of Hemet and near the San Jacinto River's confluences with Poppet and Bautista Creeks. This program involves the construction of approximately 15 recharge ponds on a 100-acre site in the San Jacinto River channel, construction of new pipeline facilities, upgrade of existing pump stations, and construction of new extraction wells at various locations within the Management Area. In order to assess the feasibility of the proposed program, a comparative analysis was completed to evaluate potential alternatives to the preferred option of recharging imported water.

Regional Groundwater Model for the San Jacinto Watershed (TechLink Environmental, 2002a). This report documents the development of a regional groundwater flow and transport model for the San Jacinto watershed basin within EMWD's service area, an area that includes the Management Area as well as the areas to the west included in the *West San Jacinto Groundwater Basin Management Plan*. *Regional Groundwater Model for the San Jacinto Watershed* includes review of available data, development of a conceptual model, setup of a flow and transport model, calibration of the model, and simulation of management scenarios.

Hemet-San Jacinto Integrated Recharge and Recovery Program - Feasibility Study Groundwater Flow Model (TechLink, 2002b). This report documents the application of the regional groundwater model to evaluate the various recharge and recovery activities and alternative water supplies. These model simulations are intended to compare project and no-project alternatives, evaluate the aquifer capability to store large volumes of water, and evaluate the availability of recharged water for extraction.

Lake Elsinore and Canyon Lake Nutrient Source Assessment (TetraTech, 2003). TetraTech developed a watershed model of the San Jacinto watershed for the Lake Elsinore and San Jacinto Watershed Authority and the RWQCB as part of the Lake Elsinore and Canyon Lake Nutrient Source Assessment. The model provided a framework for nutrient source assessment through representation of contributing land uses in a subwatershed network and subsequent

determination of required nutrient load reductions and allocations to Total Maximum Daily Load (TMDL) objectives. Relating to the Management Area, the report showed that nutrients from the Management Area only reach the lakes when Mystic Lake overflows.

Groundwater Infiltration Predictions Using Surface Water Model Output for the San Jacinto Watershed (TetraTech, 2004). This report documents the update and modification of the watershed model by TetraTech to support EMWD's development of a groundwater model of the San Jacinto River basin to simulate aquifer storage in the region. The update and modification included extension of the modeling period from January 1984 to March 2003, division of one subwatershed into 4 subwatersheds, and modification of model output. The model was validated and scenarios were run.

Regional Water Resources Database (EMWD, 2005c). A RWRD was developed for EMWD in 2004 to house the existing and future groundwater-related records and to interface Geographic Information System (GIS) maps and aerial photographs. The RWRD contains information for groundwater levels and extraction; streamflow and diversions; well information, construction data, downhole logs, and well/aquifer pump tests; precipitation; temperature; evaporation; imported water usage and quality; conjunctive use; and water quality data from other laboratories and published reports. While no formal document is available to-date describing the full development and implementation of this project, *Regional Water Resources Database* presents a concise summary of the capabilities of this important component of data management in the region.

Preliminary Design Report for the San Jacinto Agricultural In-Lieu Water Supply Project (Engineering Resources of Southern California, 2005). This report details how recycled water could be incorporated into existing irrigation infrastructure and how to be consistent with the regulatory constraints associated with recycled water use. This included study of water demands, pipeline alignment and size, and environmental issues and resulted in the development of a preliminary plan and cost estimate. The preliminary plan included 13,200 feet of 24-inch pipeline serving Rancho Casa Loma and Scott Brothers Dairy Farms. Total irrigation demand from these farms is estimated at 8,640 AFY. Of this amount, the project could deliver 3,215 AFY due to limited availability of recycled water during the summer months. The project is estimated to take 13 months to complete.

The elements of this Plan include water management goals and a set of management strategies that discuss and identify the actions necessary for meeting the goals.

3.1 MANAGEMENT PLAN GOALS

The Plan has eight primary goals derived from the Principles and the Agreement. Each of the goals, listed below, is briefly discussed in subsequent sections:

- Address pumping overdraft and declining groundwater levels,
- Provide for Soboba Tribe prior and paramount water rights,
- Ensure reliable water supply,
- Provide for planned urban growth,
- Protect and enhance water quality,
- Develop cost-effective water supply,
- Provide adequate monitoring for water supply and water quality, and
- Supersede the Fruitvale Judgment and Decree.

3.1.1 ADDRESS PUMPING OVERDRAFT AND DECLINING GROUNDWATER LEVELS

The Principles and the Stipulated Judgment recognize that groundwater levels within the Management Area have generally been declining for a number of years, and that the Management Area is presently in a condition of groundwater overdraft. The amount of groundwater overdraft is estimated to range from 10,000 to 15,000 AFY. This Plan has a goal of reducing the overdraft in the short-term, and completely eliminating the annual overdraft in the long-term. The timeframe will depend on the extent of overdraft, as more knowledge is gained through the years. For example, a six-year period would be needed to eliminate overdraft if there is an annual overdraft of 10,000 AF.

The Principles identify management strategies to be included in the Plan to reduce overdraft and ensure a long-term supply of reliable water for current and future uses. The Plan contains both management (non-structural) and capital facility (structural) elements to reduce demand and/or increase the available supply. The management elements include: reduction in native groundwater production; enhanced recharge with local runoff, imported, and/or recycled water; and water conservation programs. Short-term planned reductions in pumping are part

of the Plan while further supplies are obtained through the identified management elements. The management strategies are described in more detail in Section 3.2.

3.1.2 PROVIDE FOR SOBOBA PRIOR AND PARAMOUNT WATER RIGHTS

The Agreement with the Soboba Tribe provides for financial obligations, settlement of all water rights claims, and water purchases from MWD, including infrastructure and groundwater storage. The Plan requires that all parts of the Agreement with the Soboba Tribe be met. The management elements to ensure this include: recognition of 9,000 AFY of Soboba Tribe water rights and up to 4,100 AFY of water use in Canyon and Upper Pressure Management Zones for the first 50 years from the date of Settlement, purchase of replenishment water, and MWD's long-term average delivery of 7,500 AFY of imported water.

3.1.3 ENSURE RELIABLE WATER SUPPLY

Reliability is a key component of any water supply system. This goal of the Plan is to ensure that the Public Agencies have a consensus and commitment to develop a comprehensive water supply portfolio that realizes all potential opportunities, and that plans are in place to adapt to changing demands, natural disasters, and drought conditions. Such a portfolio should rely on a range of sources of water supply and include a large component of local supply and storage. These objectives minimize, to the extent possible, reliance on weather patterns, over-stressed aquifers, and over-allocated imported water. The Plan elements that address these goals include imported and recycled water use.

3.1.4 PROVIDE FOR PLANNED URBAN GROWTH

The Management Area, like much of the Inland Empire area of Southern California, is experiencing dramatic urbanization. The Principles and the Plan recognize and acknowledge that the Management Area will continue to experience residential, commercial, and industrial growth and development, and that the existing water production and service systems will need to be expanded to meet this growth. This urbanization will affect water supplies in several ways. Urban development on non-irrigated lands will increase water use. Urban development and conversion of irrigated lands may not significantly increase water use, but the urban water use requires a more dependable, higher quality water supply. It is estimated that at least 15,000 AFY incremental water supply capacities over the existing Base Production Rights of Public Agencies must be dedicated to adequately serve this growth. The Plan will help local communities comply with recent changes in state law effective January 2002 (SB 221 and SB 610) requiring municipal suppliers, water districts, and cities or counties to document water availability from all sources in normal, dry, and multiple dry years whenever land use decisions

are made. Planned urban growth, as identified in prevailing land use and general plans, or in approved Urban Water Management Plans (UWMP), provided the basis for all demand forecasts and assumptions in the Plan.

3.1.5 PROTECT AND ENHANCE WATER QUALITY

The Management Area has some of the highest quality groundwater in the San Jacinto Watershed, but it has its own problems and issues. Nitrates and Total Dissolved Solids (TDS) concentrations have historically increased as the area experienced urban and agricultural growth. As noted above, urban uses will replace agricultural uses, resulting in more stringent water quality standards for most constituents, including nitrates. The Plan seeks to meet goals for water quality through preventing degradation of the groundwater due to activities in the Management Area, and as a result of implementation of the Plan. Each of the Public Agencies also seeks to prevent degradation or to improve groundwater quality to avoid high costs for drinking water treatment.

3.1.6 DEVELOP COST-EFFECTIVE WATER SUPPLY

Equitable distribution of costs and benefits are part of the Plan. It is important that the Plan elements are selected and implemented in a way that keeps costs to a minimum so as to keep water bills as low as possible for customers. Cost management includes purchasing imported water at low rates; utilizing groundwater storage space; fully utilizing existing infrastructure; promoting conservation; efficiently implementing new infrastructure; and maintaining good quality groundwater and surface water to keep treatment costs low. The Public Agencies also seek to cost-effectively reclaim municipal wastewater for beneficial reuse whenever possible.

3.1.7 PROVIDE ADEQUATE MONITORING FOR WATER SUPPLY AND WATER QUALITY

Monitoring programs will be implemented to determine if the Plan's goals are being met; to document that anticipated benefits are being achieved; and to predict future needs. Included in the monitoring should be water quality, sampled at sufficient locations to be representative, with analysis for all constituents of concern. In addition, the monitoring program should include monitoring of water levels, well metering, and tracking of imported water and recycled water availability and deliveries. Monitoring can also be used to improve yield estimates and groundwater model performance through the development of better estimates of stream recharge and other components. The results of monitoring will be used to strengthen or relax actions needed to meet Plan goals.

3.1.8 SUPERSEDE THE FRUITVALE JUDGMENT AND DECREE

The Fruitvale Judgment and Decree (The City of San Jacinto, et al., v. Fruitvale Mutual Water Company, et al., No. 51546, Riverside County) was entered into Book 72, Page 164 of Judgments, Riverside County, on June 4, 1954. EMWD, as successor in interest to FMWC, is subject to the provisions of the Judgment and Decree. Provisions in the document are discussed and summarized in Section 2 of this Plan. The Stipulated Judgment and its Water Management Plan are to supersede the Fruitvale Judgment and Agreement subject to certain exceptions in Section 3.5 of the Stipulated Judgment.

3.2 WATER MANAGEMENT PLAN STRATEGIES

To meet the stated goals of the Plan, the stakeholders have adopted the following specific strategies.

3.2.1 REDUCE PUBLIC AGENCY NATIVE GROUNDWATER PRODUCTION

The Public Agencies have agreed to reduce native groundwater production so that total production is within the Safe Yield of the Management Area. The average annual groundwater production in the Management Area for the hydrologic period 1958-2004 is estimated to be 54,800 AFY. The initial estimate of Safe Yield is 45,000 AF. The Public Agencies have also agreed to a 10% reduction from each Base Production Right in the first full year after entry of the Stipulated Judgment. The Public Agencies' share of Safe Yield is calculated based on their Adjusted Production Right, and is discussed further in Section 11. Within the first six years, the Watermaster will make a determination of the Safe Yield of the Management Area. Thereafter, the Safe Yield shall be reviewed and modified, if necessary, upon the recommendation of the TC or as the Watermaster may determine. Until Adjusted Production Rights are consistent with the Public Agencies' share of Safe Yield, the Watermaster will determine the required reductions in Adjusted Production Rights in each subsequent year to achieve Safe Yield within a reasonable period of time as determined by the Watermaster. The Watermaster is to consider the extent of the overdraft, the economic impact on the parties bound by this Judgment, and other relevant factors in determining the total and pro-rata shares of Adjusted Production Rights. The goal is to achieve production at the same level as Safe Yield over a six-year period assuming an annual overdraft of 10,000 acre-feet. In the event the extent of the overdraft is different than assumed, then the period of time reasonably required to reach Safe Yield may be extended or reduced accordingly. However, in no event shall any reduction for any Public Agency be more than 10% of the Adjusted Production Rights of the prior year.

3.2.2 IMPLEMENT THE SAN JACINTO RIVER RECHARGE AND RECOVERY PROJECT

The stakeholders have agreed that Phase I of the IRRP is the primary project considered to be the core of the Physical Solution. The stakeholders are working towards an agreement for Phase I of the IRRP project which documents their agreement on the ownership, financing, and operation of the facilities.

The information presented here is based on previously published documents adjusted when appropriate based on the latest knowledge at the time of publication of the Plan.

Phases I and II of the IRRP are designed to recharge (replenish) imported water and extract groundwater at a capacity such that the following goals are met:

- Satisfy the Tribe's prior and paramount rights as set forth in the Agreement with the Tribe by providing an average annual supply of 7,500 acre-feet pursuant to the terms of such agreement. The proposed Program would provide the MWD with the right to store up to 40,000 acre-feet of imported water in the Upper Pressure Sub-basin as advance deliveries under its agreement to provide an average annual supply of 7,500 acre-feet.
- Offset the existing overdraft of the Management Area, estimated at approximately 10,000 AFY.
- Provide approximately an additional 15,000 AFY of water storage to help meet projected demand increases.

Major elements of Phase I of the Project are (Figure 3.1):



- Modifications to Pump Stations (Warren and Commonwealth);
- Construction of Pipelines;
- Design and Construction of Recharge Basins;
- Drilling Three (3) Extraction Wells;
- Installation of Pumps and Chlorination Equipment for Three (3) Extraction Well; and
- Design and Installation of Three (3) Monitoring Wells.

The project is designed and implemented in two Phases. While project Phase I activities are defined in detail, Phase II of the project is defined at conceptual level and the detailed design will be developed in the future.

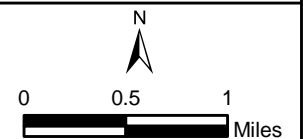
Hemet / San Jacinto
Water Management
Plan
**Schematic of Integrated
Recharge Recovery
Program - Phase I**

Figure 3.1

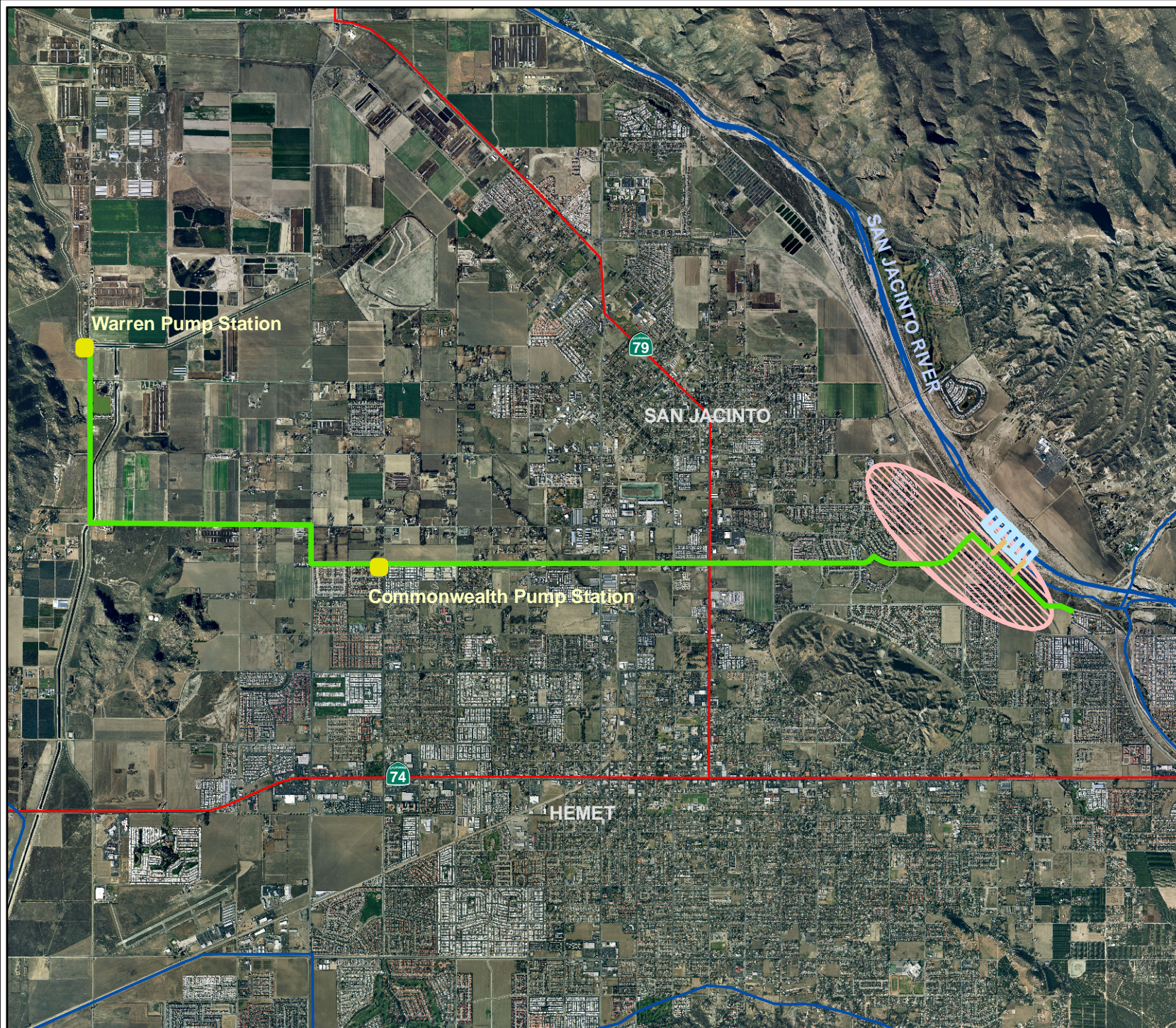
Legend

-  Pump Station
-  Phase I Pipeline
-  Phase I Ponds
-  Existing Pipeline
-  Phase I Well Field

Source: EMWD



October 2007



3.2.2.1 Phase I

This phase of the project consists of the construction of the San Jacinto Integrated Recharge and Recovery Project, which will provide up to 42 cubic feet per second (cfs)* of recharge water capacity. Phase I is scheduled to be completed by December 2008*, and will cost approximately \$16.2* million. Major activities during Phase I are:

1. **Completion of Environmental Process** - The Environmental Impact Report (EIR) was prepared and adopted in August of 2004. Additional permitting requirements include Section 7 consultation with USFWS and issuance of Biological Opinion by the appropriate federal agency.
2. **Acquisition of Land** - A 100 acre parcel has been purchased by EMWD for required habitat mitigation measures for a 35 acre* parcel that is dedicated to recharge basins. In addition, EMWD is in the process of acquiring approximately one acre of land (in several parcels) for monitoring wells.
3. **Approval, Advertising, and Award of Construction Contract** - The EMWD Board of Directors has approved the bidding process.
4. **Drilling of Extraction Wells No. 1, 2, and 3** - This includes construction and testing of three 18-inch diameter extraction wells, each to a depth of approximately 1,000 feet.
5. **Installation of Pump and Chlorination Equipment for Wells No. 1, 2, and 3** - This includes installation of pump and chlorination equipment, appurtenances and site improvements required to complete and operate the new extraction wells.
6. **Modifications to the Pump Station** - This includes modifications to the Warren and Commonwealth Pump Stations. The modifications include upgrades to increase pump station capacity to provide a seasonal maximum of 42 cfs* to the recharge basins.
7. **Construction of Recharge Basins** - This activity includes construction of six recharge ponds within the San Jacinto river bed in two clusters of three ponds each. The footprint of the recharge area will be approximately 35 acres*, along the west side of the San Jacinto River, immediately upstream of the river confluence with the Meridian Channel.
8. **Construction of Pipelines** - This includes design and construction of pipelines and appurtenances to convey, regulate, and meter raw imported water flows into the recharge basins. Pipelines include two (2) 24-inch diameter laterals to convey water from an existing 33-inch diameter transmission main along the proposed Ramona Expressway alignment to the first basin in each of the two basin clusters. There will be appurtenances including regulation valves, meters to record water

* Number has been updated since the publication of the IRRP Feasibility Report.

flow, telemetry-based flow control systems, and discharge piping into the recharge basins.

9. **Design and Construction of Monitoring Wells** - Three monitoring wells will be constructed outside the river bed along the west berm. The wells are designed to monitor the vertical and lateral migration of recharge water into the underlying aquifer zones. These clustered wells will be multi-cased and perforated to monitor the groundwater levels at various depths.

The overall project size may change as a result of negotiations with regulatory agencies.

3.2.3 IMPLEMENT GROUNDWATER REPLENISHMENT PROGRAM

The groundwater aquifers in the Management Area are a valuable resource and provide many advantages to operating a reliable water supply system. For many Private Water Producers, groundwater is their sole source of water. Declining water levels increase costs for pumping water and can also cause wells to go dry, requiring deeper drilling, or can result in the intrusion of poor quality groundwater from neighboring Management Zones, rendering the groundwater unsuitable for many beneficial uses. Also, the replenishment of high quality imported water from the State Water Project or high quality runoff from the surrounding mountains can maintain or improve the quality of the groundwater in the Management Area.

Groundwater replenishment, therefore, is a major part of the water management strategies considered by the stakeholders. Replenishment efforts to increase water supply in the Management Area can be grouped into two categories:

1. Direct replenishment of groundwater to store water for future use; and
2. Augmentation of imported or recycled water supplies to provide immediate increases in water supply and the associated decrease in groundwater pumping. Often, these categories are combined, with increases in imported or recycled water being used to replenish groundwater for future use.

3.2.3.1 Enhancing Natural Replenishment

The Management Area already receives a significant amount of natural recharge, from sources such as direct recharge from precipitation and infiltration from the San Jacinto River and its tributaries. While much of this water is able to infiltrate naturally, natural recharge could be increased by capturing surface flows during storm events, allowing the water to infiltrate over time rather than be swept out of the Management Area. As part of the Basin Assessment Study, the TC has identified and considered several conjunctive use and natural replenishment projects that have the potential to address such a water supply management strategy. These are described in Section 5.3 of the Plan.

3.2.3.2 Additional MWD Replenishment Water

Utilizing replenishment allows for significant cost savings when purchasing imported water from MWD. MWD provides special rates for water used for replenishment purposes. This water is available during the low-demand winter period and currently costs \$238/AF for untreated water, while full-service Tier 1 & 2 untreated water currently costs \$331/AF and \$427/AF, respectively.

3.2.4 EXPAND THE USE OF RECYCLED WATER

Recycled water is available from EMWD's San Jacinto Valley Regional Water Reclamation Facility. Currently, recycled water is used by agricultural users and other large-scale outdoor irrigators such as golf courses and municipal facilities in place of groundwater. The Watermaster will use recycled water as a significant part of its water supply strategy for replenishment of the groundwater basin. The Watermaster will work with EMWD to determine the operational constraints currently facing the availability of recycled water for replenishment of the basin. The recycled water is to follow the State and Federal guidelines. Future phases of the Plan include upgrade of the San Jacinto Valley Regional Water Reclamation Facility to tertiary treatment.

3.2.4.1 Continue and Expand the In-Lieu Replenishment with Recycled and/or Imported Water

In-lieu replenishment with recycled and/or imported water provides many benefits over direct replenishment of the groundwater. In-lieu involves utilizing an alternate source, in this case imported or recycled water, instead of pumping groundwater. Using in-lieu recharge means that there is no cost to pump groundwater, no land is needed for a spreading basin, and there is no constant recharge through a basin to push salts out of the unsaturated zone. Disadvantages include timing of the supplies with demand; that is, most in-lieu customers cannot use the quantity of water available during the off-peak time. To maximize use of water available for in-lieu replenishment, significant infrastructure will be needed to serve the maximum number of customers. This strategy would require the Watermaster to work with EMWD, other agencies, and Private Water Producers to develop specific plans for expanding the use of recycled water for in-lieu replenishment of the basin.

3.2.4.2 Expand and Upgrade the San Jacinto Valley Regional Water Reclamation Facility

The San Jacinto Valley Regional Water Reclamation Facility is currently an 11 MGD plant with capability to treat wastewater to a secondary level of treatment. While this plant is scheduled for upgrade to tertiary treatment, the recycled water discharge beyond the sale to the agricultural customers is currently being disposed of in the basin. The plant is scheduled for expansion in size and upgrade of the treatment level, and the upgraded plant will have the capacity to treat 14 MGD by 2011 and 18 MGD by 2024. The Watermaster shall have the right of first refusal to purchase all recycled water produced from the treatment facilities serving the Management Area that is not subject to then existing contracts. The Watermaster will analyze the need and decide on the amount of recycled water for direct recharge and/or direct delivery.

3.2.5 PROVIDE FOR RELIABLE WATER SUPPLY TO MEET THE FUTURE DEMAND

The Plan is to provide sufficient water supplies to meet future water demands in the Management Area. This strategy is tied directly to the IRRP that is designed to provide 15,000 AFY of additional supplies to meet the projected water demands. As part of this strategy, additional conjunctive use projects, identified in Section 5.3 of this Plan, will augment Phase II of the IRRP. These projects are mostly designed to capture winter run-off for recharge, unlike the IRRP that is designed to recharge imported water.

3.2.6 IMPLEMENT ADDITIONAL WATER CONSERVATION MEASURES

The current level of water conservation has significantly helped to reduce the water demand in the Management Area. In addition to the conservation measures implemented by the Public Agencies, additional conservation measures can be designed and implemented by the agricultural and dairy water users. The Watermaster, in coordination with the Agencies, should develop specific strategies for additional water conservation. In addition, they should identify practical steps and means for voluntary implementation by the agricultural and dairy water users that would help water management of the basin.

3.2.7 IMPLEMENT AND EXPAND MONITORING PROGRAM

At the heart of any water management plan is a robust monitoring program capable of assessing the status of the basin and monitoring the responses to future management actions.

EMWD, on a voluntary basis, has compiled historical groundwater elevation and quality data from mid-1950s through the present. In the early data collection efforts, the location and

frequency of monitoring were not as consistent as the more recent measurements. This was mostly due to the voluntary nature of participation in the monitoring program, as well as funding availability. This lack of consistency in data collection hampers rigorous and thorough analysis. However, long-term hydrographs as well as contours of groundwater levels have been produced by EMWD to present long-term trends in groundwater conditions over time, and with appropriate geographic extent.

In 2004, the Hemet/San Jacinto Groundwater Monitoring Program was initiated to collect, compile, and analyze groundwater-related data. This program was undertaken by the Public Agencies and DWR. The monitoring program provides the information necessary for a comprehensive view of the Management Area, and contains the following elements:

- Groundwater Level Monitoring;
- Groundwater Quality Monitoring;
- Groundwater Extraction Monitoring; and
- Inactive Well Capping and Sealing.

Finally, the monitoring program utilizes EMWD's RWRD, for assembling and assessing groundwater-related data in the Management Area. All Public Agencies provide data on their wells and assist in communicating with private well owners in their respective jurisdictions to collect their data and information.

This strategy reconfirms that the monitoring program, as established in 2004, should continue and be expanded to new areas. The Stipulated Judgment requires that the Watermaster implement a monitoring program to ensure that Plan activities follow best management and engineering principles to protect Management Area water resources, and to compile and analyze data on groundwater production, water levels, water quality, and groundwater in storage. The Watermaster, in coordination with EMWD and other Public Agencies, will develop plans for expansion of the monitoring program, as well as, specific actions for implementation of the monitoring program in the Management Area. Funding for the monitoring program will come from the Administrative Assessment, as detailed in Section 10.3.1.

3.2.7.1 Groundwater Monitoring

Groundwater level and quality monitoring are valuable, but can be costly and time consuming. A robust network of monitoring wells can be established to develop the optimum amount of data on groundwater. Some criteria to be used in the development or modification of the network may include:

- Monitor the same well for selected seasons over many years to understand trends and variability;
- Develop an unbiased distribution of monitoring wells, aerially and vertically, that account for differences in:
 - Topography,
 - Geology and soils,
 - Climate, and
 - Land Use;
- Maintain supporting data to aid in analysis, including:
 - Meteorological data,
 - Hydrologic data, and
 - Land use data, including pumping and irrigation;
- Monitor at a frequency that captures variability of water level and water quality fluctuations;
- Utilize wells, to the extent possible, intended solely for groundwater monitoring, not production; and
- Maintain high levels of data quality.

The Watermaster is to work cooperatively with the Public Agencies and Private Water Producers to establish an optimum network of monitoring wells for collection and analysis of groundwater trends and variability.

3.2.7.2 Surface Water Monitoring

Surface water monitoring would build on the existing cooperative program between EMWD and the United States Geological Survey (USGS). This program monitors streamflow on the San Jacinto River just upstream of State Street and on Lamb Canyon Creek near Victory Ranch. The USGS also monitors a gage on the San Jacinto River at the Cranston Ranger Station. Continued and additional surface water flow and quality monitoring would include the following criteria:

- Monitor the same location for many years to understand trends and variability;
- Maintain supporting data to aid in analysis, including:
 - Meteorological data,
 - Groundwater data, and
 - Land use data, including pumping and irrigation; and
- Maintain high levels of data quality.

Gaging station should be installed on reaches not currently being monitored, such as:

- San Jacinto River near Main Street;
- San Jacinto River near Highway 74 bridge crossing;
- Bautista Creek near Highway 74 bridge crossing; and
- Salt Creek near State Street.

The Watermaster is to work cooperatively with the Public Agencies to establish specific monitoring locations for collection and analysis of surface water trends and variability.

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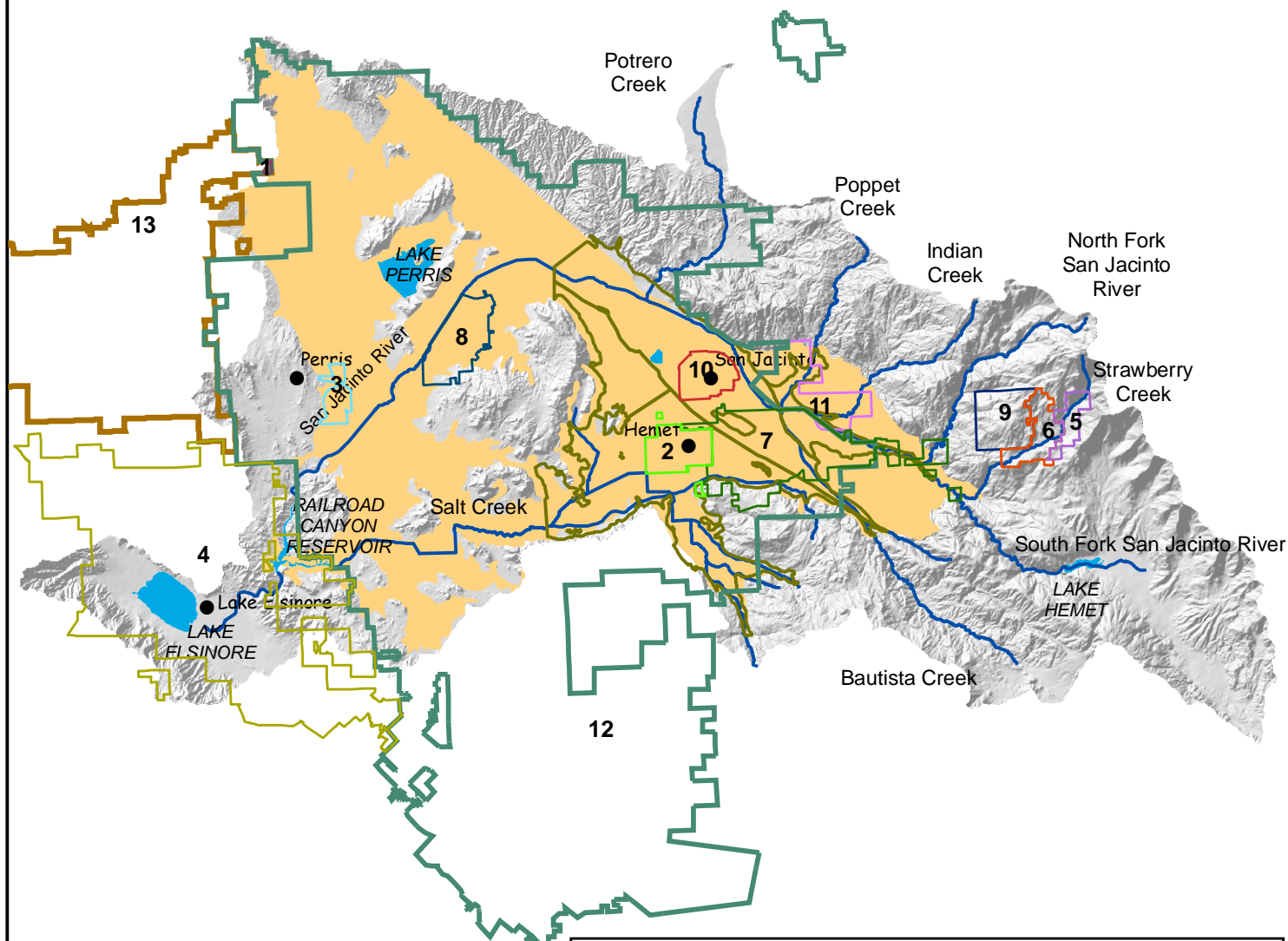
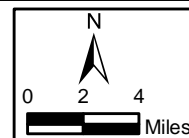
This section discusses the local geologic and hydrologic conditions that provide the foundation for the development of the Plan. The ability to manage available water supplies is to a large degree governed by naturally occurring conditions and the physical environment. This section further describes water supply conditions and sources; historical and current water demands; status of the groundwater basin; and summarizes water quality conditions.

4.1 GEOGRAPHY AND CLIMATE

4.1.1 GEOGRAPHY

The Management Area is located in western Riverside County, approximately 70 miles southeast of the City of Los Angeles. The area encompasses the Cities of Hemet and San Jacinto; unincorporated residential/commercial areas, including Valle Vista; and agricultural lands. State Highway 74 (Florida Avenue) crosses the valley in an east-west direction and State Highway 79 provides a north-south corridor for the region. The San Jacinto mountain range, to the east of the valley, is the dominant geographic feature of the region, rising to a height of 10,805 feet at Mount San Jacinto. Elevations on the valley floor range from approximately 1,400 to 1,800 feet. There are various bedrock outcrops in the area, none of which exceed 2,700 feet.

The San Jacinto Watershed (Figure 4.1) includes the Management Area and surrounding mountains and 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, flowing only when precipitation occurs and losing much of this flow to groundwater infiltration. The San Jacinto River arises in and drains the western slopes of the San Jacinto Mountains. Waterways tributary to the river include the North and South Forks and Strawberry, Indian, Poppet, and Bautista Creeks. Lake Hemet, located in the mountains on the South Fork of the San Jacinto River, is a 12,775 AF capacity LHMWD-operated reservoir completed in 1895. The San Jacinto River recharges the groundwater basin, primarily in the area southeast of the City of San Jacinto. It then occasionally flows northwest past the Lakeview Mountains, filling Mystic Lake, 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.



Legend

- San Jacinto Groundwater Basin*
 - Major Watercourses
 - Lakes and Reservoirs
 - Cities
 - Management Area
- Agency Boundary**
- 1 Box Springs Mutual Water Company
 - 2 City Of Hemet Water Dept.
 - 3 City Of Perris Water Dept.
 - 4 Elsinore Valley WD
 - 5 Fern Valley WD
 - 6 Idyllwild WD
 - 7 Lake Hemet MWD
 - 8 Nuevo Water Company
 - 9 Pine Cove WD
 - 10 San Jacinto Water Dept
 - 11 Soboba Indian Reservation
 - 12 EMWD
 - 13 Western Municipal WD

4.1.2 CLIMATE

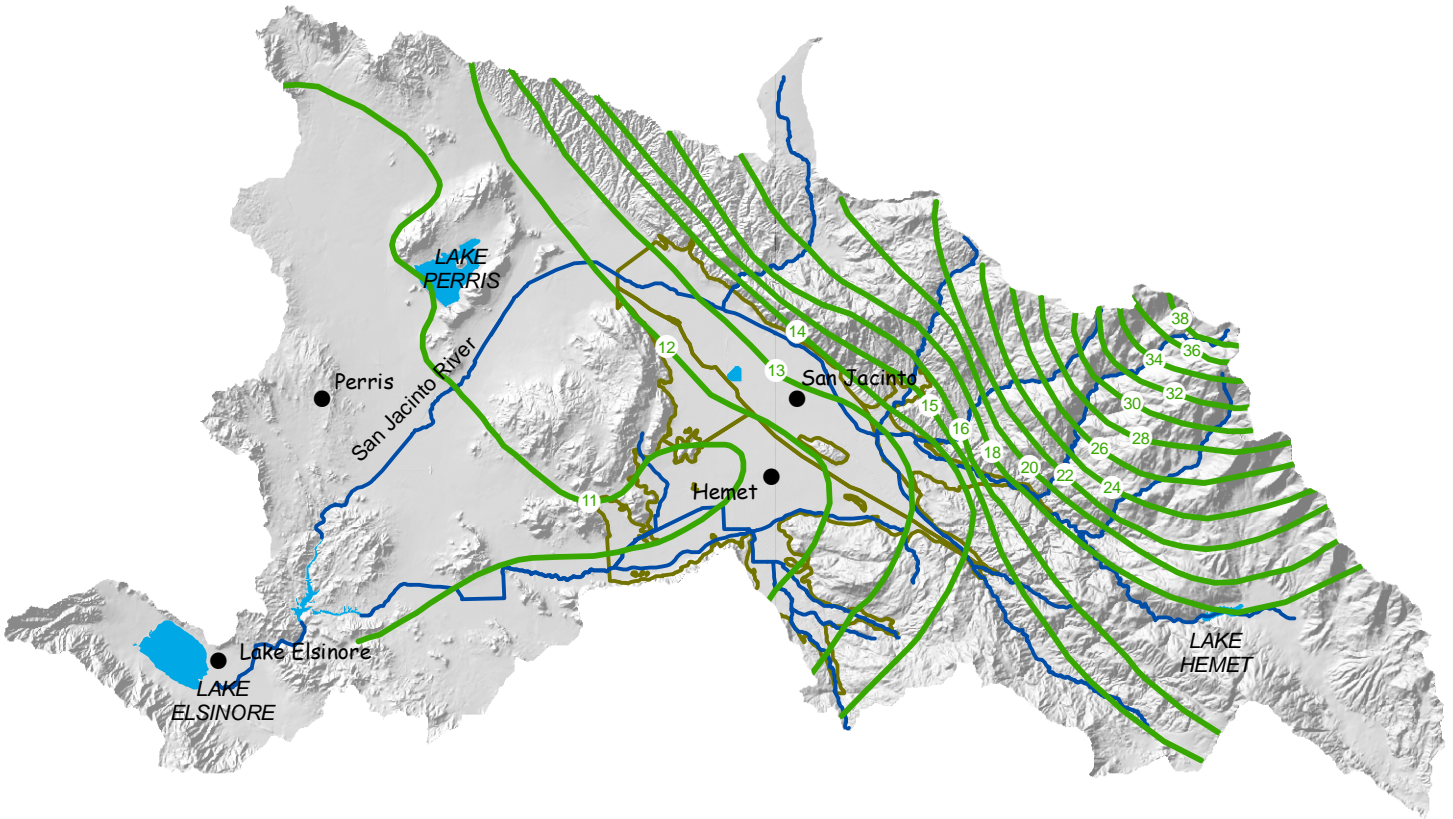
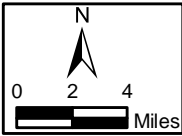
The climate of the area is that of a dry, semi-arid, near-Mediterranean zone, typical of the moderately elevated inland valleys of southern California. The climate is characterized by wet and dry seasons, generally low precipitation, and a large proportion of clear days, moderately high summer temperatures, and mild winter temperatures. The yearly average temperature at the City of San Jacinto is 62°F (25°C). Summer temperatures are often more than 100°F (38°C), and the recorded maximum at San Jacinto is 120°F (49°C). Frost occasionally occurs during the December through February period. The lowest recorded temperature was 7°F (-14°C). The average frost-free period is 247 days long, from March 15 to November 19. These temperatures for the San Jacinto climate station are considered to be generally representative of temperatures throughout the valley area.

Along with the rest of Southern California, the area is subject to the annual Santa Ana winds. Usually occurring in the fall of the year, these winds blow from the northeast, bringing hot, dry desert air with velocities of up to 50 miles per hour. Relative humidity has at times dropped below 5 percent with temperatures of 105°F (40°C) and higher. This phenomenon normally lasts only a few days, but has been known to last for several weeks, thereby greatly increasing the evaporation rate.

As a result of the hot, dry climate, the area has a high rate of evapotranspiration. Evapotranspiration is recorded as reference evapotranspiration (ET_o; evapotranspiration from a standardized grass surface) by the DWR's California Irrigation Management Information System. Reference evapotranspiration averages 57 inches per year and is highly seasonal, with an average monthly maximum of 7.9 inches in July and average monthly minimum of 2.0 inches in December (DWR CIMIS, 2006).

Virtually all precipitation falls in the winter months, with some summer thunderstorms. Topography generally controls the relative amounts of precipitation from one location to the next. The average precipitation on the valley floor is about 13 inches, but near Mt. San Jacinto, the average precipitation is approximately 40 inches. Figure 4.2 shows the distribution of precipitation in the watershed.

The Riverside County Flood Control and Water Conservation District (RCFC&WCD) currently maintains precipitation records from the National Weather Service precipitation gauge at the California Division of Forestry Station at 1st Street and San Jacinto Avenue in San Jacinto (Site #186). Annual San Jacinto precipitation totals for the 1850/51 through 2004/05 rain years (July – June) are shown in Figure 4.3. For the 155 years from July 1850 through June 2005, average precipitation equaled 13.12 inches; median precipitation was 12.13 inches; the year with



Legend

- Equal Precipitation (in)*
- Management Area
- Lakes and Reservoirs
- Major Watercourses
- Cities



Average Annual Precipitation

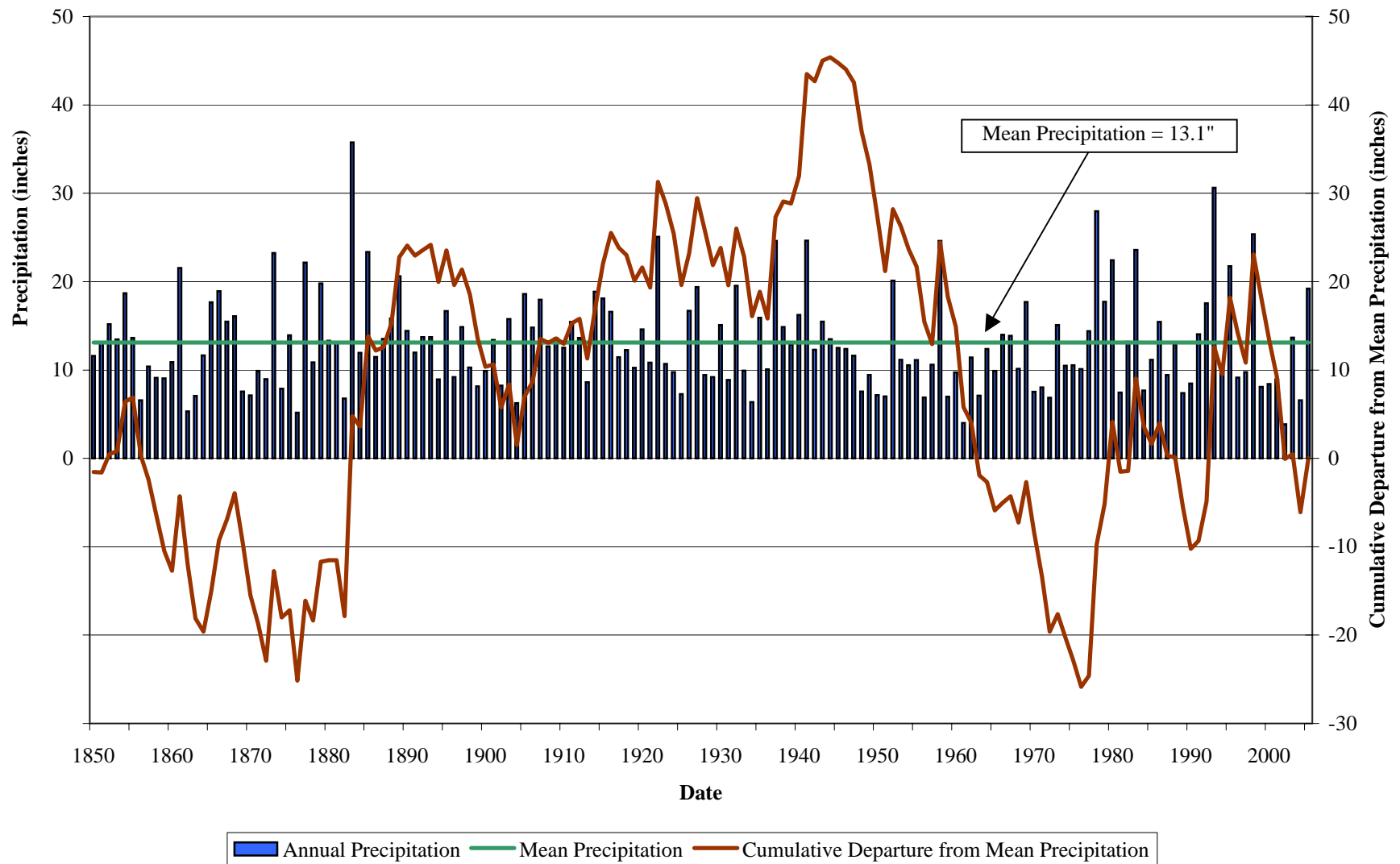
Hemet / San Jacinto Water Management Plan

*Source DWR, 1978
(1932 - 1964 data)

October 2007

Figure 4.2

Figure 4.3 Annual Precipitation and Cumulative Departure from Mean Precipitation



the highest precipitation was 1883/84 with 35.77 inches of rain; and the driest year was 2001/02 with 3.85 inches. Figure 4.3 also shows the cumulative departure from mean precipitation. This chart represents wet periods with increasing values, such as 1882-1890 and 1990-1998; normal periods with near-constant values, such as 1859-1881 and 1980-1988; and dry periods as decreasing values, such as 1944-1976 and 1999-2004.

4.2 SURFACE WATER CONDITIONS

The San Jacinto River and its tributaries are the primary surface water elements in the Management Area. This river and its tributaries provide water for direct use, artificial recharge, as well as for significant natural recharge to the groundwater system through the riverbeds. The San Jacinto River contains high quality water that flows from the mountain watershed and recharges groundwater. The river is a losing stream throughout the Management Area. Artificial and natural recharge of San Jacinto River water improves the overall quality and quantity of groundwater. Groundwater levels have been lowered over the years to the point where additional changes in groundwater levels has little or no impact on surface flows or vice versa, although in predevelopment conditions groundwater contributed to surface flows in swampy areas of the basin floor, particularly upgradient of faults.

EMWD and RCFC&WCD have partnered with USGS to monitor stream flows. USGS gaging stations along the San Jacinto River and its tributaries in the Hemet/San Jacinto and surrounding area are listed in Table 4.1, below.

In 1996, EMWD entered into a Cooperative Water Program Joint Funding Agreement with the USGS for a long-term water budget study in the San Jacinto area. As part of this project, the USGS installed two stream flow gages and three stage gages in the San Jacinto Watershed.

The USGS applied a rainfall-runoff model to estimate the water budgets for groundwater and surface water flows and to determine the hydrological effects of urbanization. The study used historical precipitation data with the model to produce a simulated long-term record of groundwater recharge and surface water runoff for a variety of potential urbanized conditions. The major objectives of the study were to:

1. Estimate groundwater recharge and surface water flows in the Canyon and Upper Pressure Management Zones;
2. Summarize the long-term water budget of the study area upstream of Mystic Lake; and
3. Determine the effects of urbanization in the study area.

Table 4.1 USGS Surface Water Gaging Stations

Station No.	Description:	Lat.; Long.*	Data Type	Time Frame
11069200	Lake Hemet WC up Canyon near San Jacinto	33°44'20"; 116°49'30"	Daily flows	1961-1991
11069300	WF San Jacinto Tributary near Valle Vista	33°43'20"; 116°48'00"	Peak flows Daily flows	1962-1973 1961-1967
11069500	San Jacinto River near San Jacinto (Cranston Ranger Station)	33°44'17"; 116°49'59"	Real time Peak flows Daily flows Water Qual.	1921-present 1920-present 1998
11069501	San Jacinto River near San Jacinto plus Canals	33°44'17"; 116°49'59"	Daily flows	1948-1990
11070000	Bautista Creek Near Hemet	33°41'40"; 116°51'00"	Peak flows Daily flows	1947-1969 1947-1969
11070020	Bautista Creek at head of Flood Channel in Hemet	33°42'42"; 116°52'04"	Peak flows Daily flows	1988-2003 1987-present
11070050	Bautista Creek at Valle Vista	33°44'04"; 116°53'33"	Peak flows Daily flows	1970-1987 1969-1987
11070150	San Jacinto River above State Street near San Jacinto	33°49'17"; 116°58'21"	Peak flows Daily flows	1997-present 1996-present
11070158	Line D Storm Drain at Santa Fe St. near San Jacinto	33°46'44"; 116°57'46"	Peak flows	1997-1999
11070160	Line E Storm Drain at Santa Fe St. near San Jacinto	33°46'41"; 116°58'18"	Peak flows	1997-1999
11070185	Lamb Canyon at Victory Ranch near San Jacinto	33°51'31"; 117°00'53"	Peak flows	1997-2004
11070190	Laborde Canyon near San Jacinto	33°51'44"; 117°01'29"	Peak flows	1962-1973
11070210	San Jacinto River at Ramona Expressway near Lakeview	33°50'23"; 117°08'06"	Real time Peak flows Daily flows	2001-present 2000-present

* The longitude and latitude measurements are published figures, but were estimated by the USGS from maps and, therefore, only have an accuracy of +/- 500 feet.

Five gages were installed upstream of Bridge Street in the San Jacinto basin area. Two stream flow gages were installed in the San Jacinto River, one at the State Street (Highway 79) crossing and the other at the Cranston Ranger Station. Three crest stage gages were installed in Potrero Canyon near San Jacinto, Lamb Canyon near San Jacinto, and at an urban runoff site.

Groundwater recharge in the Canyon and Upper Pressure Management Zones was calculated in addition to the surface runoff leaving the Management Area (including urban runoff) that reaches the Mystic Lake area. The study results are summarized in the USGS Water Resources Investigations Report 02-4090, *Rainfall-Runoff Characteristics and Effects of Increased Urban Density on Streamflow and Infiltration in the Eastern Part of the San Jacinto River Basin, Riverside County*,

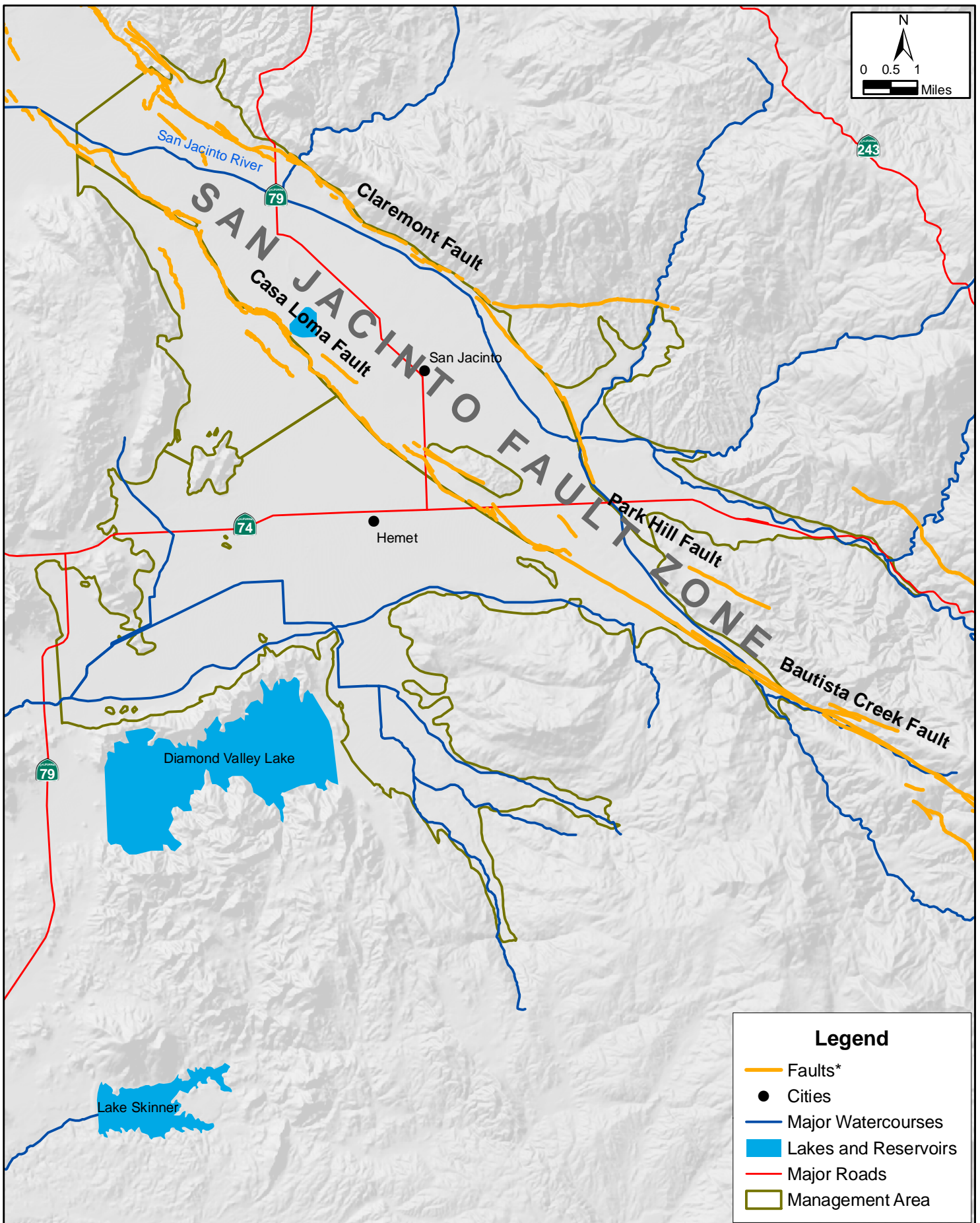
California. The report includes all measured, simulated, and statistical data used to support the conclusions of the study.

After the end of the study, some of the crest stage gages were no longer monitored and fell into disrepair. However, EMWD continues to fund, and USGS continues to operate, the stream gage on the San Jacinto River at State Street. The crest stage gage at Lamb Canyon Creek at Victory Ranch is still jointly funded by EMWD and USGS. For the 2005/2006 monitoring, the effort was funded as part of the Hemet/San Jacinto Monitoring Program by EMWD, LHMWD, and the Cities of Hemet and San Jacinto. The stream gage on the San Jacinto River at Cranston Ranger Station is currently funded and maintained by USGS and Riverside County Flood Control District with real-time data available on the USGS website.

4.3 GEOLOGY

The geology of the Hemet/San Jacinto area, relevant to groundwater supplies, has two primary features: a sediment filled graben, and the San Jacinto fault zone. The sediments in the graben provide for the majority of storage and movement of groundwater in the area and the movement of water is altered by the presence of the faults, which provide most of the internal boundaries for the area's Management Zones.

The Management Area partially contains a geomorphic feature known as a graben or fault-graben, along with additional permeable materials in alluvium-filled valleys. A graben is a depressed, trough-like structure in the Earth's crust, filled or partially filled with sediments, and usually formed by faulting and the relative downward movement of block-like geologic structures. The San Jacinto graben is a deep, sediment-filled structure approximately 2.5 miles wide and more than 20 miles long and forms the Upper Pressure Management Zone's boundaries in the Management Area. The Management Area, including the graben, is nearly surrounded by impermeable bedrock mountains and hills. Internally, island-like masses of granite and metamorphic bedrock or older alluvium rise above the valley floor. Surface and near-surface sediments in the graben and alluvium filled valleys are primarily sand and sandy silt with some silt and silty clay. The San Jacinto graben consists of a forebay area in the southeast where surface water recharge primarily occurs and a pressure area in the northwest where deep aquifers exist under confined conditions. The northwest-southeast oriented graben is formed by the right-slipping San Jacinto fault zone, believed to be the most seismically active in southern California. Between 1899 and the present, seven earthquakes of Richter magnitude 6.0 or greater have occurred along the San Jacinto fault between the San Gabriel Mountains and Mexico. This complex zone of faulting and cross faulting has two main branches, the Claremont and the Casa Loma, which form the northeast and southwest borders of the graben, respectively (see Figure 4.4).



Fault Locations

Hemet / San Jacinto Water Management Plan

October 2007

Figure 4.4

*Source: Riverside County

The Claremont fault separates the graben from the Badlands and the San Jacinto Mountains on the northeast. This fault follows Gilman Springs Road from State Highway 60 to the City of San Jacinto, hugging the foothills. It then follows the San Jacinto River before shifting to Bautista Creek south of Valle Vista. To the west, the Casa Loma fault generally parallels the Claremont Fault. The Casa Loma portion of the San Jacinto fault zone forms the southwesterly border of the graben. It runs from Park Hill (also known as Casa Loma) to the northwest toward Reche Canyon. The Bautista Creek fault is an extension of the Casa Loma fault, but is separately named due to differences in fault movement (DWR, 1969). The Bautista Creek fault runs from Bautista Canyon through the intersection of Menlo and San Jacinto Streets, joining the Casa Loma fault on the western side of Park Hill.

The portions of the Management Area outside the graben, to the east of the Claremont Fault and to the west of the Casa Loma and Bautista Creek faults, are sediment filled basins. These sediments are similar in nature to those in the graben, but are much thinner.

The faulting in the Management Area plays an important role in the movement of groundwater and is therefore a key factor in the delineation of Management Zones.

4.4 DELINEATION OF MANAGEMENT ZONES

Groundwater Management Zones (Figure 2.1) were delineated by the RWQCB based on major impermeable boundaries (such as bedrock or faults), flow systems that prevent widespread mixing even without a physical barrier, and water quality. Groundwater flow, whether or not determined by a physical barrier, was the primary characteristic used to define the Management Zones. Water quality data were used to support understanding of the flow regime and to assure that unusually high quality or poor quality waters were distinguished for regulatory purposes. (RWQCB, Resolution No. R8-2004-0001).

The four Management Zones within the Hemet/San Jacinto Management Area are:

1. Canyon;
2. San Jacinto Upper Pressure (Upper Pressure);
3. The Hemet North portion of Lakeview/Hemet North (Hemet North); and
4. Hemet South.

The Canyon Management Zone lies along a northwest to southeast axis in the eastern part of the Management Area. The boundaries of the Canyon Management Zone include the virtually impermeable San Jacinto Mountains to the east and Claremont Fault to the west. The Claremont Fault inhibits flow between Canyon and Upper Pressure Management Zones (DWR, 1969; DWR, 1978; SWRB, 1955).

Like the Canyon Management Zone, the Upper Pressure Management Zone lies along a northwest to southeast axis in the eastern part of the Management Area. The Upper Pressure Management Zone is bounded by the Claremont Fault to the northeast, the Casa Loma and Bautista Creek Faults to the southwest, and the flow system boundary with the San Jacinto Lower Pressure Management Zone to the northwest.

Boundaries of the Hemet North Management Zone include the Casa Loma Fault to the east; the groundwater divide near Esplanade Avenue to the south; the impermeable bedrock of the Lakeview Mountains to the west; and a constricted area of permeable materials between the Lakeview Mountains and the Casa Loma Fault to the northwest. The Casa Loma fault zone is a known barrier to groundwater flow (DWR, 1969; DWR, 1978; SWRB, 1955).

The Hemet South Management Zone boundaries include the Casa Loma and Bautista Creek faults to the east; the groundwater divide near Esplanade Avenue to the north; the groundwater divide in the Winchester area and various crystalline bedrock outcrops to the west. Diamond Valley Lake, a water supply reservoir for the MWD completed in 1999 and filled by 2002, is located southwest of the Hemet South Management Zone. MWD (1991) states that seepage through the permeable materials in the upper 200 feet may take place. The Casa Loma and Bautista Creek faults are known barriers to groundwater (DWR, 1969; DWR, 1978; SWRB, 1955).

For the Management Area as a whole, the mountains (Figure 4.1) form a nearly impermeable boundary such that there are only three pathways for groundwater to migrate to or from other Management Zones outside the Management Area. These locations are:

- Between the Hemet South and Perris South Management Zones, in the southwest;
- Between the Hemet North portion and Lakeview portion of Lakeview/Hemet North Management Zones, in the northwest; and
- Between the Upper Pressure and Lower Pressure Management Zones, in the northwest.

Groundwater flow in and out of the Management Area is important, as water quality is typically better in the Management Area than in the surrounding areas.

4.5 SOILS

The influence of soils on water use and hydrologic processes makes it an important component to consider when estimating changes in water use due to land use change as well as for siting spreading basins for artificial recharge projects.

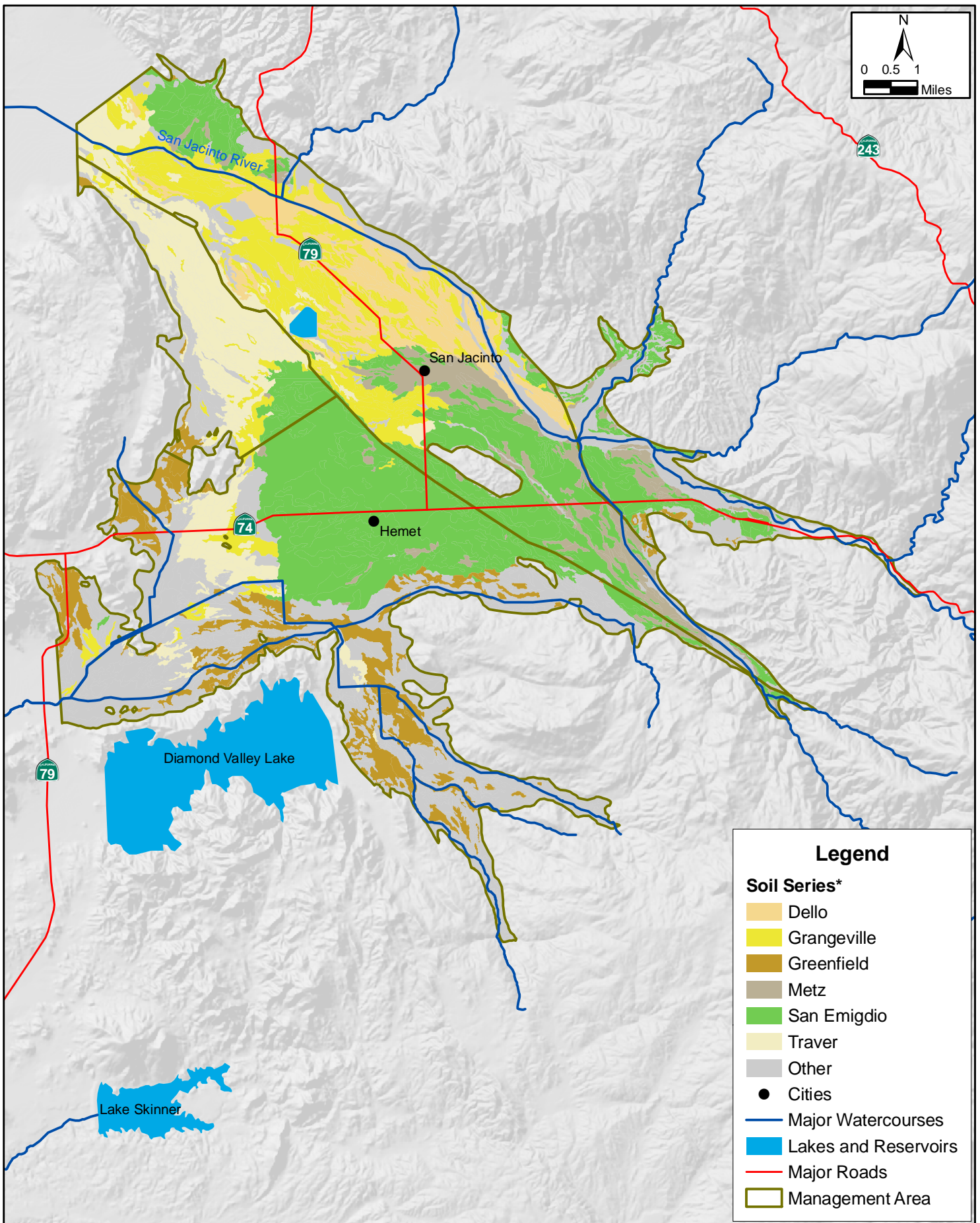
The predominant soils, as defined in the USDA's soil survey (USDA, 1971) at the series level, in the Management Area are shown in Figure 4.5 and are listed below:

- Dello,
- Grangeville,
- Greenfield,
- Metz,
- San Emigdio, and
- Traver.

The remaining soils are classified as "Other" in Figure 4.5 and consist of Chino, Domino, Exeter, Hanford, Pachappa, Ramona, Riverwash, as well as other soil series occurring in less than one square mile of the Management Area.

An important soil classification used by the USDA for hydrology is the hydrologic soils group. The hydrologic soils group can be used to estimate the amount of infiltration that can be expected from a certain soil. This grouping is based on estimates of the intake of water during the latter part of a storm of long duration, after the soil profile is wet and has an opportunity to swell, without the protective effect of any vegetation. Also considered are depths to the seasonal high water table and to a low permeability layer. The classification is useful at a planning level, but detailed studies are required for a thorough understanding of the infiltration capacity of soils. Features such as slope, ground cover, or low permeability materials away from the upper soil profile may impact the soil's capability to infiltrate water.

Under the hydrologic soils group classification system, soils are grouped A to D with "A" having the lowest runoff potential (highest infiltration rates) and "D" having the highest runoff potential (lowest infiltration rates). A map of hydrologic soils groups is provided as Figure 4.6 (USDA-SCS, 1971) and a corresponding table of hydrologic soil groups and soil series is provided in Table 4.2. As can be seen on Figure 4.6, most of the Management Area is classified as "B", soils with a moderate infiltration rate. Of the Management area, nearly 80% are "B" soils, 10% are "A" soils, and the remainder are either "C", "D", or are deemed too variable to be classified. The "A" soils are generally located along the San Jacinto River and Bautista Creek; much of the "variable" soils along these watercourses also have the potential for very high infiltration rates.



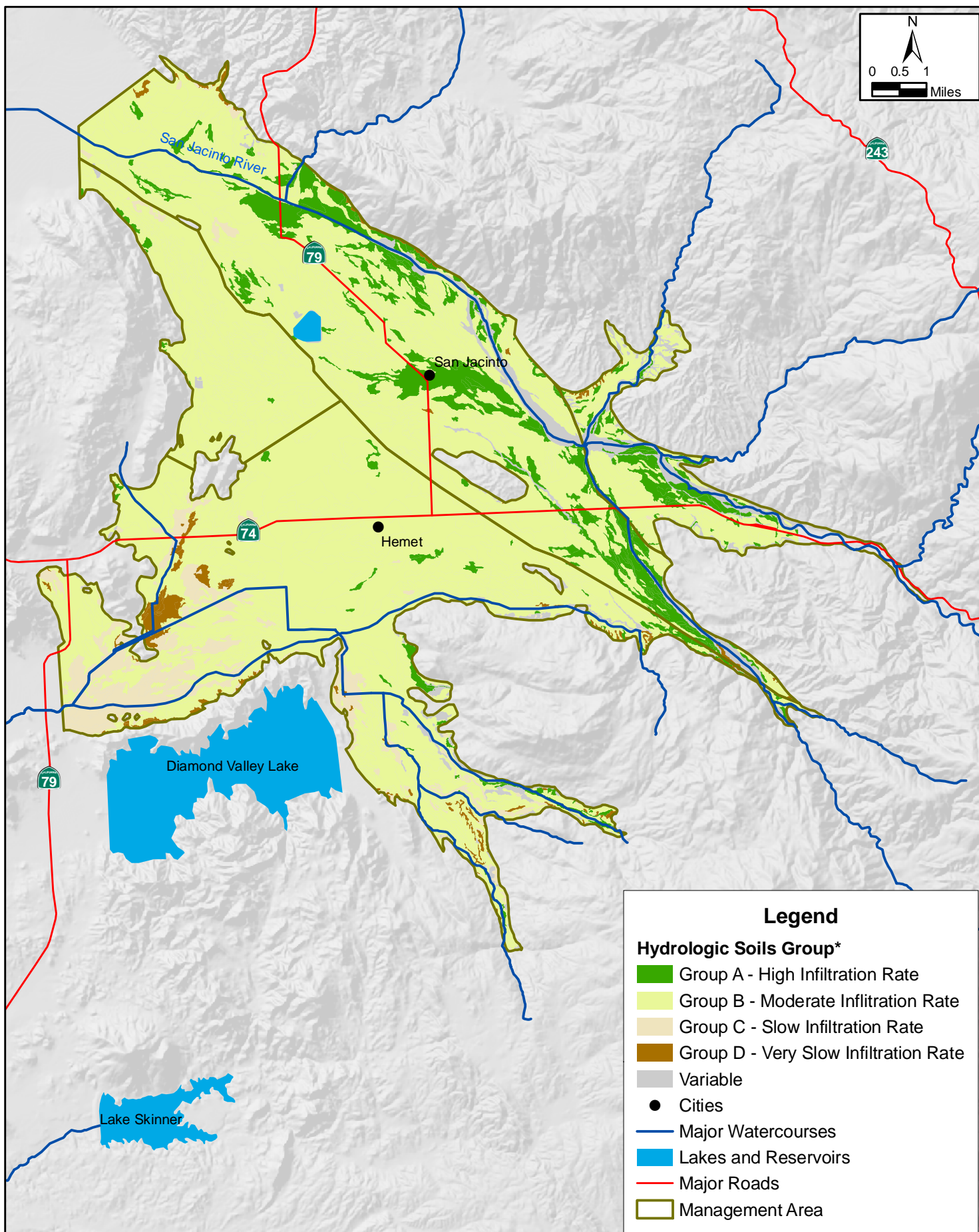


Table 4.2 Hydrologic Soils Groups

Common Soil Series	Hydrologic Soils Group	Minor Soil Series	Hydrologic Soils Group
Dello	A-C	Chino	B-C
Grangeville	B-C	Domino	C
Greenfield	B	Exeter	C
Metz	A	Hanford	B
San Emigdio	B	Pachappa	B
Traver	B-C	Ramona	B-C
		Riverwash	variable
		Other	variable

4.6 GROUNDWATER CONDITIONS

As previously stated, groundwater flow between Management Zones is inhibited by geologic faults, (Figure 4.4) notably the Casa Loma Fault, Bautista Creek Fault and Claremont Fault, all strands of the San Jacinto fault zone. The Claremont Fault acts as a barrier to flow between Canyon and Upper Pressure Management Zones, while the Casa Loma Fault is a barrier to flow between the Upper Pressure Management Zone and both the Hemet North and Hemet South Management Zones.

The San Jacinto River enters the basin in the southeast part of the Management Area and flows north and west across the Upper Pressure Management Zone. In most years, all river flow is lost to percolation and limited evapotranspiration in the Canyon and Upper Pressure Management Zones. Recharge from the San Jacinto River and its tributaries forms a large portion of total inflow for the Canyon and Upper Pressure Management Zones.

Groundwater pumping for irrigation and domestic purposes is the principal source of groundwater outflow. Major pumping depressions occur in the Hemet South and Upper Pressure Management Zones.

Historically, extraction in excess of recharge has resulted in lowered groundwater levels and altered directions of groundwater flow.

4.6.1 ARTIFICIAL RECHARGE OPERATIONS

In addition to natural inflows and return flows from agricultural and municipal uses, there has been and continues to be artificial recharge operations in the Management Area. These

operations use imported water, when available, typically at lower winter rates, to artificially recharge groundwater through spreading basins. The annual volume of imported water recharged is presented in Figure 4.7. Recharge operations did not begin until 1990. More recently, the Public Agencies have signed memoranda of understanding in 2004 and 2005 to plan for the recharge at two existing recharge facilities in the San Jacinto riverbed.

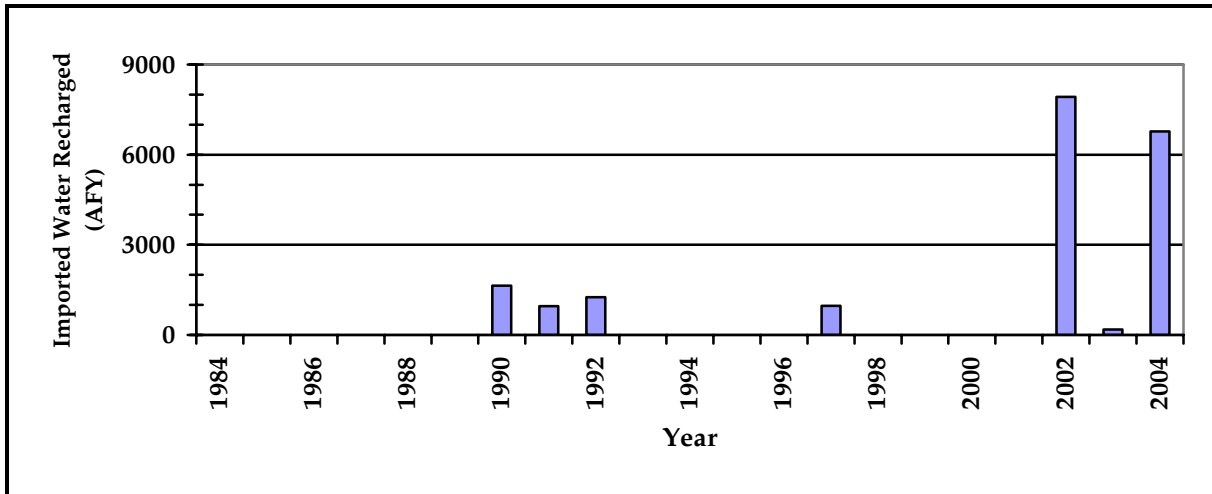
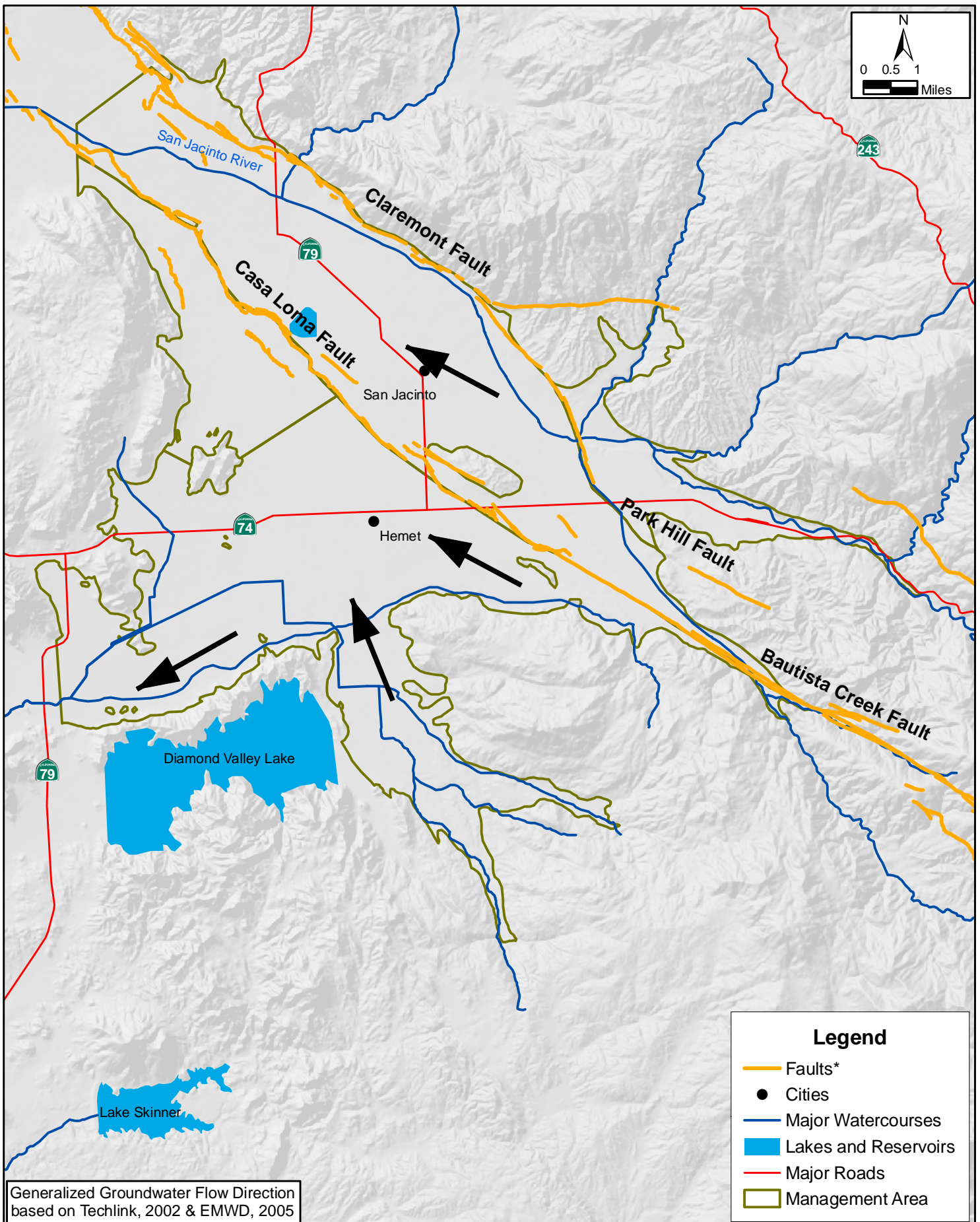


Figure 4.7 Annual Imported Water Recharged

The artificial recharge operations help address the impact of overdraft caused by past groundwater production.

4.6.2 GROUNDWATER LEVELS AND FLOW

Historical groundwater extraction from the Management Area has resulted in a significant drop in groundwater levels. The lowered groundwater levels also changed the direction of flow in parts of the Management Area. Figure 4.8 shows the flow directions in the early 20th Century. Figure 4.9 shows current flow directions. Notable changes over time include the development of a groundwater divide between the Hemet South and Perris South Management Zones (previously flow was out of the Hemet South Management Zone into the Perris South Management Zone and flow from the Hemet North portion to the Lakeview portion of the Lakeview/Hemet North Management Zone due to lower water levels in the Lakeview portion. (TechLink, 2002a)



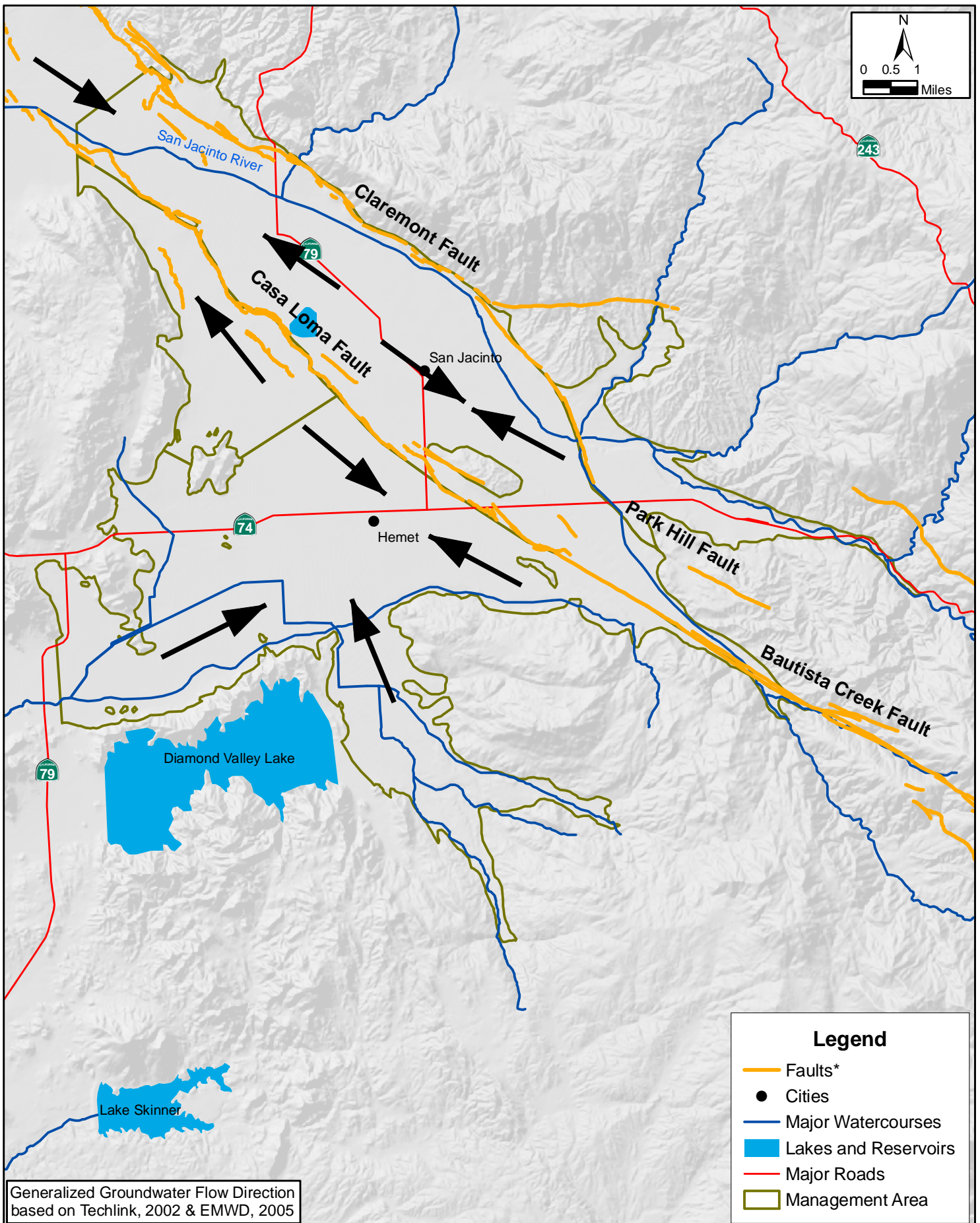


Figure 4.10 shows Spring 2004 groundwater levels. The groundwater level contours show pumping depressions in the northeastern part of the Hemet South Management Zone and in the northwestern part of the Upper Pressure Management Zone. These pumping depressions are due to concentrated pumping in those areas in excess of the local recharge capacity.

Historical groundwater levels are affected by both climatic conditions, which impact the amount of recharge, and pumping. Historical conditions in the four Management Zones can be studied in relation to their unique setting by analyzing observed water levels at representative wells with long periods of record. Hydrographs for four selected wells are presented in the following sections. The locations of the wells can be found on Figure 4.11.

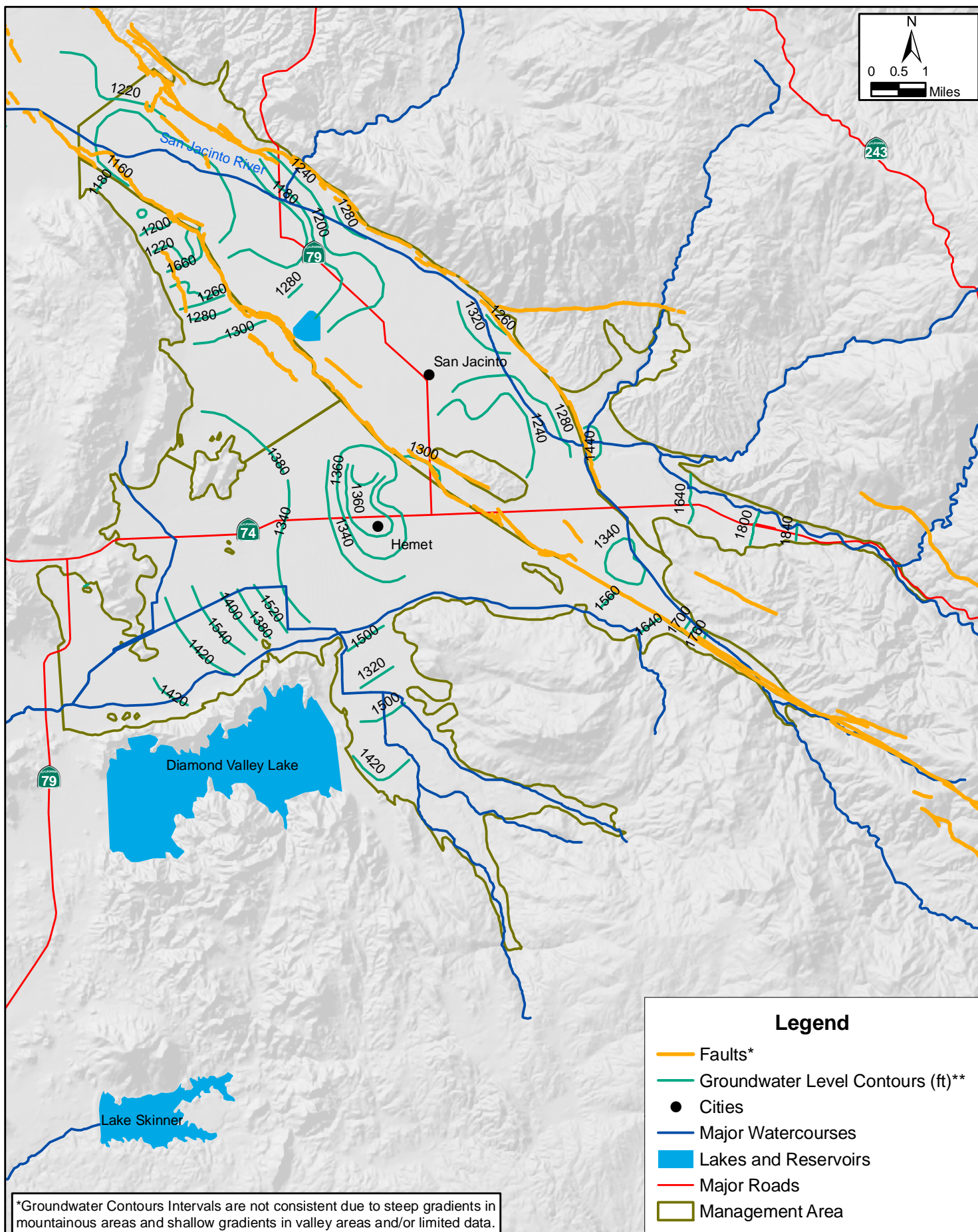
4.6.2.1 Canyon Management Zone

The Canyon Management Zone benefits from significant surface water recharge from the San Jacinto River and its tributaries. This additional recharge reduces the impact of the pumping occurring in the Canyon Management Zone. Figure 4.12 shows groundwater levels from 1948 to 2005 for EMWD's #6 Cienega well. This figure shows the impact of hydrologic variability and pumping in the area. One drought period in the late 1980s resulted in groundwater levels dropping by over 100 feet. Such declines in groundwater levels are likely due to a combination of reduced precipitation, reduced recharge from streamflow, and the effects of pumping. Most of this decline was recovered in the wet period that followed from 1991 to 1993.

Changes are also seen seasonally, with groundwater levels changing by as much as 100 feet from late fall to late spring. These seasonal changes in water levels are also due to a combination of reduced precipitation, reduced recharge from streamflow, and the effects of pumping.

4.6.2.2 Upper Pressure Management Zone

The Upper Pressure Management Zone benefits from surface water recharge from the San Jacinto River and its tributaries and supplies most of the groundwater for the Management Area. However, even with significant recharge from surface water as well as other inflows, wells in the Upper Pressure Management Zone have shown a decline in water levels over time. Figure 4.13 presents water level elevations for EMWD's #9 Hewitt and Evans well, showing a consistent decline through the dry period of the 1950s, 1960s, and 1970s with a drop of more than 200 feet over the 30-year period. The hydrologically wet and normal periods during 1978 to 1986 resulted in a recovery of about half the decline from the previous three decades. Since 1986, groundwater levels have dropped approximately 200 feet. The changes seen in the well



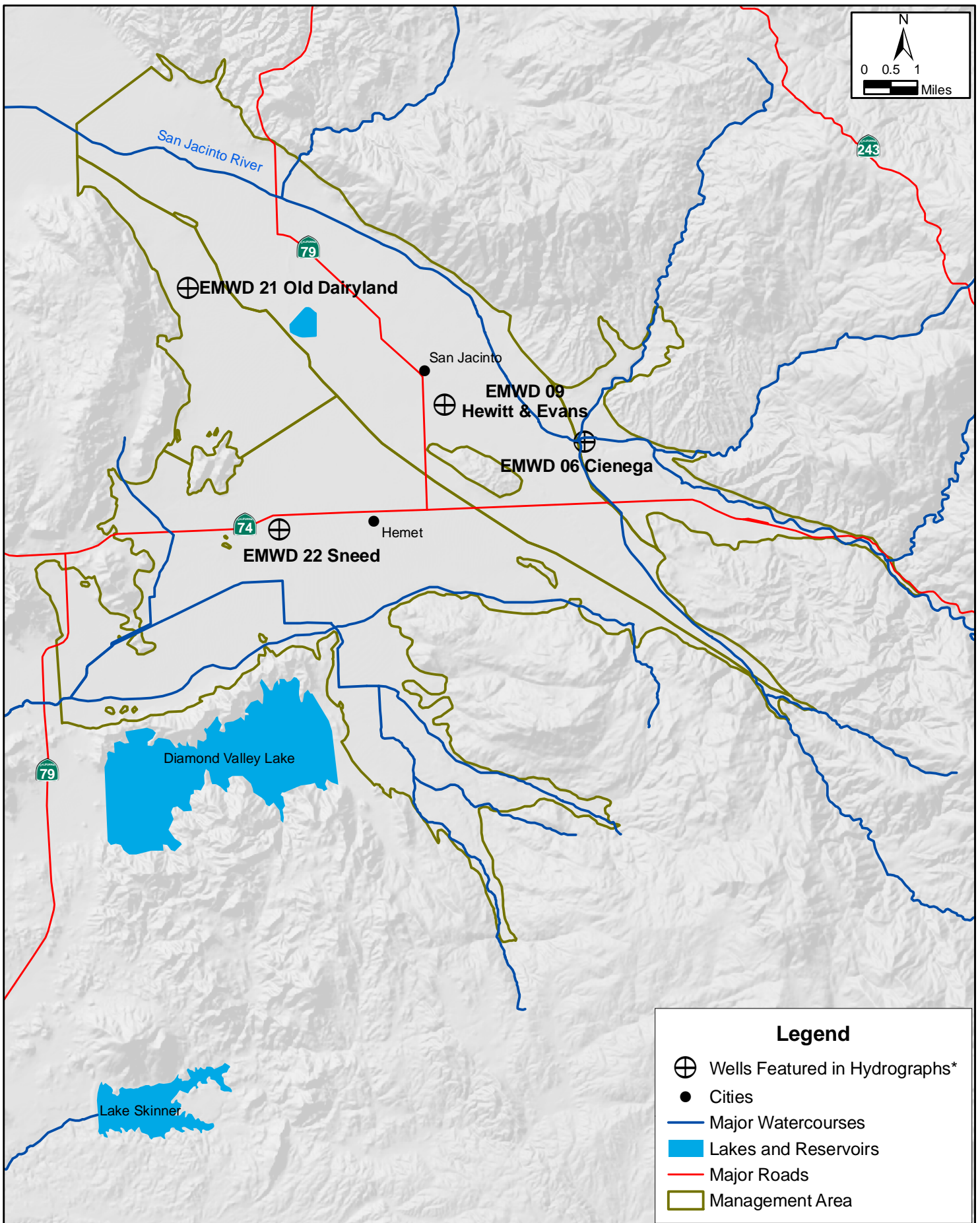


Figure 4.12 Groundwater Elevation
Canyon Management Zone, EMWD #6 Cienega

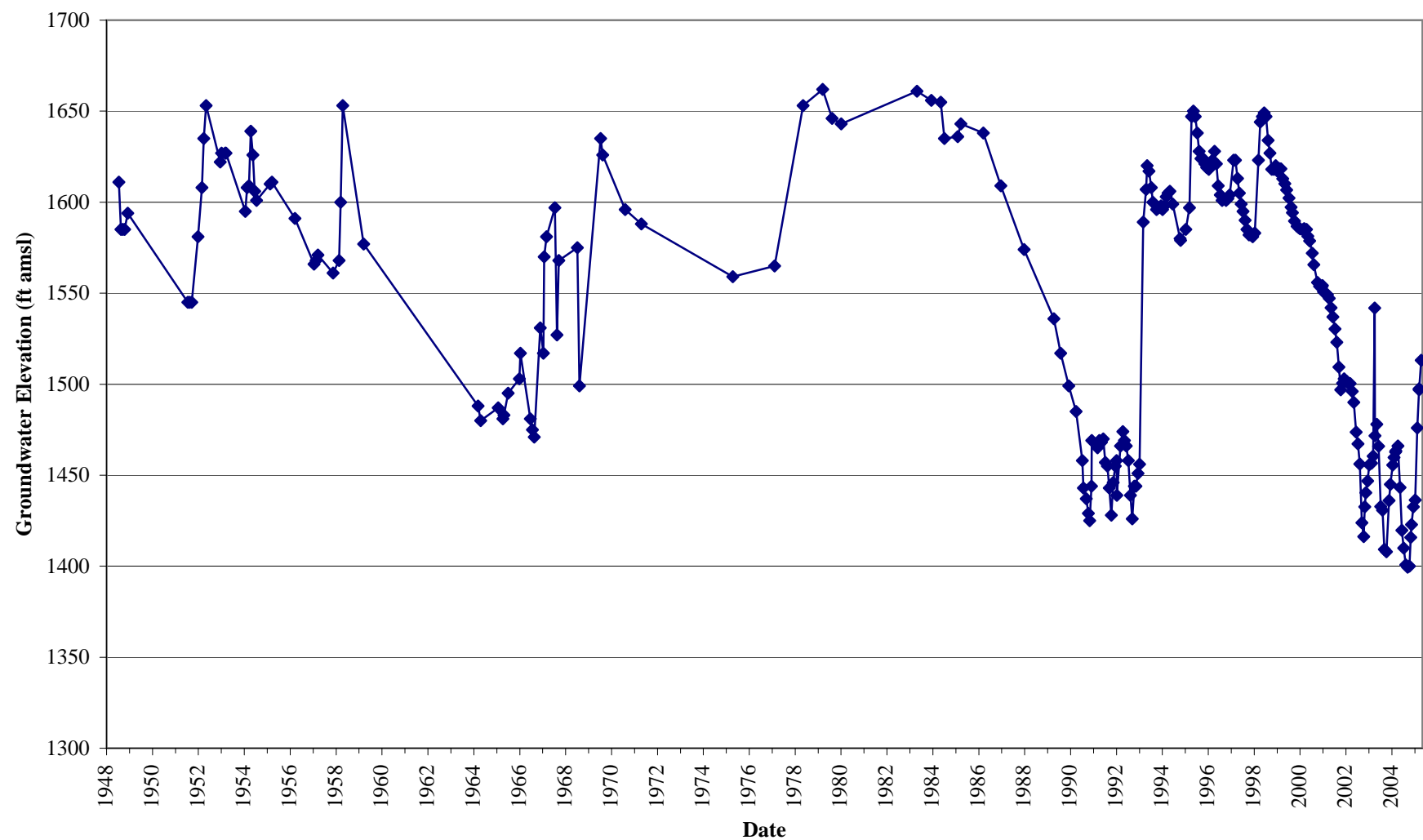
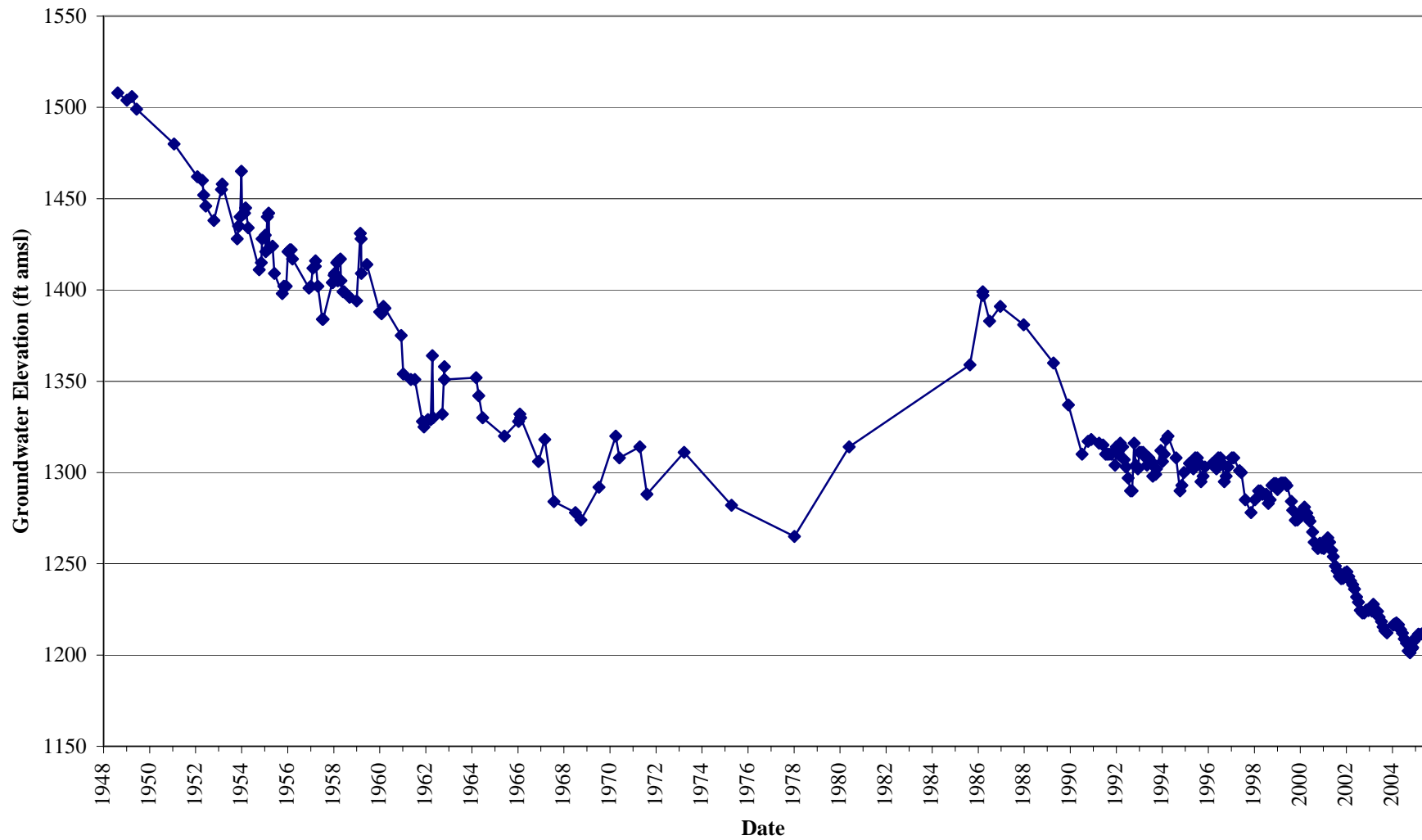


Figure 4.13 Groundwater Elevation
Upper Pressure Management Zone, EMWD #9 Hewitt and Evans



are likely due to a combination of reduced precipitation, reduced recharge from streamflow, and effects of pumping.

4.6.2.3 Hemet North Portion of the Lakeview/Hemet North Management Zone

Groundwater levels in Hemet North portion of the Lakeview/Hemet North Management Zone have shown a steady decline followed by recent stabilization. These declines occur even though significantly less water was pumped from the Hemet North portion than from other Management Zones. The Hemet North portion does not receive as much surface water recharge as Upper Pressure and Canyon Management Zones, thus impacts of pumping are more pronounced than they might be in those Management Zones. Figure 4.14 shows groundwater levels at EMWD's #21 Old Dairyland well. Since the beginning of the record in 1966, groundwater levels have steadily declined, with little variability. After dropping more than 100 feet from the mid-1960s to the mid-1990s, groundwater levels have stabilized at an average of 1,250 feet above mean sea level.

4.6.2.4 Hemet South Management Zone

Groundwater levels in the Hemet South Management Zone have shown a steady decline, although the recent rate of decline has slowed. Figure 4.15 shows groundwater levels at EMWD's #22 Sneed well since the beginning of the record in 1952. While data is limited for the 1952 to 1990 period, groundwater levels declined through the 1952-1990 period, and the increased data available from 1990 to 2005 shows little variability. Groundwater level declines have slowed but have still dropped approximately 20 feet in the past 10 years.

4.6.3 GROUNDWATER BUDGET

The changes in groundwater levels and flow directions are the result of changes in the balance of inflows and outflows from the Management Area. A groundwater budget can identify potential causes of an imbalance. The groundwater budget presented in Table 4.3 shows average annual values for the components of total inflow and total outflow. The values are based on a water balance spreadsheet tool developed for use by the TC. This Excel-based tool allowed the TC members to investigate the impact of inclusion and exclusion of specific water budget components, such as artificial recharge, imported water, and others, as well as the implications of different data sources, such as the calibrated groundwater model and the database or reported values with underflow estimates. This allowed for a more thorough understanding of the potential impacts of definitions of water budget components on the calculated yield and overdraft. The values presented in Table 4.3, as agreed upon by the TC, are the results of the calibrated groundwater model except for groundwater extraction, which is

Figure 4.14 Groundwater Elevation
Hemet North Management Zone, EMWD #21 Old Dairyland

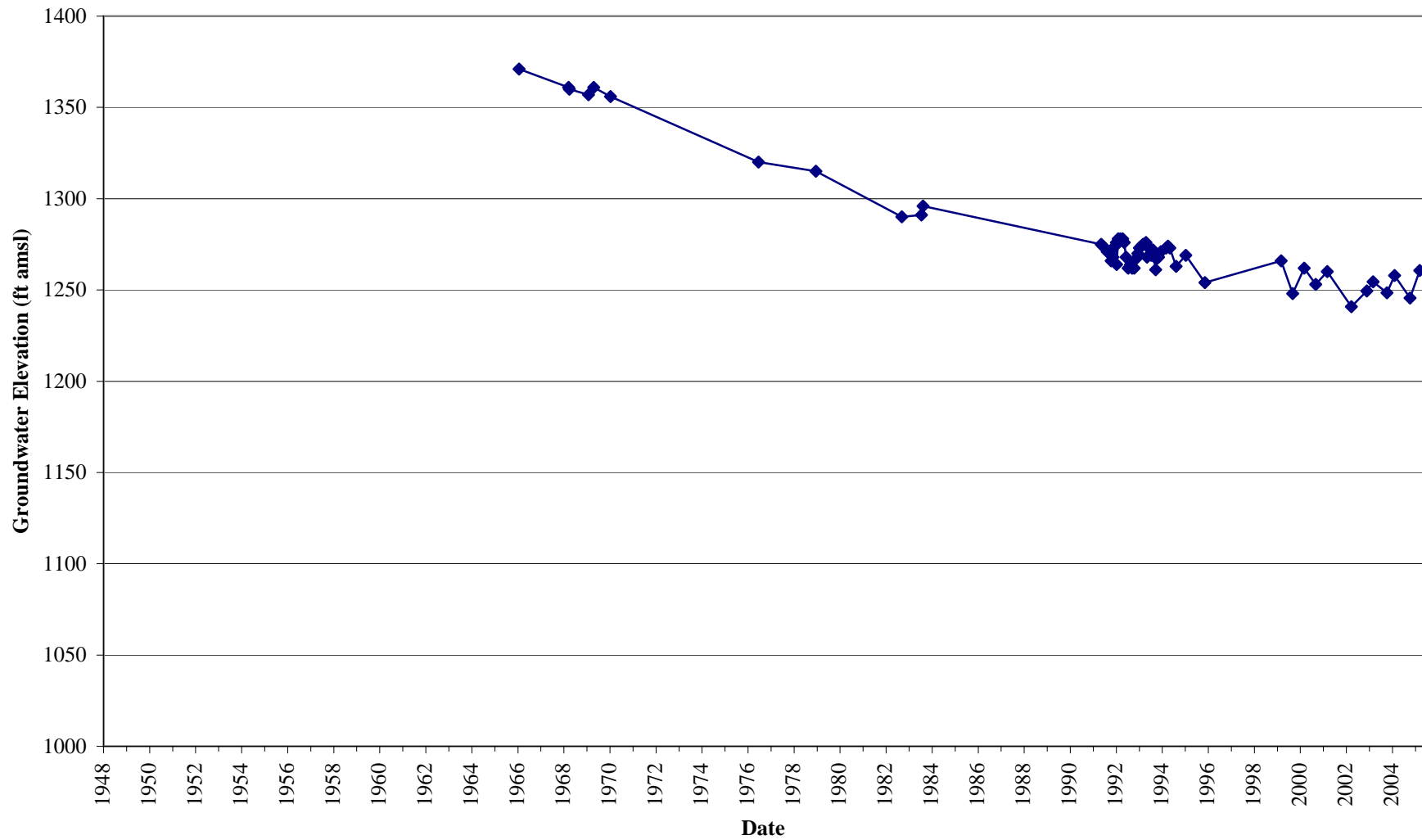
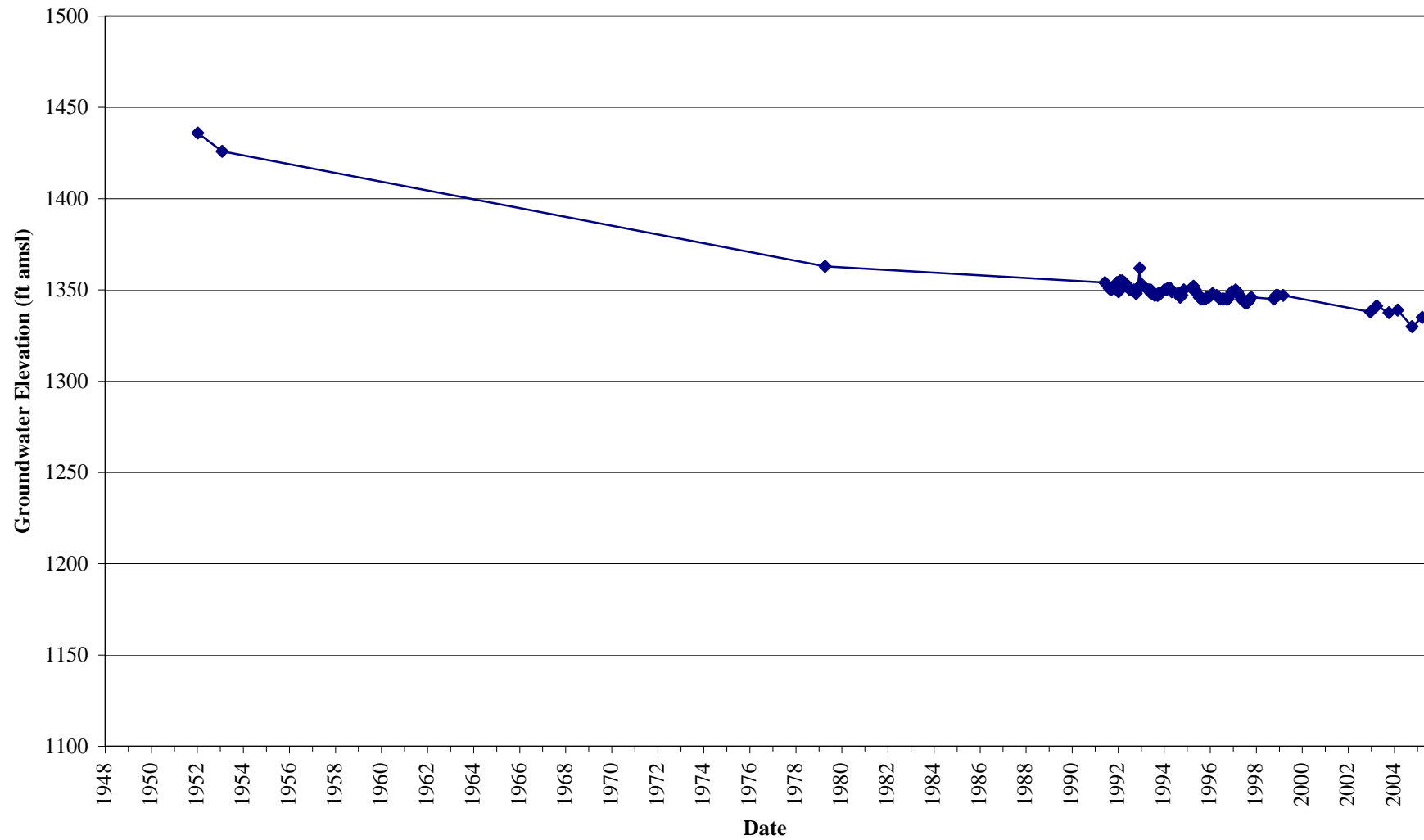


Figure 4.15 Groundwater Elevation
Hemet South Management Zone, EMWD #22 Sneed



obtained from the data tabulated in *Assessment of Historical and Projected Land and Water Use Data* (WRIME, 2003a).

Table 4.3 Groundwater Budget for the Management Area
(Average Annual Volume for Water Years 1984-2004*)

Inflow Component	Volume (AFY)	Outflow Component	Volume (AFY)
Recharge from Rainfall	8,900	Groundwater Production	57,800
San Jacinto River and Bautista Creek Recharge	9,900	Subsurface Outflow from Hemet South to Perris South	300
Recharge from Public Agency Sales	2,900	Subsurface Outflow from Hemet North to Lakeview	1,500
Recharge from Irrigation	9,600		
Conjunctive Use Recharge	800		
Reclaimed Water Recharge	1,500		
Subsurface Inflow from Mountain Fronts	8,000		
Subsurface Inflow from Lower Pressure to Upper Pressure	1,700		
Total	43,300	Total	59,600

* Values for Groundwater Production represent 1984-2004 averages, an update from the 1984-2003 values presented in WRIME, 2003a. All other data is taken from the 1984-1999 modeling results (TechLink, 2002a).

The total average annual inflow is 43,300 AFY and the total average annual outflow is 59,600 AFY, resulting in an average annual deficit of 16,300 AFY for the 20-year hydrologic period of 1984 to 2004. Nearly all (97%) outflow is from groundwater extraction while inflow is primarily natural recharge, representing 66% of inflow and the remainder a direct result of recharge from applied water or other human activities. The 1984-2004 hydrologic period presented in Table 4.3 represents the period during which the most consistent and continuous data for the Management Area is available. It should be noted, however, that this period does not necessarily represent the long-term groundwater basin conditions, and as described in Section 4.9 of this document, long-term overdraft is estimated based on longer periods, as well as other methods and criteria.

4.6.4 LAND SUBSIDENCE

In addition to water quantity and quality concerns, there is the potential for further land subsidence in the Management Area, although not at rates to cause significant damage.

Widespread land subsidence has been observed in the San Jacinto basin as the area and its groundwater resources have been developed. Three forms of subsidence have been reported by the U.S. Environmental Protection Agency (Boen, et al., 1971): local or regional tectonic adjustments along the faults in the area; groundwater withdrawals and subsequent artesian head decline; and soil collapse or compaction due to causes other than tectonic or artesian head decline. In the graben, tectonic subsidence has averaged 0.2 in/yr (4.5 mm/year) over the past 40,000 years and subsidence due to groundwater withdrawal and aquifer compaction is 1 - 1.2 in/yr (2.5 - 3 cm/yr) (Morton, 1995). Lofgren (1975, 1976) reported in studies that, through the years, the periods of subsidence tend to correspond to the periods of groundwater production; land surface elevation at the well tends to be lower each year; and subsidence has been greater within the graben than on either side.

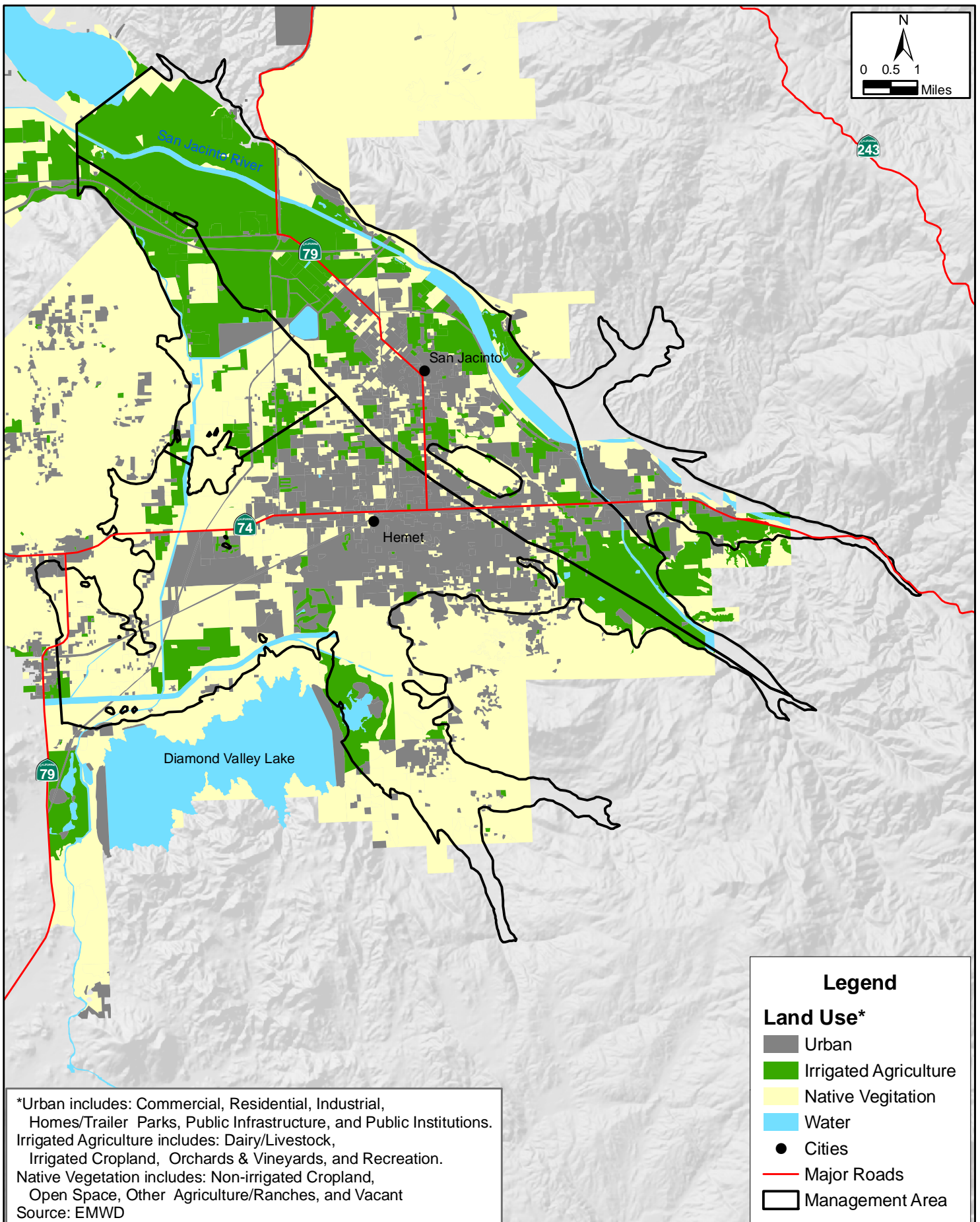
4.7 LAND USE

Land use in the Management Area has experienced changes over the past half-century. The conversion from agricultural or undeveloped lands to urban uses has an impact on basin hydrogeology as well as on water demand. Figure 4.16 and Table 4.4 show land uses in 1998 for most of the project area.

Table 4.4 Land Use Distribution Based on the 1998 Survey

Land Use	Canyon	Upper Pressure	Hemet South	Hemet North	Total
Total Area (acres)	4,400	21,200	25,300	5,600	56,500
% Urban and Suburban	24%	24%	36%	11%	28%
% Irrigated Crops and Recreational	12%	49%	15%	47%	31%
% Non-Irrigated Crops and Native Vegetation	16%	24%	45%	42%	35%
% Unmapped	48%	3%	4%	0%	7%

Much of the urban uses in the area are recent. This is shown by the significant population growth in the area, as highlighted Figure 4.17, which displays population data from the decennial US Census reports and a 2004 US Census estimate for the incorporated areas of Hemet and San Jacinto.



1998 Land Use

Hemet / San Jacinto Water Management Plan

October 2007

Figure 4.16

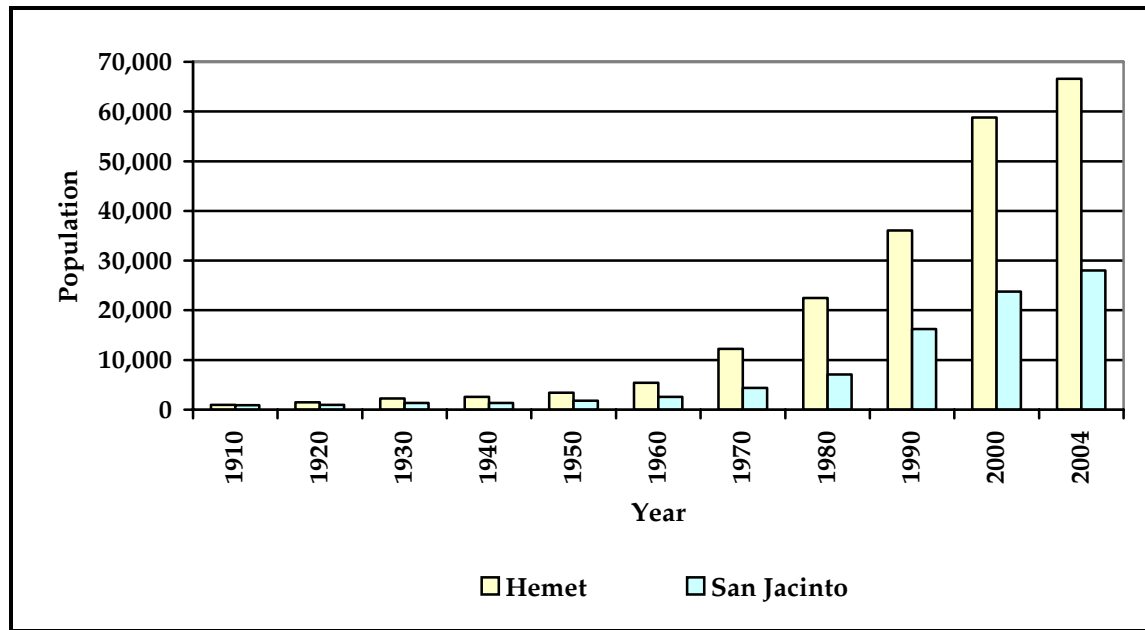


Figure 4.17 Population Growth in Incorporated Hemet and San Jacinto

From 1950 to 2004, the population in Hemet increased twenty-fold and the population in San Jacinto increased sixteen-fold. Such urbanization results in changes in both water demand and hydrologic processes. For newly urbanized areas that were previously non-irrigated, water demands obviously increase significantly. Areas that change from irrigated agricultural uses to urban uses do not typically see major changes in the total annual water demand. However, water demand from urban users is typically less elastic than water demand from agricultural users, making drought contingencies more important. The requirements for water quality are also typically more stringent for urban users. From a hydrologic perspective, urbanization results in an increase in the impervious land area, e.g., more pavement and buildings, with the resulting increased runoff and decreased infiltration. Additionally, the water used indoors by urban users is sent to treatment plants, shifting the potential for recharge of this water from the area of use to the treatment plant area.

The urbanization trend is not unique to the Management Area, but has been pervasive throughout the fringes of urbanized Southern California. While the rate of urbanization may change in the future, the trend of urbanization is likely to continue and to play a significant role in land use and water demand. Further discussion of future land use changes may be found in Section 5.

4.8 CURRENT WATER SUPPLIES

There are four Public Agencies primarily responsible for water supply in the Management Area: EMWD, LHMWD, and Cities of Hemet and San Jacinto. In addition, Private Water Producers produce groundwater and purchase water from the Public Agencies, and the Soboba Tribe pumps groundwater for its respective uses. Each entity pumps groundwater, and some entities also utilize a mix of some of the following sources: surface water diversions, surface water and/or groundwater purchases, surface water imports, and recycled water. The water supply conditions in the Management Area and the interrelationships among the various agencies is a primary factor for future water management in the area. Figure 4.18 shows these interrelationships in a diagram form.

Figure 4.19 shows the makeup of the water supply and how this mix has changed from 1985 to 2004 for the Management Area. Groundwater is the predominant source of water supplies for the Management Area. The remaining sources are smaller, but still important, sources of water. Supplies listed by entity are provided in Appendix F. Note that items such as sales to other agencies are not subtracted in these supply values, resulting in a supply that represents both wholesale and retail supplies. As a result of this definition, supplies will not equal the historical demand. Historical demand for the individual entities is shown in Figures 4.20 – 4.25.

4.8.1 GROUNDWATER

All entities pump groundwater for all or a portion of their water supply. The quantity of groundwater extraction for each Management Zone is shown in Figures 4.26a, 26b, and 4.27.

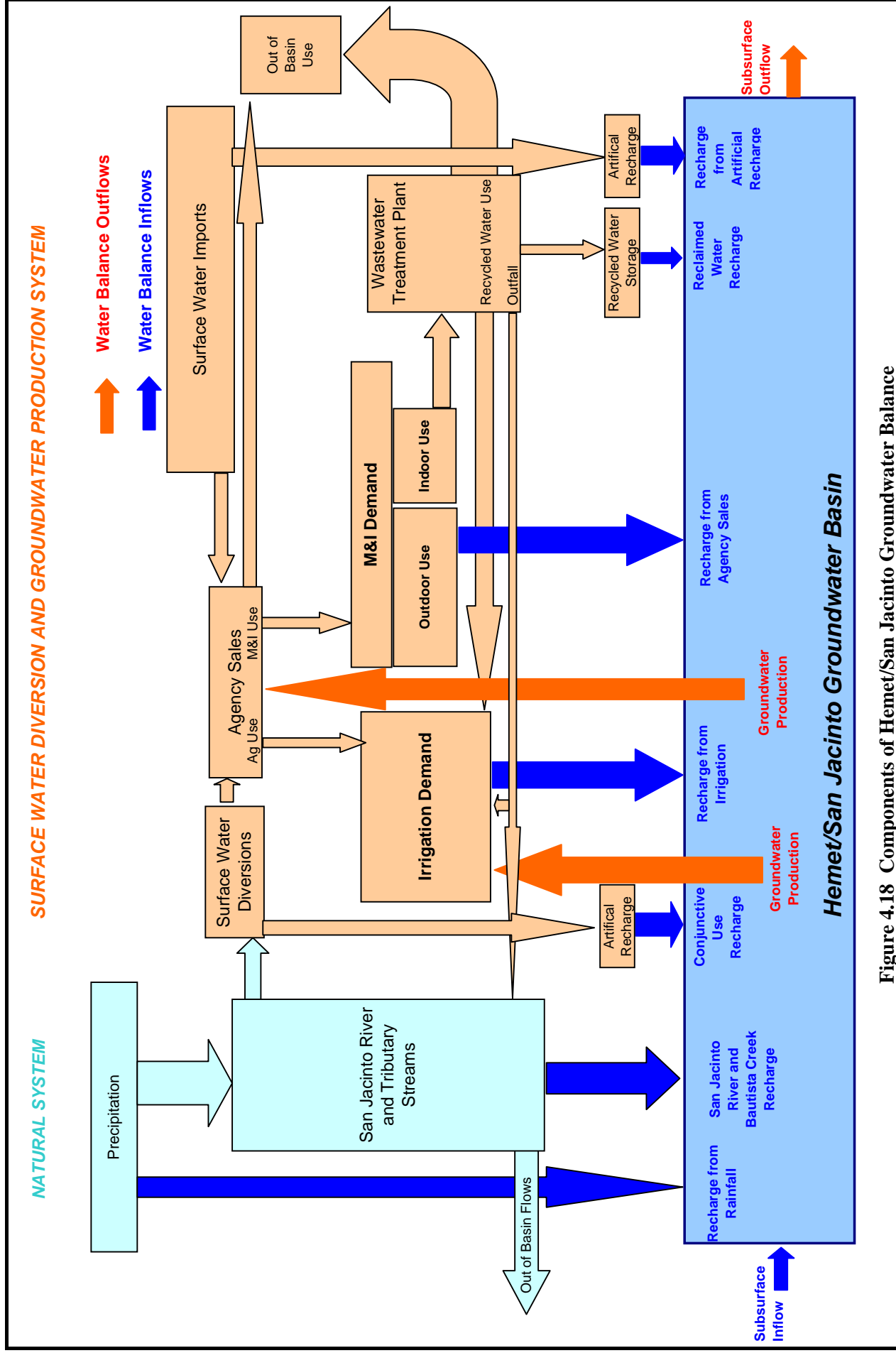


Figure 4.18 Components of Hemet/San Jacinto Groundwater Balance

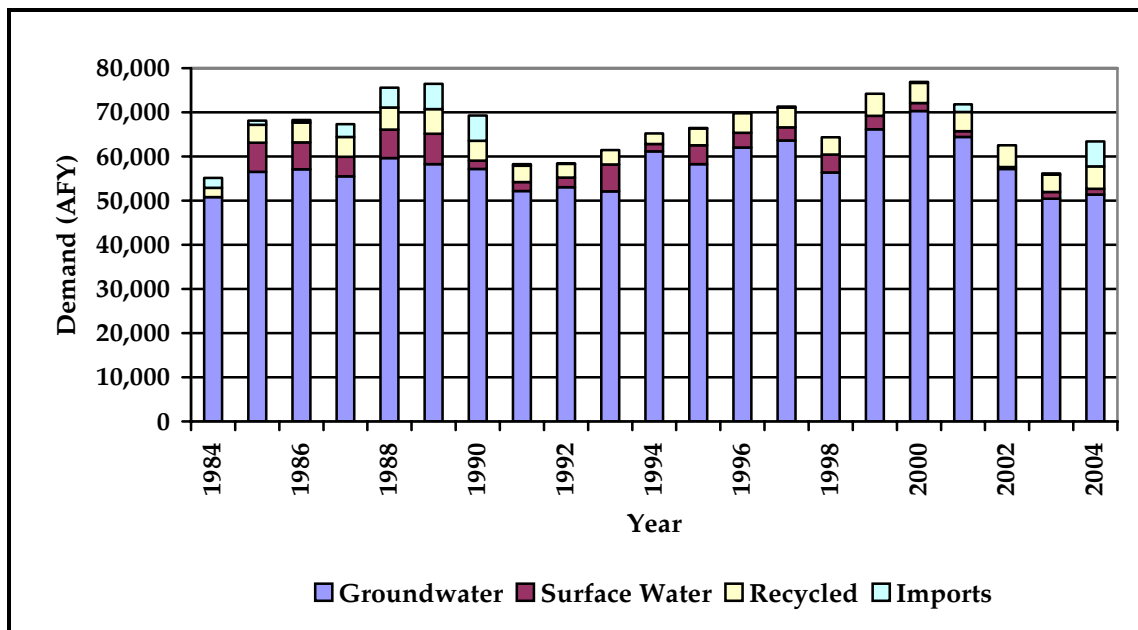


Figure 4.19 Annual Management Area Water Supplies

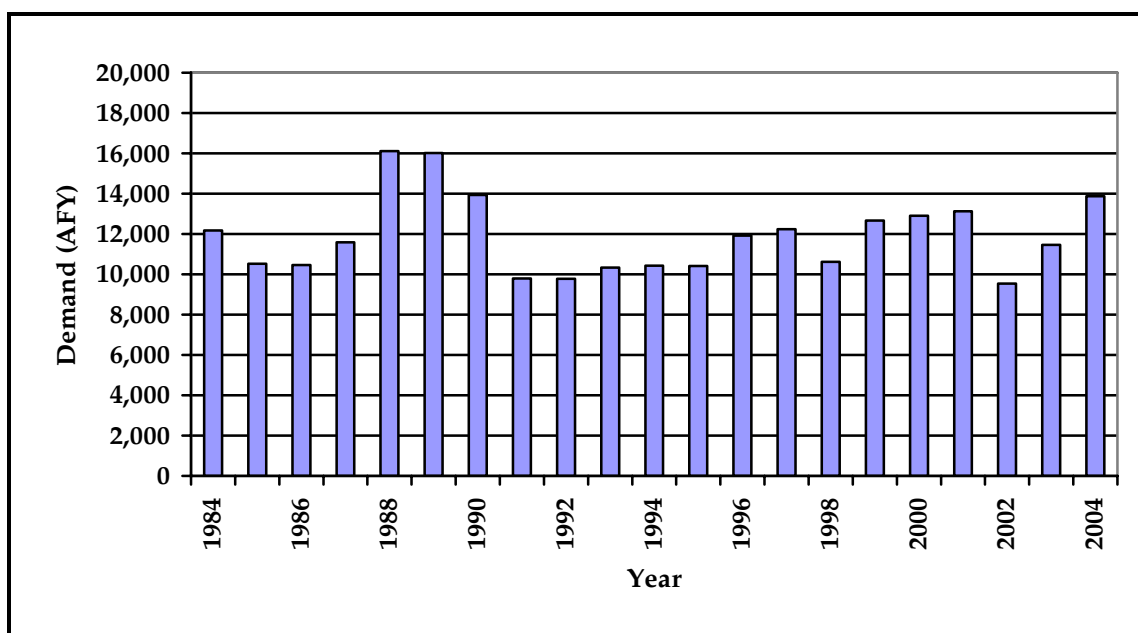


Figure 4.20 EMWD Historical Annual Demand

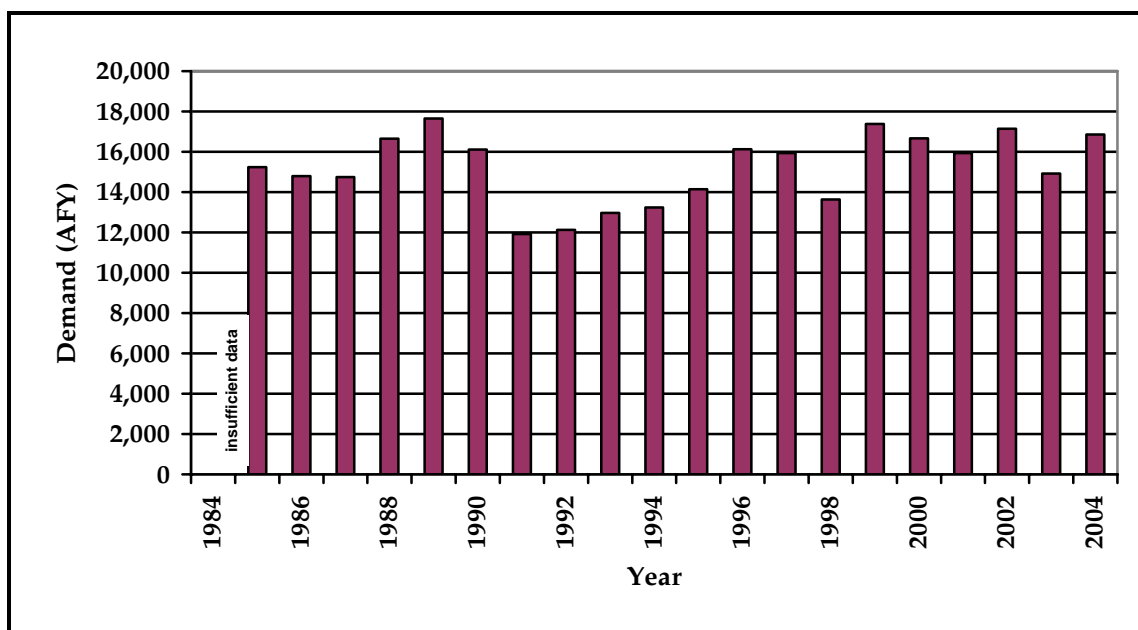


Figure 4.21 LHMWD Historical Annual Demand

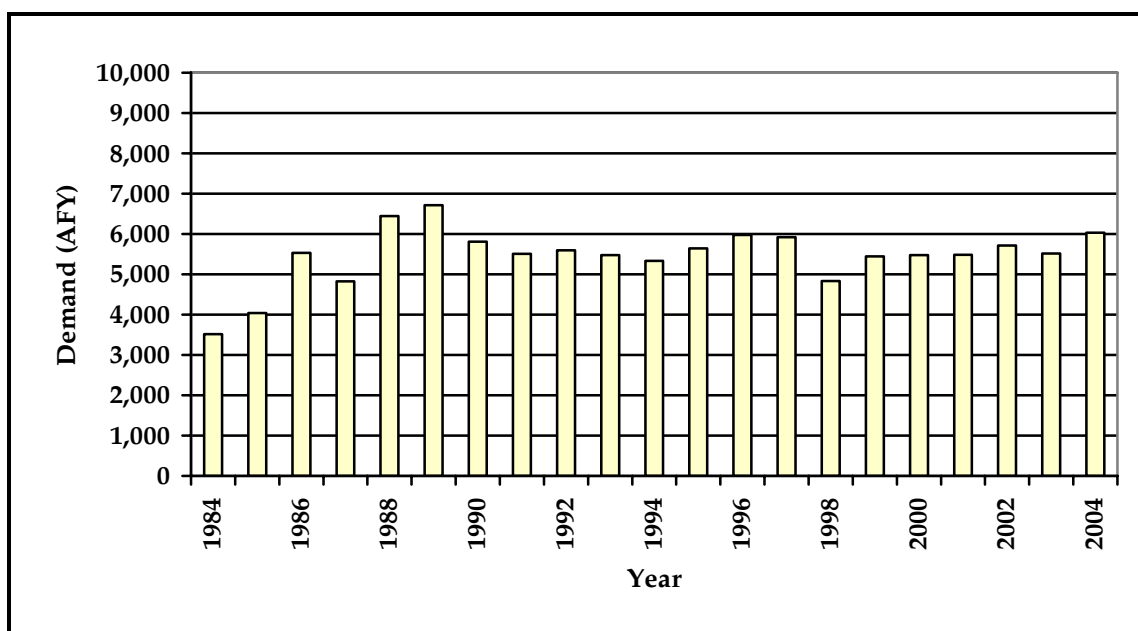


Figure 4.22 City of Hemet Water Service Area Historical Annual Demand

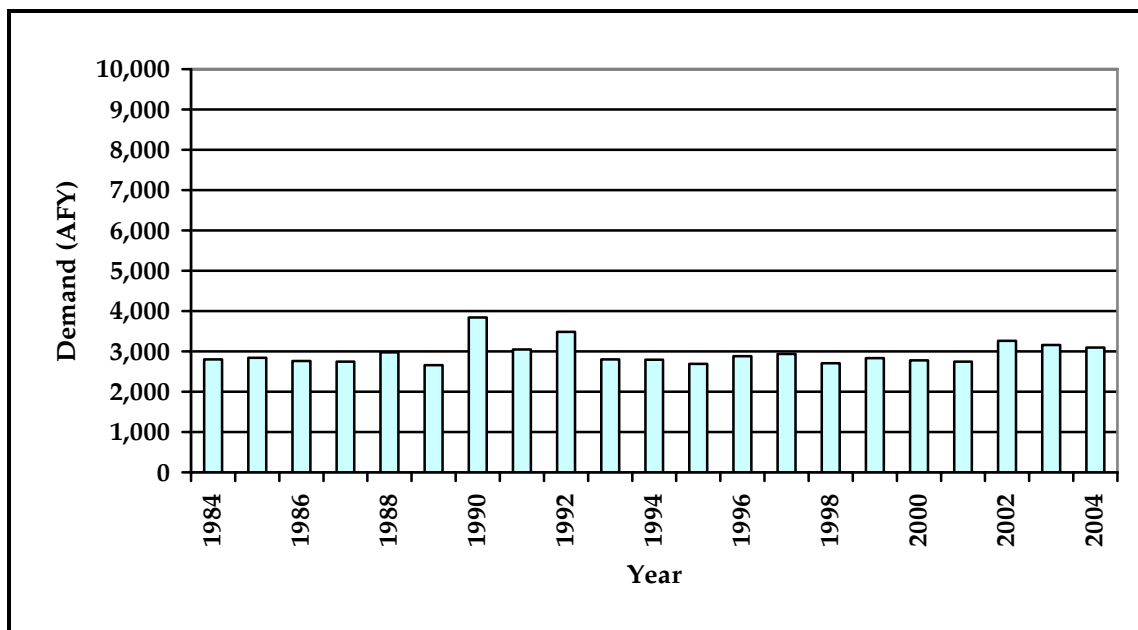


Figure 4.23 City of San Jacinto Water Service Area Historical Annual Demand

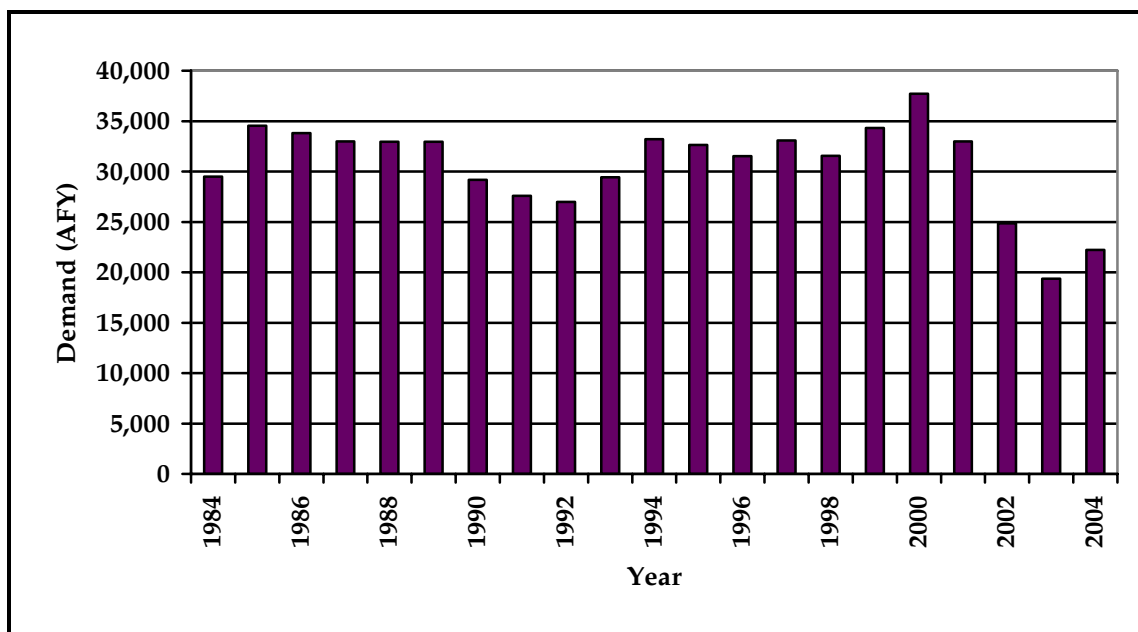


Figure 4.24 Private Water Producers Historical Annual Demand

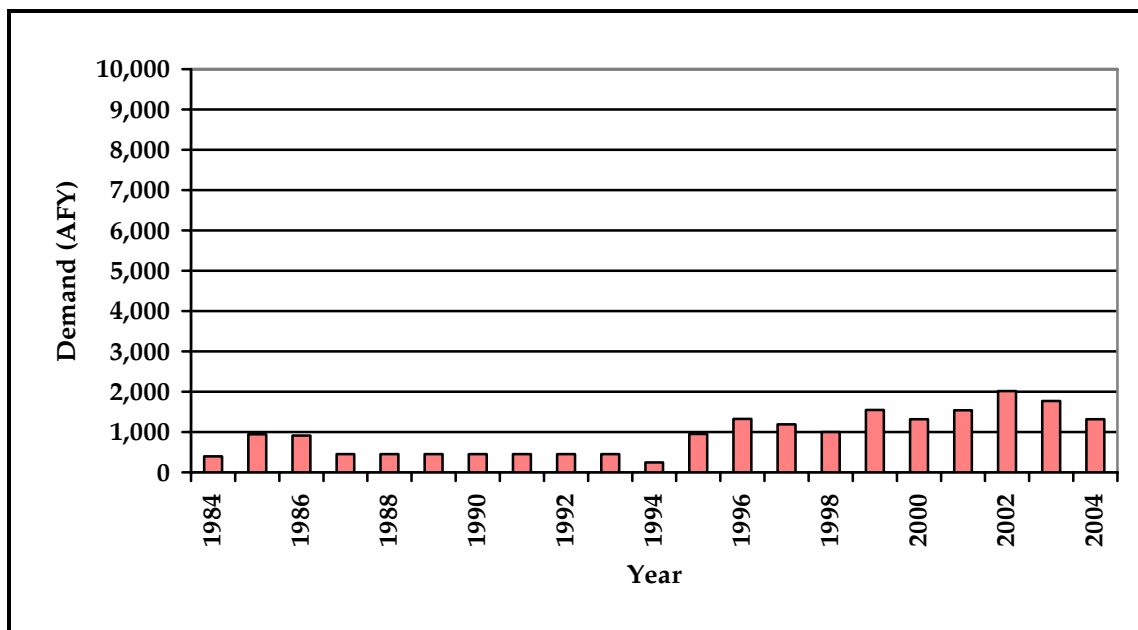


Figure 4.25 Soboba Historical Annual Demand

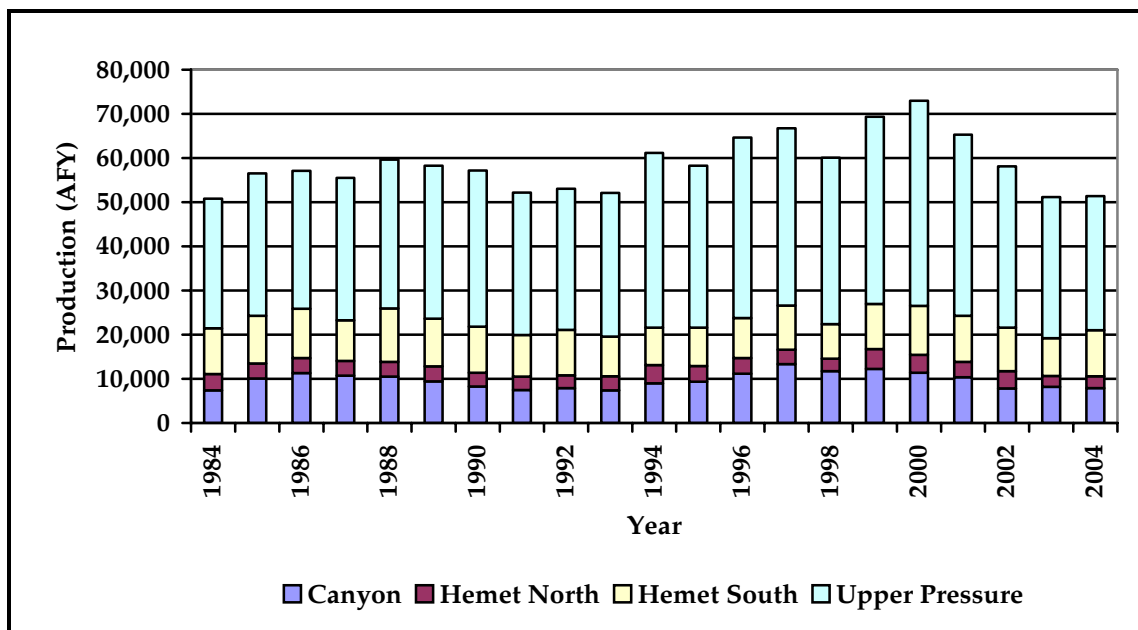


Figure 4.26a Annual Groundwater Production, by Management Zone

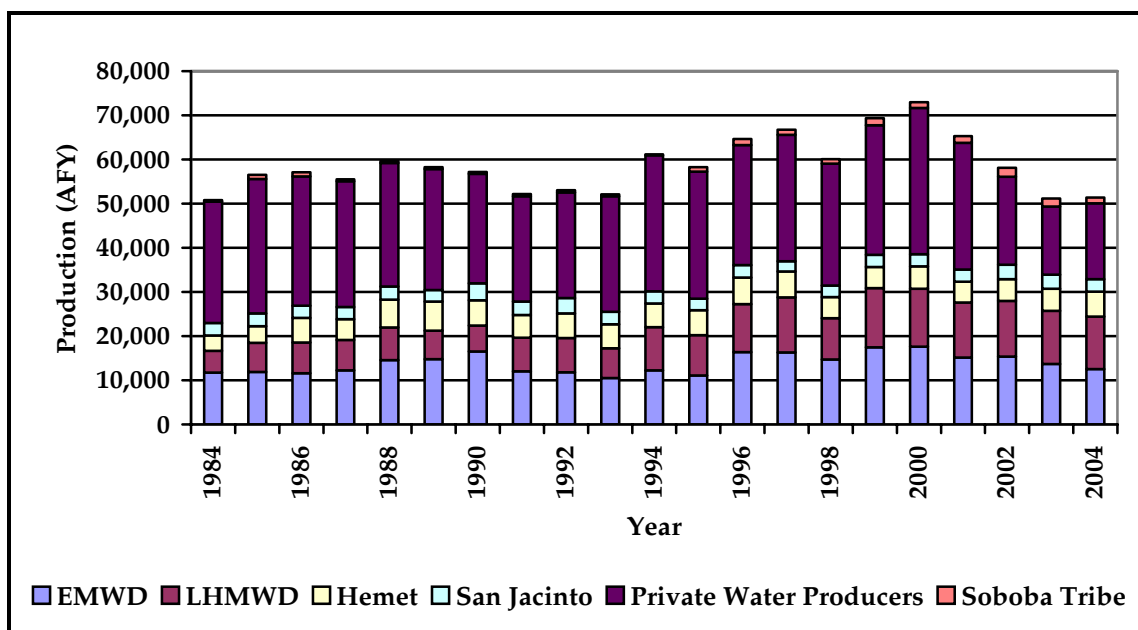


Figure 4.26b Annual Groundwater Production, by Entity

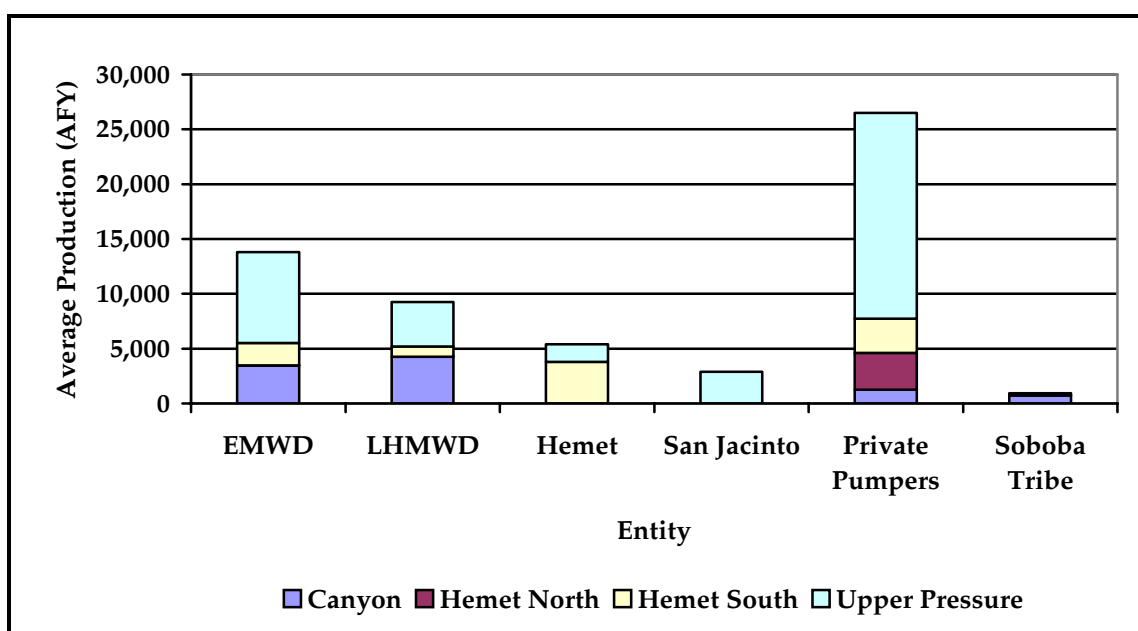


Figure 4.27 Average Annual Entity Groundwater Production, by Management Zone, 1984-2004

Since 1984, each entity except for the City of San Jacinto has pumped groundwater from multiple Management Zones. San Jacinto's pumping during that time period has always been from the Upper Pressure Management Zones. The percentage of the water supply from groundwater for each remaining entity, compared to other components of the water supply, is shown in Figures 4.28a-e as a pie chart breaking down the entity's 2004 groundwater supply by

Management Zone. Additionally, Figure 4.29a-e presents stacked area charts showing the historical annual percentage of groundwater supply from each Management Zone.

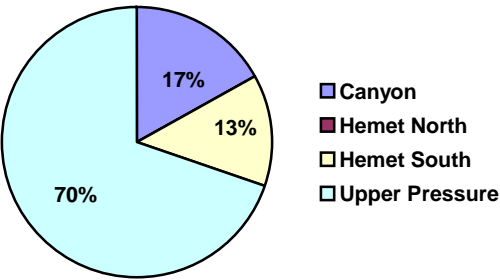


Figure 4.28a EMWD 2004 Groundwater Production, Percentage by Supply Source

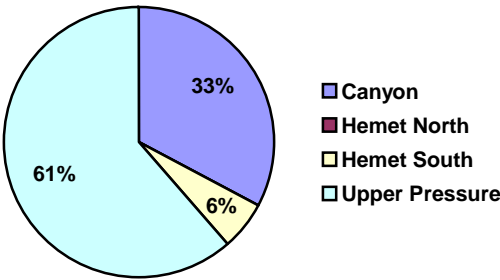


Figure 4.28b LHMWD 2004 Groundwater Production, Percentage by Supply Source

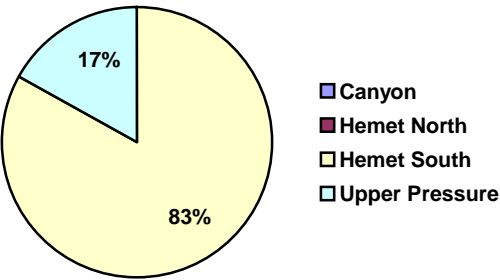


Figure 4.28c City of Hemet Water Service Area 2004 Groundwater Production, Percentage by Supply Source

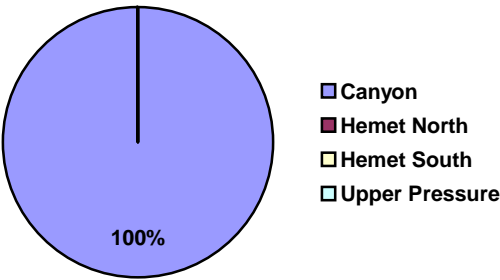


Figure 4.28d Soboba 2004 Groundwater Production, Percentage by Supply Source

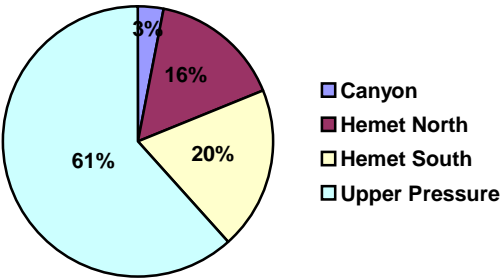


Figure 4.28e Private Water Producers 2004 Groundwater Production, Percentage by Supply Source

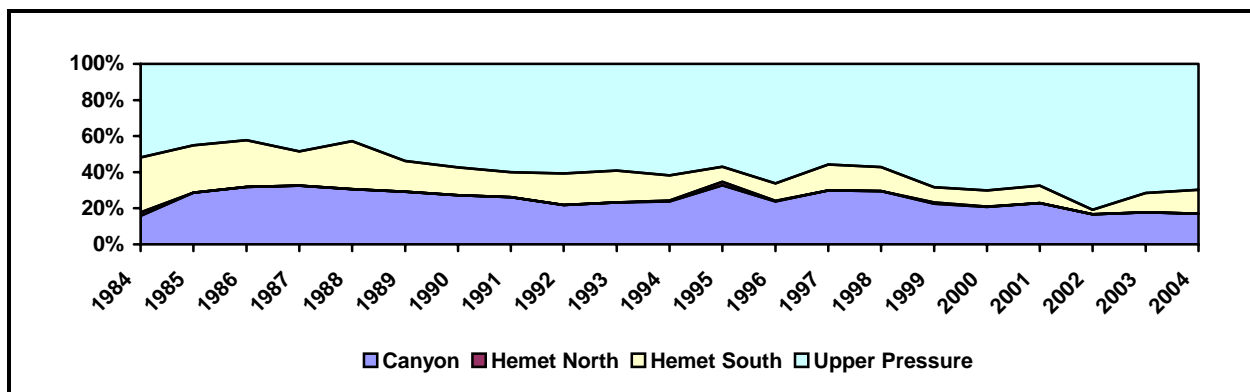


Figure 4.29a EMWD Historical Groundwater Production, Percentage by Supply Source

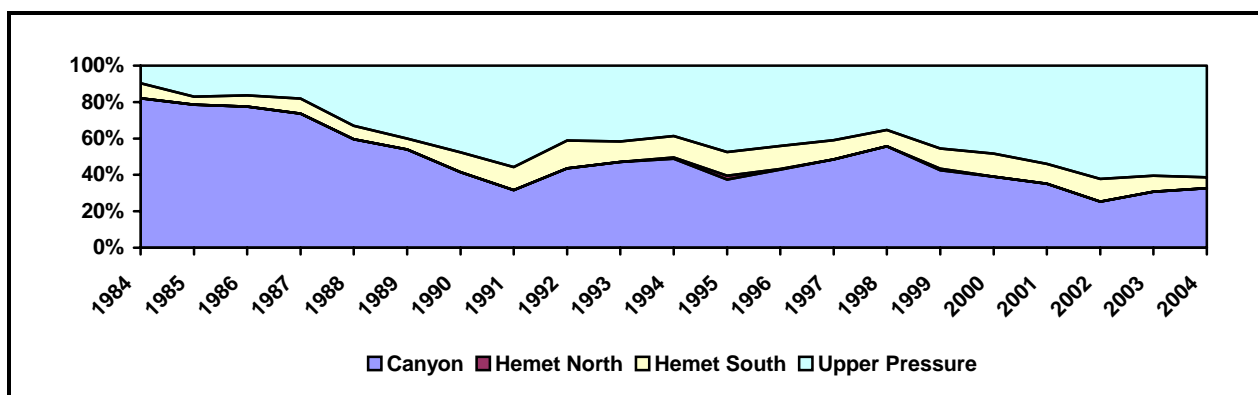


Figure 4.29b LHMWD Historical Groundwater Production, Percentage by Supply Source

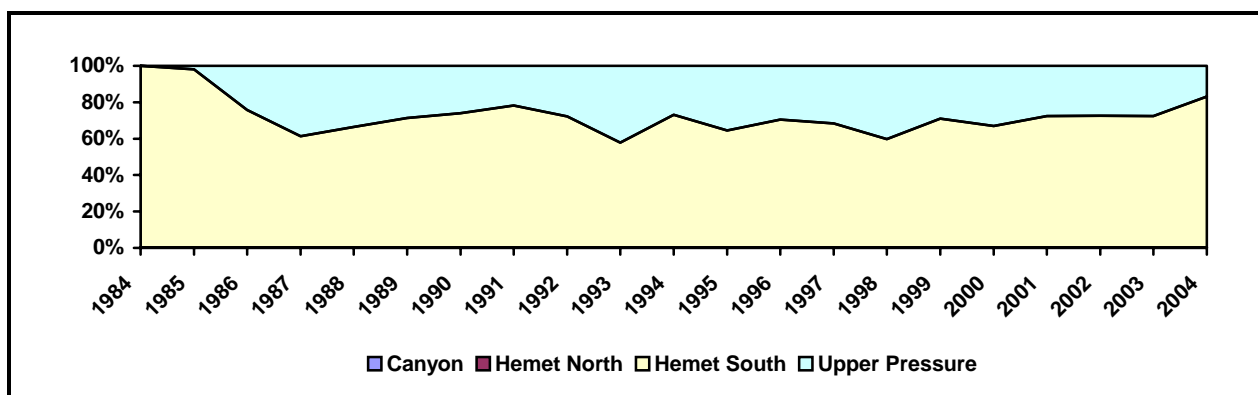


Figure 4.29c City of Hemet Water Service Area Historical Groundwater Production, Percentage by Supply Source

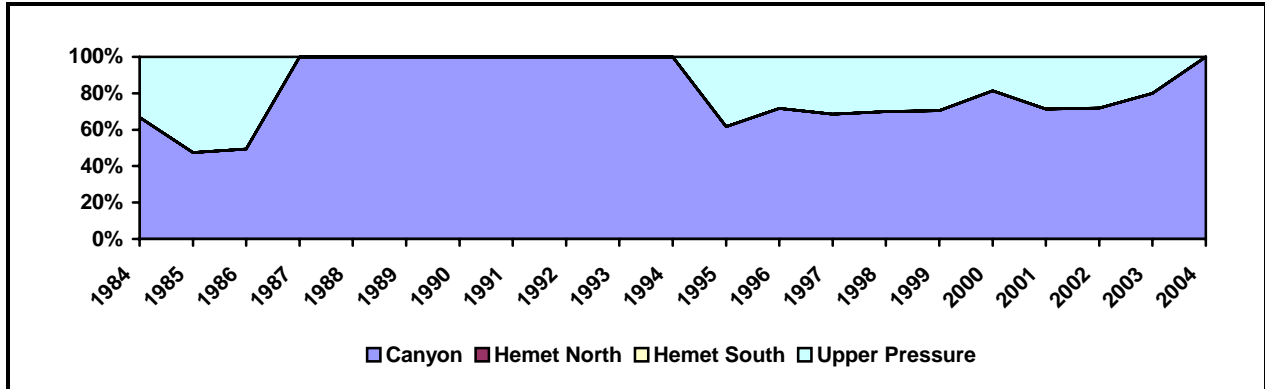


Figure 4.29d Soboba Historical Groundwater Production, Percentage by Supply Source

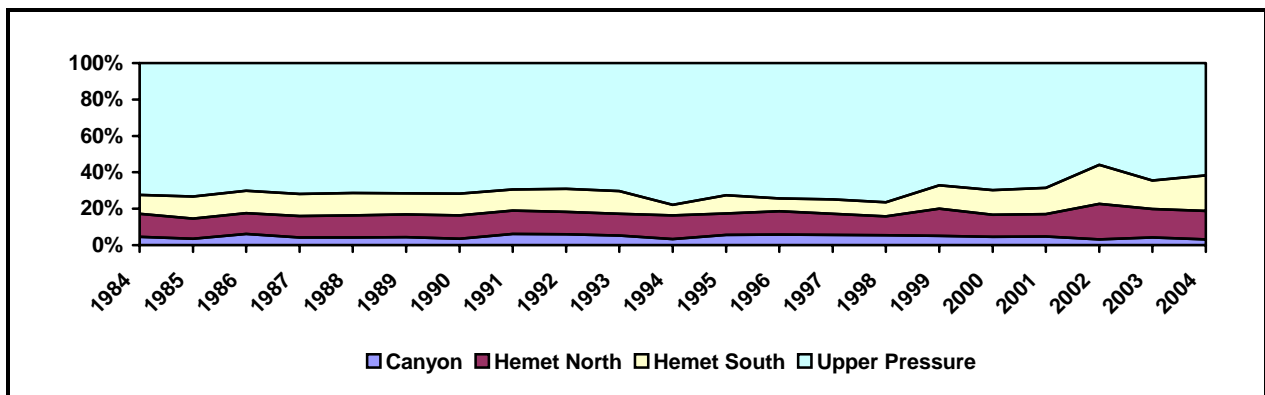


Figure 4.29e Private Water Producers Historical Groundwater Production, Percentage by Supply Source

The pie charts show that in 2004 the Upper Pressure Management Zone provided the majority of groundwater for four of the six entities. The Hemet South Management Zone provided the majority of water to the City of Hemet Water Services Area and The Canyon Management Zone provided all groundwater for the Soboba Tribe.

The only significant trend seen in the 1984 - 2004 historical annual charts is LHMWD's shift in groundwater sources from majority Canyon Management Zone water in the mid-1980s to mostly Upper Pressure Management Zone water recently. These charts also emphasize the importance of the Upper Pressure Management Zone, as it was a component of the groundwater supply for all entities over the 1984 – 2004 time period.

4.8.2 IMPORTED WATER

EMWD is a member agency of the MWD, and, as such, is able to import water from Northern California via the State Water Project and from the Colorado River Aqueduct. Imported water is used for supply as well as for groundwater recharge; this section only discusses imported

water for supply, imported water for recharge is discussed in Section 4.6.1. District-wide, imported water comprises 80% of EMWD's total potable water supply. However, imported water is a small portion of EMWD's water supply in the Management Area due to the availability of high quality groundwater, which is less common in the rest of the EMWD service area. Over the 1984-2004 period, imported water represented 13% of EMWD's supply and 2% of the total Management Area supply (WRIME, 2003a). In 2004, imported water represented 41% of EMWD's supply and 9% of the total supply for the Management Area (EMWD, 2005a,b).

The usage of imported water for direct use has been variable over the past decades, as shown in Figure 4.30. The volume of water imported was reduced in 1991 as the importation of unfiltered Colorado River water to the Management Area was curtailed to meet the requirements of the Surface Water Treatment Rule, part of the Safe Drinking Water Act.

Imported water usage in recent years has increased, which in turn reduced the stress on groundwater resources in the Management Area.

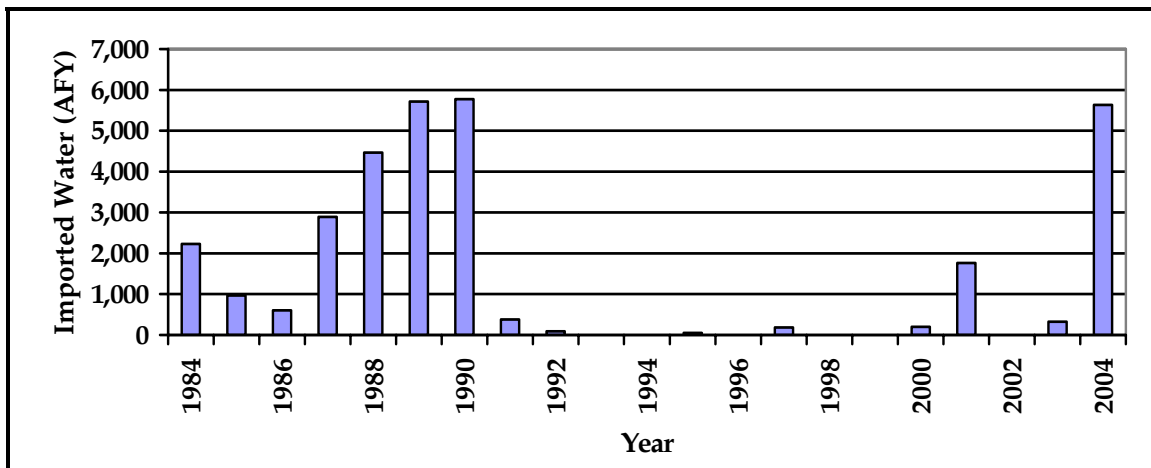


Figure 4.30 Annual Imported Water Supply

4.8.3 RECYCLED WATER

Recycled water is treated at EMWD's San Jacinto Valley Regional Water Reclamation Facility and is currently used primarily for irrigation in the public municipal areas, industrial uses, and agricultural irrigation purposes in the Management Area and for habitat creation at the California Fish and Game San Jacinto Wildlife Area outside the Management Area. Recycled water is a highly reliable source of supply and will increase in availability as the population of the Management Area increases. Most of the recycled water is sold by EMWD to private land owners for agricultural irrigation. Recycled water usage in the Management Area has been fairly stable over the past decades, with approximately 5,000 AF supplied in 2004. Annual amounts of recycled water use are presented in Figure 4.31.

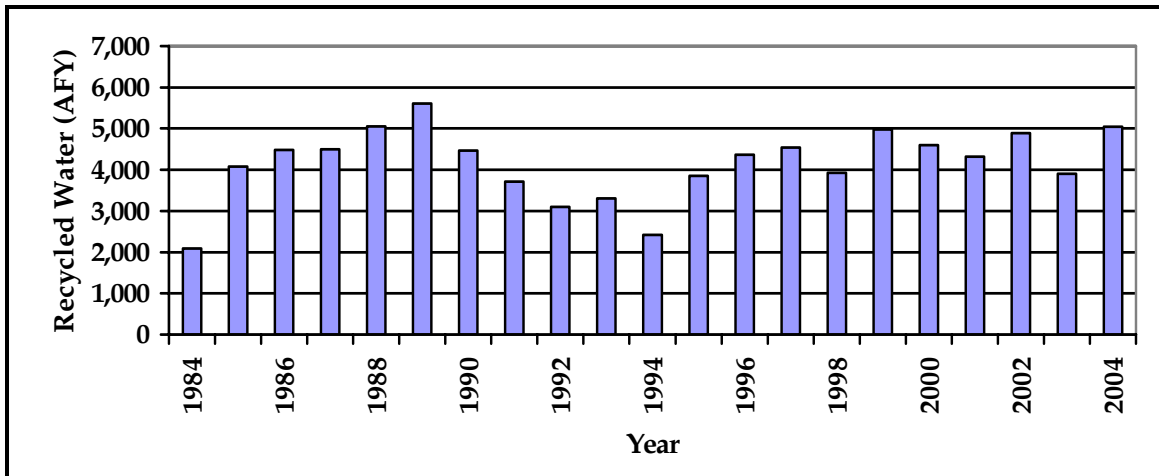


Figure 4.31 Annual Recycled Water Supply

4.8.4 SURFACE WATER

LHMWD has pre-1914 rights for the diversion and storage of surface water from the San Jacinto River and its tributaries. These rights date back to the late 1800s, and the diversion amounts are filed each year with the Division of Water Rights, State Water Resources Control Board on Annual Notices of Groundwater Extraction or Diversion, numbers G330016, G330017, and G330018.

When available, LHMWD diverts surface water for direct use. It should be noted that the San Jacinto River is an ephemeral river. The river may not flow every year and, therefore, there may be occasional years where diversion is not possible. Annual surface water diversions for 1985-2004 are shown in Figure 4.32. Details of the surface water rights are discussed in Section 7.1.

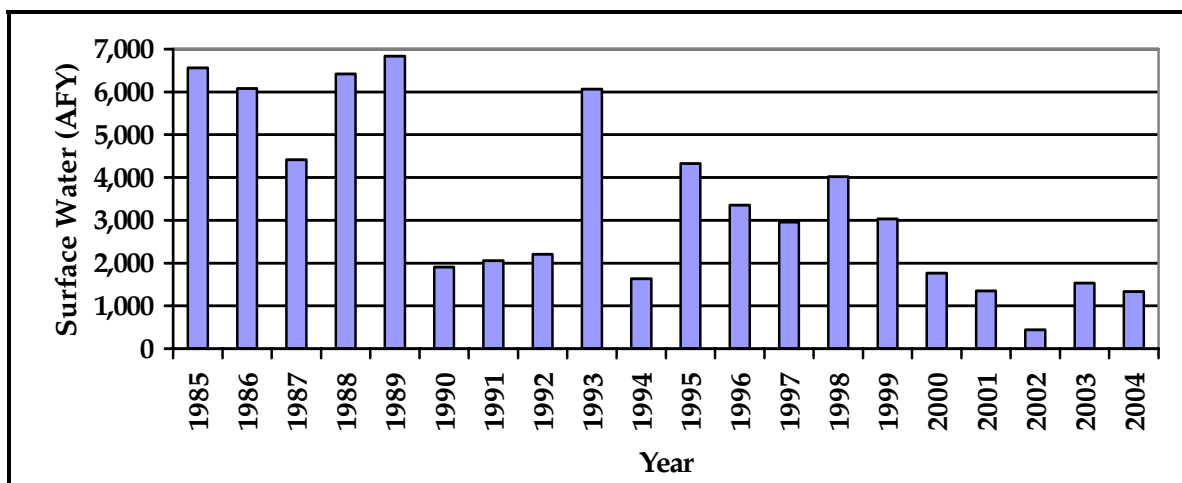


Figure 4.32 Annual Surface Water Supply

EMWD's surface water diversions are not utilized for direct use and are therefore not considered part of the water supply. More information on EMWD's surface water diversions is included in Section 7, Surface Water Rights.

4.8.5 PURCHASES FROM EMWD

LHMWD, City of Hemet, and City of San Jacinto purchase water from EMWD to supplement their water supplies. The annual volume of water sold to the other agencies by EMWD is shown in Figure 4.33. In addition to these sales, EMWD sells recycled water to private land owners for agricultural irrigation.

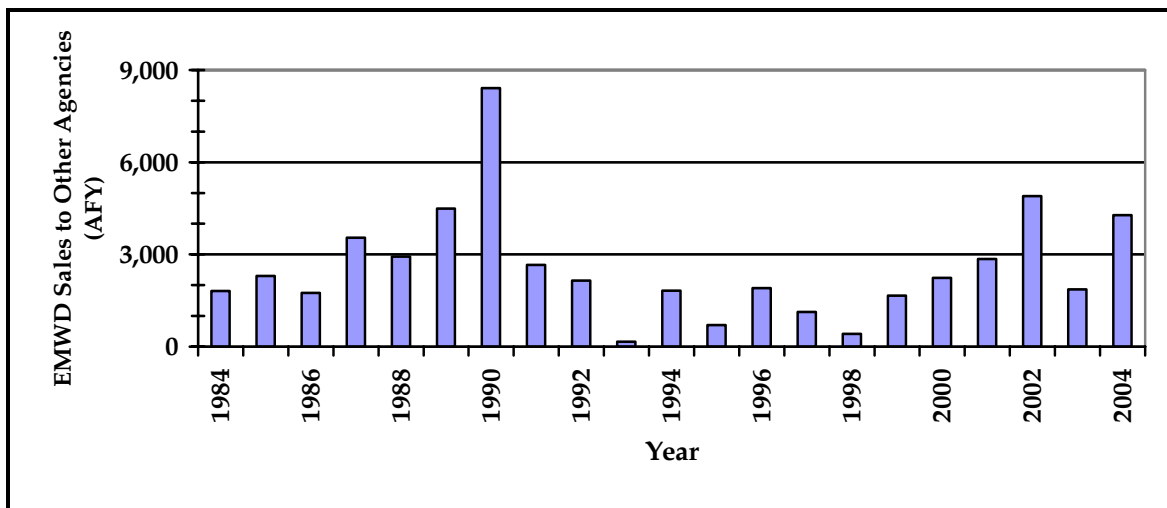


Figure 4.33 Annual Sales by EMWD to Other Agencies within Management Area

4.9 ESTIMATES OF SAFE YIELD AND OVERDRAFT

4.9.1 SAFE YIELD

The Safe Yield of the Management Area is defined in the Stipulated Judgment as the long term, average quantity of water supply in the Management Area that can be pumped without causing undesirable results, including the gradual reduction of natural groundwater in storage over long-term hydrologic cycles.

The following clarifying notes are presented to better define the Safe Yield definition:

- Period of Record:** Safe Yield is a function of annual variability of the hydrology, but should reflect long-term average conditions, including wet and dry replenishment conditions. Identification of "long term, average" is important, but difficult to determine, as precipitation is highly variable from year to year and subject to long-term climatic changes. As hydrologic data will continue to be

collected and a greater understanding of the hydrology will be gained, the period of record for determining the Safe Yield will be subject to change over time.

- **Water Supply Components:** The following components of water supply are considered in the definition of Safe Yield:
 - a. Natural recharge from infiltration of precipitation,
 - b. Recharge from infiltration of streamflow and other surface water runoff,
 - c. Recharge from infiltration of irrigation applied water on agricultural lands,
 - d. Recharge from infiltration of outdoor irrigation in the urbanized areas,
 - e. Artificial recharge, such as replenishment programs, historically operated, using imported, recycled, and surface water diversions,
 - f. Subsurface groundwater inflows, such as from the Lower Pressure Management Zone and the boundaries of the basin, and
 - g. Subsurface groundwater outflows, such as to the Lakeview portion of the Lakeview/Hemet North Management Zone.
- **Study Area:** Safe Yield is calculated for the Management Area as one unit, and not by the smaller units of Management Zones.
- **Undesirable Effects:** The definition of Safe Yield emphasizes protection of groundwater in storage. It is assumed that potential undesirable effects on water quality are indirectly addressed, and therefore are not included in the analysis.

The Safe Yield of the Management Area has been estimated in a number of studies in the past. A summary of methods, hydrologic periods, and results from each study is presented in Table 4.5.

Two major methodologies have traditionally been used to estimate the Safe Yield: (1) Water Balance methodology, and (2) Change in storage methodology. These methods are briefly described below.

Table 4.5 Published Estimates of Safe Yield for the Management Area

Yield Study	Method	Time Period	Safe Yield (AFY)	Pumping (AFY)	Overdraft (AFY)
Fritz and Rosell*, 1947	Water Balance (Conventional)	1920-1945	27,400 (35,100 w/o trees/brush)	32,400	4,800
Schwartz*, 1967	Water Balance (Conventional)	1923-1960	26,100	n/a	12,100
EMWD White Paper, 2000	Water Level Recovery Analysis	Variable	50,000	60,600	10,600
GIS Recharge Estimates	Change in Storage (GIS)	1998-2003	39,700	n/a	n/a
WRIME, 2003d	Water Balance (Conventional)	1984-2001	44,700	59,000	14,300
Based on TechLink, 2002a	Water Balance (Model-based)	1984-1999	41,300	58,000	16,700

* Fritz and Rosell (1947) and Schwartz (1967) both used a larger geographic area that roughly included what is today called the San Jacinto-Lower Pressure Management Zone. This additional area is the area northwest of Bridge Street to Redlands Boulevard in Moreno Valley.

4.9.1.1 Method 1 - Water Balance Method

The water balance method utilizes inflows and outflows from the basin to estimate change in storage and the Safe Yield of the basin. The amount of pumping that can be sustained with little or no long-term change in storage is the Safe Yield of the basin. The Safe Yield estimate may be calculated by

$$\text{Safe Yield} = \text{Change in Groundwater Storage} + \text{Groundwater Production},$$

where Change in Groundwater Storage is Inflows less Outflows. The estimate must be over a long-term base period which reflects a number of wet, normal, and dry periods. Groundwater production values are based on historical data as reported by the Public Agencies and estimated for the Private Water Producers. The TC has reviewed and agreed to the data for use in the Water Balance Method. The following inflow and outflow components are used to calculate Change in Groundwater Storage for the Management Area:

Inflows

- Recharge from Retail Water Sales,
- Recharge from Irrigation Return Flow,
- Recharge from Precipitation,

- Grant Avenue Ponds Diversion Recharge,
- Reclaimed Ponds Recharge,
- Recharge from Recycled Water Sales,
- Subsurface Inflow from Other Management Zones,
- Bautista Creek Recharge,
- San Jacinto River Recharge, and
- Boundary Inflow.

Outflows

- Subsurface Outflow to Other Management Zones,
- Boundary Outflow, and
- Groundwater Production.

4.9.1.2 Method 2 - Change in Storage Methodology

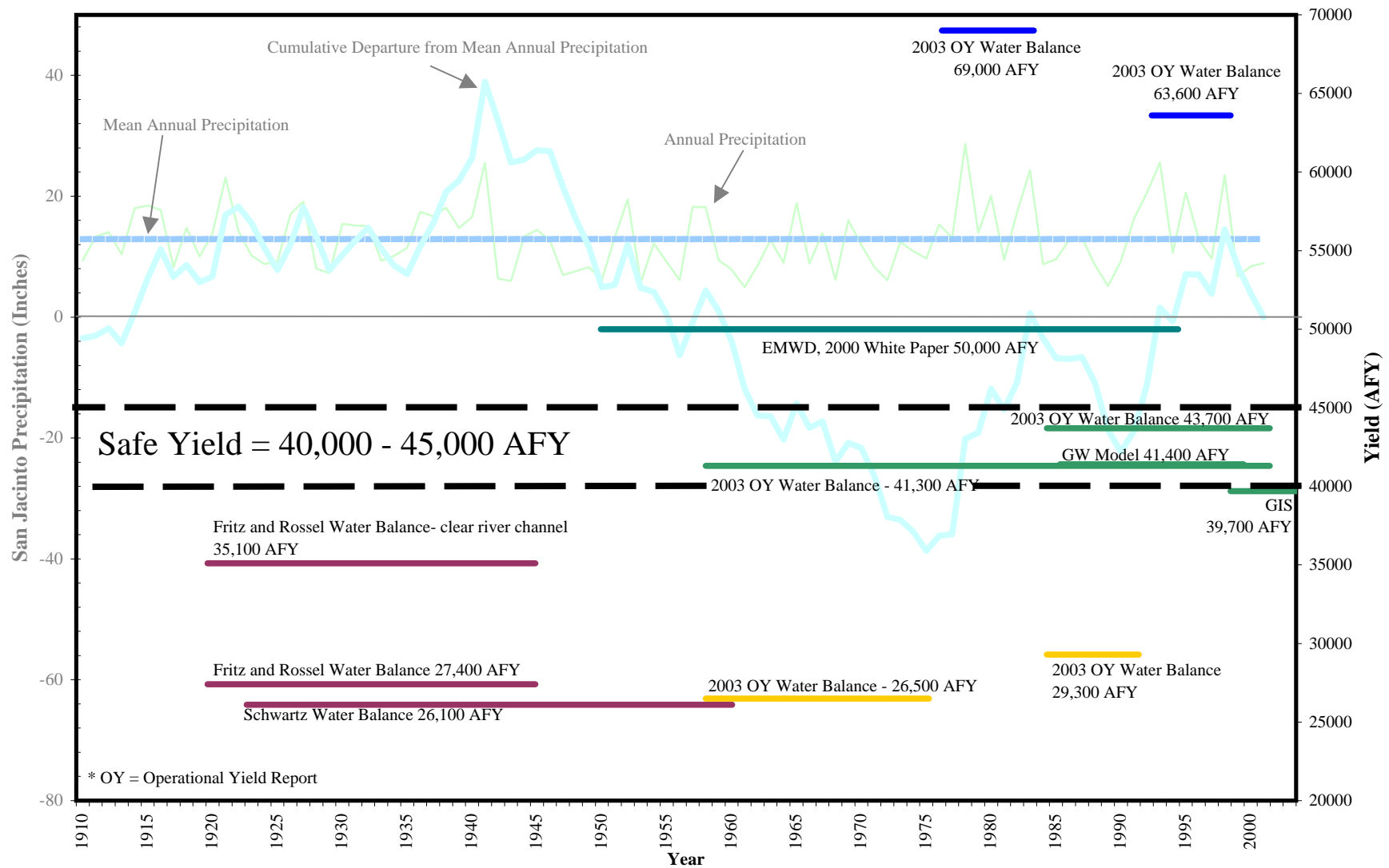
This method uses a GIS database to develop surfaces of groundwater elevations based on observed groundwater levels at multiple control points (i.e., wells) throughout the Management Area for two different time periods. The product of change in volume between the two surfaces at two different times and the specific yield of the aquifer determines the change in storage between those two time points. The Safe Yield is then calculated as the sum of the calculated change in storage and the groundwater production during the same time period. Variations of this method are used based on the spatial distribution, including vertical distribution, of the specific yield in the aquifer system.

4.9.1.3 Summary of Previous Yield Estimates

Calculation of Safe Yield is a function of the hydrologic period used in the analysis. Figure 4.34 presents the long-term hydrologic conditions as precipitation at San Jacinto gaging station (RCFC&WCD Site #186), along with estimates of the Safe Yield. As indicated in the figure, the Safe Yield estimates range from 26,400 to 44,700 AFY. Since the two estimates made by Fritz & Rosell (1947) and Schwartz (1967) are based on much older data sets and short-term hydrologic records, and the geographic area may not be consistent with some of the more recent estimates, the TC decided in its August 25, 2005 meeting not to use these estimates. Instead, the TC concluded that the Safe Yield of the Management Area ranges from approximately 40,000 to 45,000 AFY based on the most recent analyses.

The TC also concluded that the following guidelines for estimation of Safe Yield of the Management Area be considered by the Watermaster when calculating Safe Yield in the future:

Figure 4.34 Safe Yield Estimates



- Review and modify Safe Yield, if necessary, upon the recommendation of the TC or as the Watermaster may determine.
- Use latest available data with consideration for proper spatial, temporal, and vertical characteristics of the aquifer system.
- Consider a long period of record that includes above average, below average, and normal conditions.
- Consider latest methodologies that can provide more flexibility based on the available data and information, as necessary.
- Consider using the San Jacinto Watershed Groundwater Model, with appropriate updates and calibration, for re-estimation of groundwater conditions, as needed.

4.9.2 OVERDRAFT

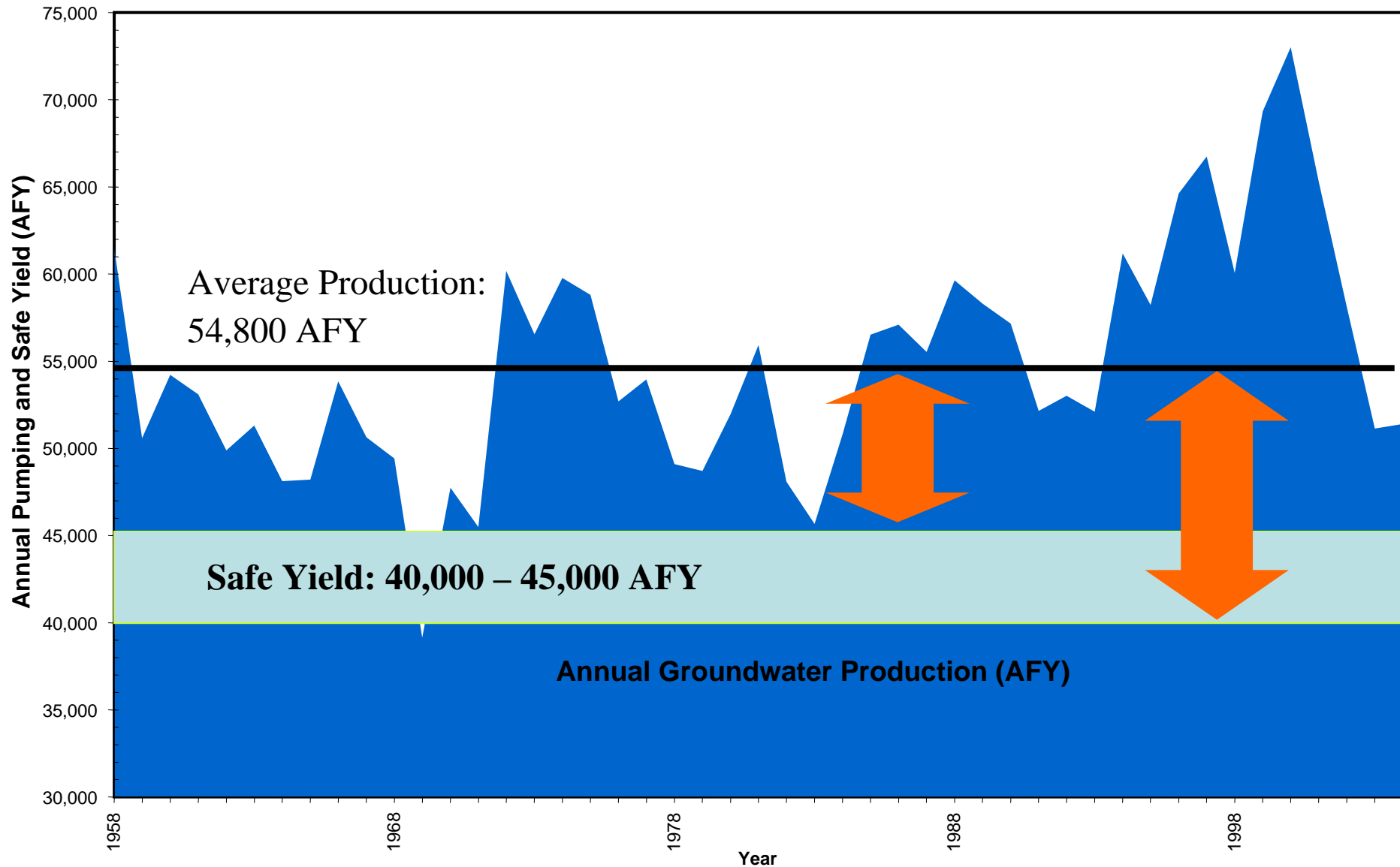
Overdraft is defined in the Stipulated Judgment as the condition whereby groundwater production in the Management Area exceeds the Safe Yield, creating undesirable conditions in the basin. The amount of overdraft is calculated as the difference between long-term average annual groundwater production in the Management Area and Safe Yield. Figure 4.35 shows the estimated annual groundwater production in the Management Area, along with the range of Safe Yield. Based on this figure, the overdraft in the Management Area is estimated to be 10,000 to 15,000 AFY. For planning purposes and to evaluate options to reduce the overdraft, this Plan assumes that the overdraft is at least 10,000 AFY.

4.10 WATER QUALITY CONDITIONS

This section presents a summary of the groundwater quality conditions in the Management Area. This description will assist in establishing a baseline condition for future water management efforts to maintain or improve groundwater quality in the Management Area. The TC has decided that the water quality conditions in the Management Area would be evaluated based on TDS and nitrate levels. This is consistent with the TIN/TDS studies (Wildermuth, 2000) and the emphasis on TDS and nitrate in the Basin Plan as amended (RWQCB, 2004).

The Management Area lies within the jurisdiction of the RWQCB, Santa Ana Region 8. The RWQCB implements state and federal laws through adoption of Water Quality Control Plans or Basin Plans (RWQCB, 1995). The Basin Plan establishes both the legal beneficial use designations and sets the standards to protect these uses. The Basin Plan was recently amended (RWQCB, 2004) to incorporate an updated TDS and Nitrogen Management Plan for the Santa Ana Region, including revised groundwater Management Zones (combining Hemet North and Lakeview into one Management Zone; Hemet North remains treated separately from Lakeview

Figure 4.35 Groundwater Production and Range of Safe Yield Estimates



in this Plan), TDS and nitrate quality objectives for groundwater, TDS and Nitrogen waste load allocations, and stream reach designations.

Within the Santa Ana Watershed, which includes the Management Area, a statistical method has been developed to use nitrate (as N) and TDS to evaluate the status of water quality; to compare sub-basin concentrations; and to trigger management actions (RWQCB, 2004; Wildermuth, 2000, 2005). Point statistics were used to show (i) historical ambient water quality conditions as represented by the 1954-1973 time period, (ii) 1997 Current ambient water quality conditions as represented by the 1978-1997 time period, and (iii) 2003 Current ambient water quality conditions as represented by the 1984-2003 time period. A summary of the data is shown in Table 4.6, revealing nitrate (as N) levels below the MCL of 10 mg/L for all cases. TDS exceeds the recommended secondary MCL of 500 mg/L in Hemet South (current and historical) and Hemet North (current and historical), and TDS exceeds the maximum secondary MCL of 1000 mg/L in the 1997 current levels in Hemet South.

Table 4.6 Historical (1954-1973), 1997 Current (1978-1997), and 2003 Current (1984-2003) Ambient Nitrate as N and TDS Concentrations (mg/L)

Sub-basin	Nitrate as N ¹				TDS ²			
	Basin Plan Objective ³	Historical	1997 Current	2003 Current	Basin Plan Objective ⁴	Historical	1997 Current	2003 Current
Canyon	2.5	2.5	1.6	2.1	230	234	220	420
Upper Pressure	1.4	1.4	1.9	1.7	320	321	370	370
Hemet South	4.1	4.1	5.2	5.4	730	732	1030	850
Hemet North	1.8	1.8	2.7	3.4	520	519	830	840

Source: Wildermuth, 2005. 2003 update 1984-2003)

¹ Table 3-2

² Table 3-1

³ Basin Plan Amendment, 2004 (Table 5-4)

⁴ Basin Plan Amendment, 2004 (Table 5-3)

The point statistics and water quality objectives were used by the RWQCB to develop estimates of assimilative capacity. Areas with assimilative capacity are able to accept waters with higher concentrations of a constituent than the concentration in the receiving waters because natural processes such as recharge and dilution will allow for the water quality objectives to continue to be met. The most recent computations indicate that Hemet South, Hemet North, Canyon, and Upper Pressure Management Zones do not currently have assimilative capacity for TDS. For nitrate, the Hemet South, Hemet North, and Upper Pressure Management Zones do not have

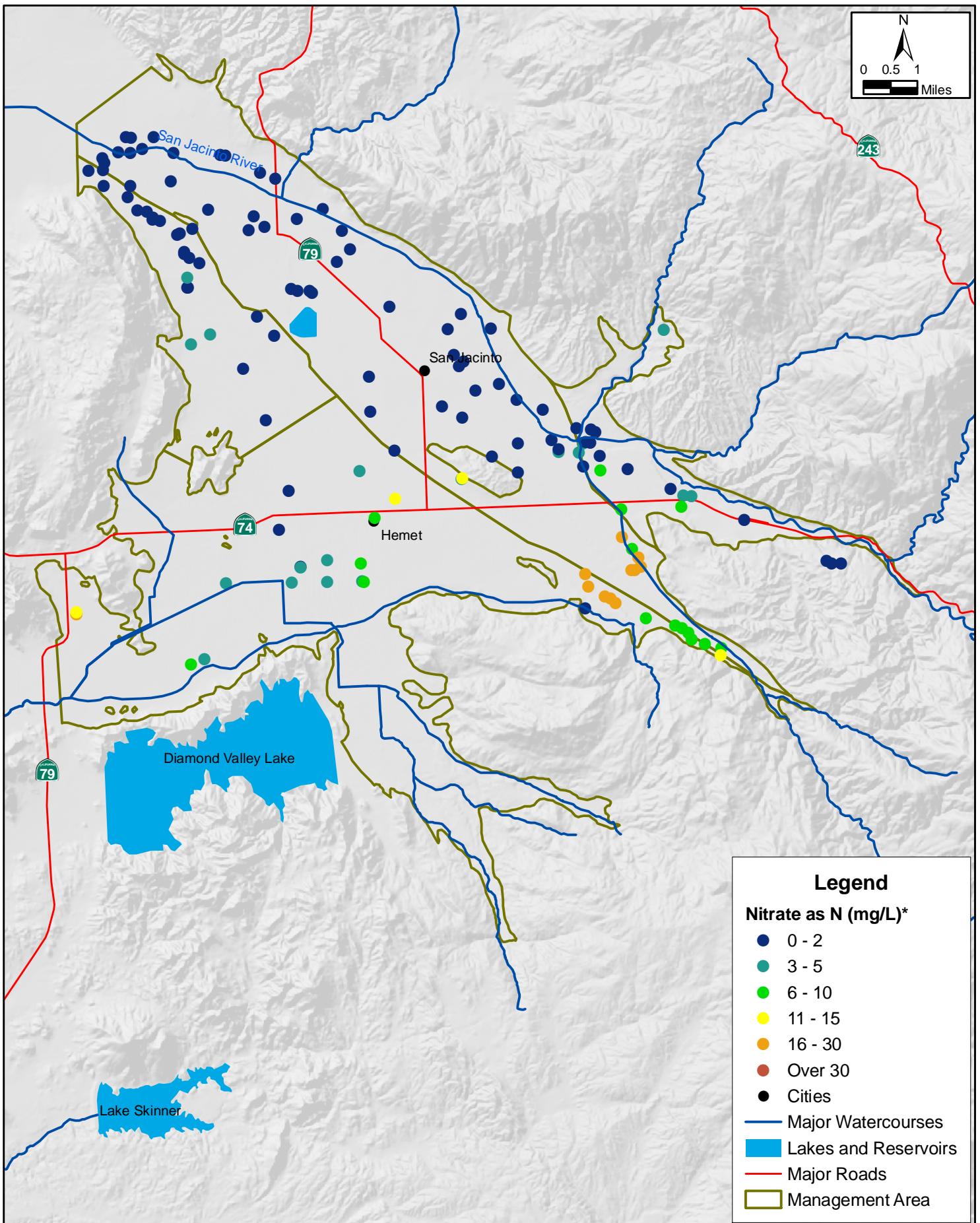
assimilative capacity remaining, and the Canyon area has only a very small amount of nitrate that it can assimilate (0.4 mg/l nitrate as N; Wildermuth, 2005).

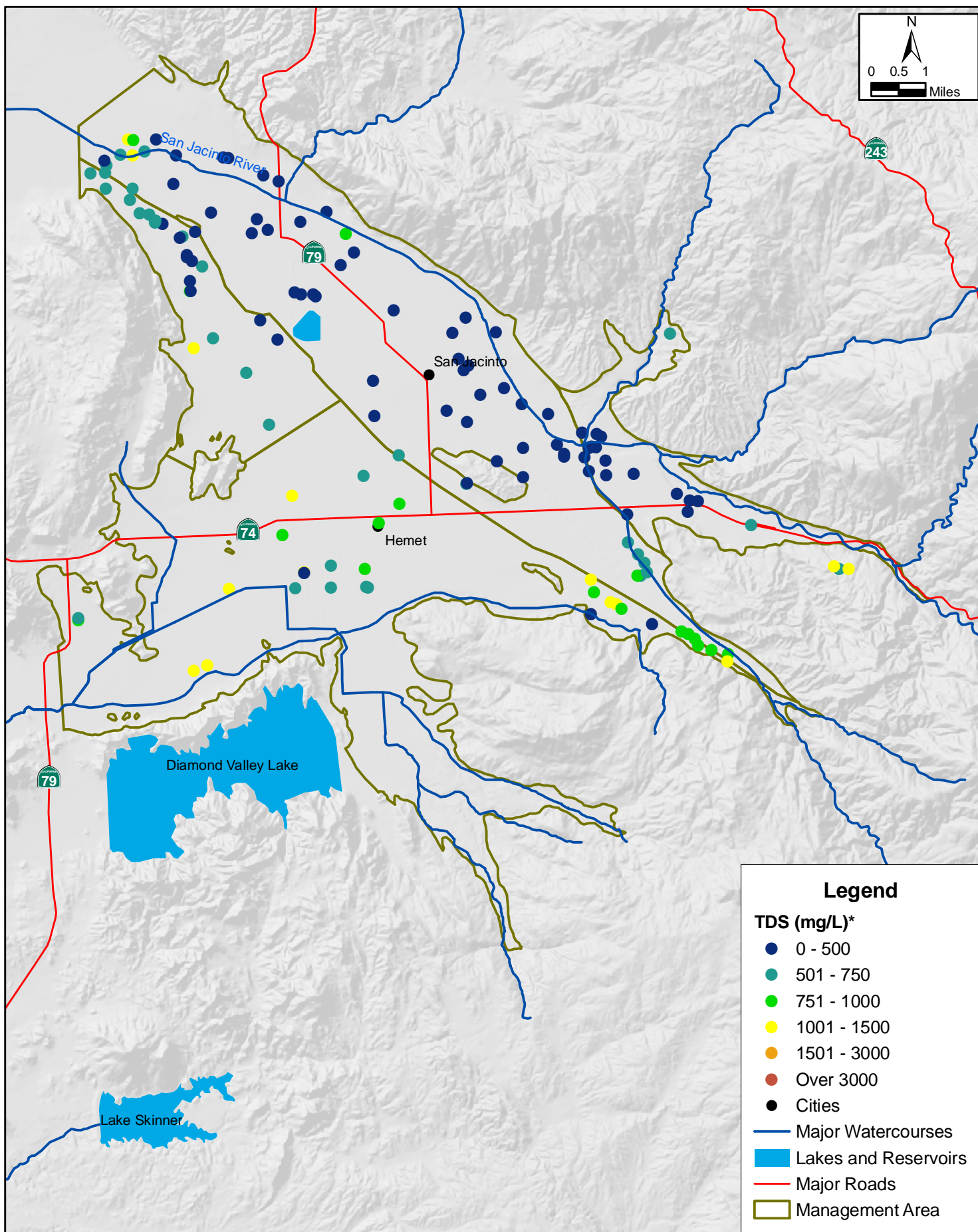
Table 4.7 shows the changes seen over the 30-year time period between the historical and 2003 Current time periods. The Canyon Management Zone shows a decrease in nitrate as N concentrations while all other nitrate (as N) and TDS concentrations for all other Management Zones show increases in concentrations of between 0.3 and 1.6 mg/L nitrate (as N) and 49 to 321 mg/L TDS. It should be noted that changes seen between these time periods are a combination of true changes in ambient water quality and artificial changes due to limitations in monitoring data and the estimation technique (Wildermuth, 2005). In the future, as current monitoring programs assemble more data, a long-term record of analytical data at specific wells will be available to better show changes over time at specific locations.

Table 4.7 Change in Ambient Concentration (mg/L) of Nitrate as N and TDS, Between Historical (1954-1973) and 2003 Current (1984-2003) Time Periods

Sub-basin	Change in Nitrate as N (mg/L)	Change in TDS (mg/L)
Canyon	-0.4	186
Upper Pressure	0.3	49
Hemet South	1.3	118
Hemet North	1.6	321

The most recent data from public and private wells, as compiled by EMWD, were used to plot the 2004 nitrate (as N) and TDS conditions as shown in Figures 4.36 and 4.37. While these values are taken from wells screened at different depths, the plots show the general variability in concentrations across the Management Area.





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5.1 PROJECTED LAND USE CONDITIONS

This Section presents a brief description of the projected land use conditions in the Management Area. Figure 5.1 shows the general land use categories at build-out.

Area UWMPs echo the projected urban growth indicated in the build-out land use:

- EMWD UWMP – EMWD service area population, including areas outside the Management Area, projected to increase from 494,000 in 2005 to 830,000 in 2025. (EMWD, 2005a)
- LHMWD UWMP – LHMWD service area population projected to increase from 39,100 in 2005 to 49,500 in 2025. (LHMWD, 2005)
- Hemet UWMP:
 - City of Hemet population projected to increase from 78,600 in 2005 to 154,000 in 2025; and
 - City of Hemet water system service area population projected to increase from 20,200 in 2005 to 22,300 in 2025. (Hemet, 2006)
- San Jacinto UWMP:
 - City of San Jacinto population projected to increase from 34,100 in 2005 to 63,600 in 2025; and
 - City of San Jacinto water system service area population projected to increase from 13,200 in 2005 to 24,000 in 2025. (San Jacinto, 2005)

The total land use acreage for each category is estimated and presented in Table 5.1.

Based on Tables 5.1 and 4.3, the urban area is projected to increase from 28% in the 1998 survey to 65% at build out. This increase is due to a combination of conversion of agricultural land and undeveloped land to urban uses. These future conversions have significant implications on the total projected water demand in the Management Area, as well as impacts on the precipitation, runoff, and recharge conditions. This concept is further discussed in the following sections.

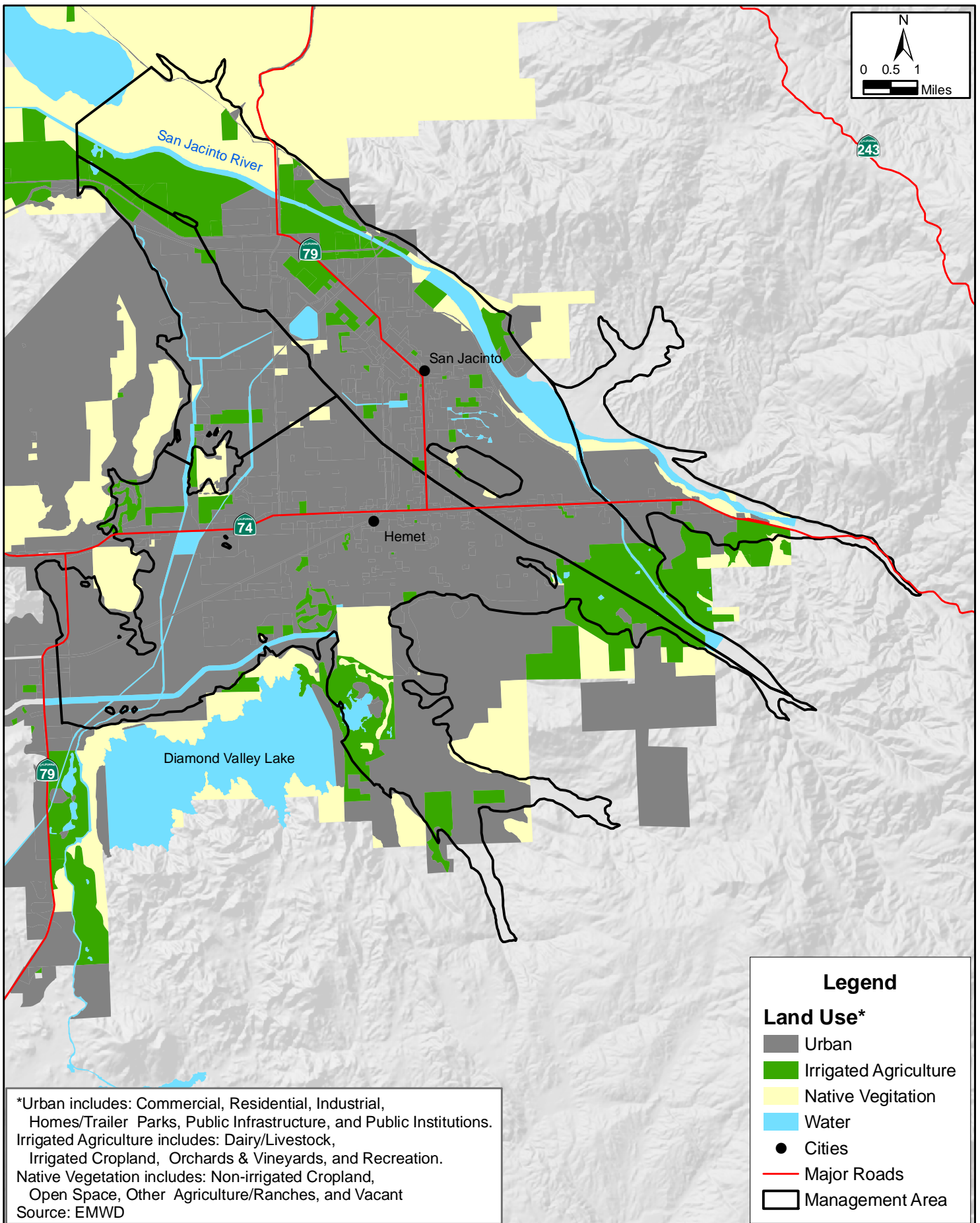


Table 5.1 Generalized Projected Acreage in the Management Area

Land Use	Total Acreage	Percent
Urban	37,100	65%
Irrigated Cropland	8,100	14%
Non-Irrigated Cropland	4,500	8%
Water	3,600	6%
Unmapped*	4,000	7%
Total	57,300	100%

*Unmapped areas are outside EMWD's service area and were not included in the EMWD ultimate land use dataset.

Source: EMWD ultimate land use (1998), based on city general plans

5.2 PROJECTED WATER DEMANDS

Projected water demands are based on information contained in 2005 UWMP, the *Hemet/San Jacinto Water Management Area 2004 Annual Report* (EMWD, 2005b), and *Basin Assessment Report Technical Memorandum No. 1* (WRIME, 2003a). The projected water demands of each of the stakeholders and of the Management Area as a whole are described below.

5.2.1 EMWD

Projected retail water demand for the portion of EMWD's service area within the Management Area is based on the *Hemet/San Jacinto Water Management Area 2004 Annual Report*. Projected total demand is shown together with recent historical demand in Figure 5.2. Estimates of projected demand are also presented in the EMWD's 2005 UWMP, but these values are for the entire EMWD service area; the UWMP system-wide projections show a similar rate of increase in water demand of approximately 50% from 2005 to 2020.

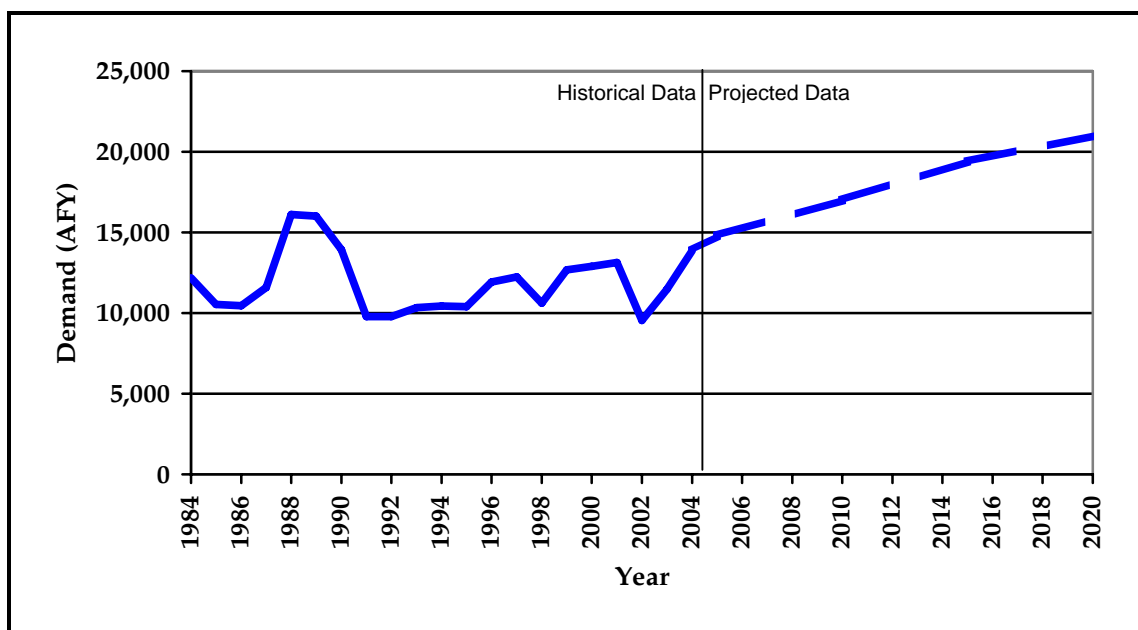


Figure 5.2 EMWD Historical and Projected Demand

5.2.2 LHMWD

Projected water demand is based on *Lake Hemet Municipal Water District 2005 Urban Water Management Plan* (LHMWD, 2005). Projected total demand is shown together with recent historical demand on Figure 5.3.

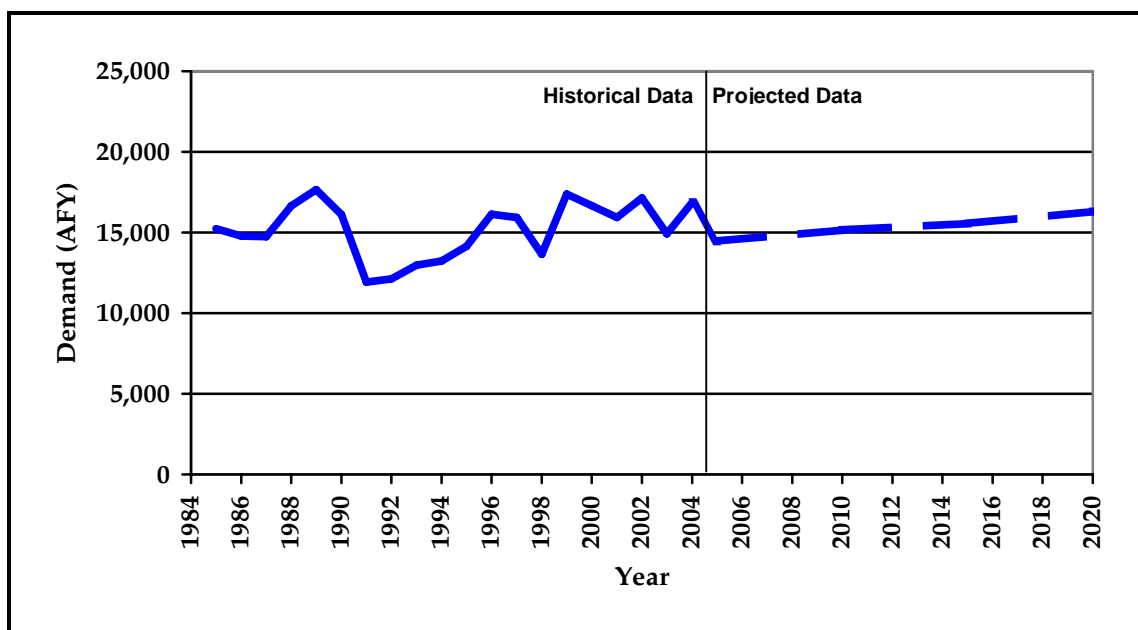


Figure 5.3 LHMWD Historical and Projected Demand

5.2.3 CITY OF HEMET WATER SERVICE AREA

Projected water demand in the City of Hemet's water service area is based on *City of Hemet 2005 Urban Water Management Plan* (Hemet, 2006). Projected demand is shown together with recent historical demand on Figure 5.4.

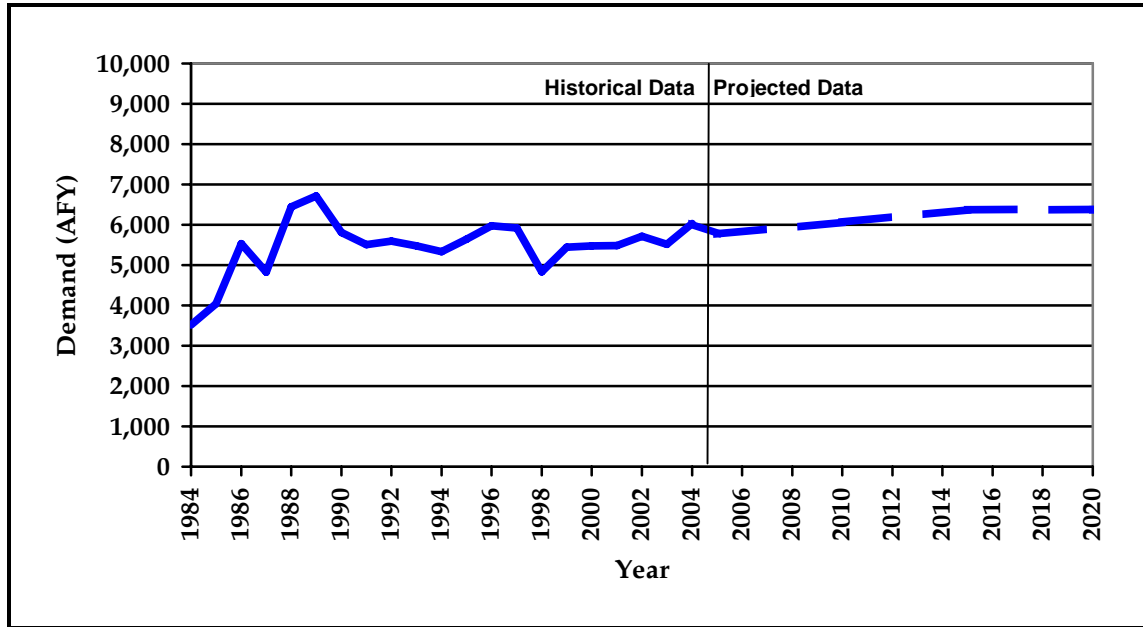


Figure 5.4 City of Hemet Water Service Area Historical and Projected Demand

5.2.4 CITY OF SAN JACINTO

Projected water demand in the City of San Jacinto's water service area is based on *City of San Jacinto 2005 Urban Water Management Plan* (San Jacinto, 2005). Projected demand is shown together with recent historical demand on Figure 5.5.

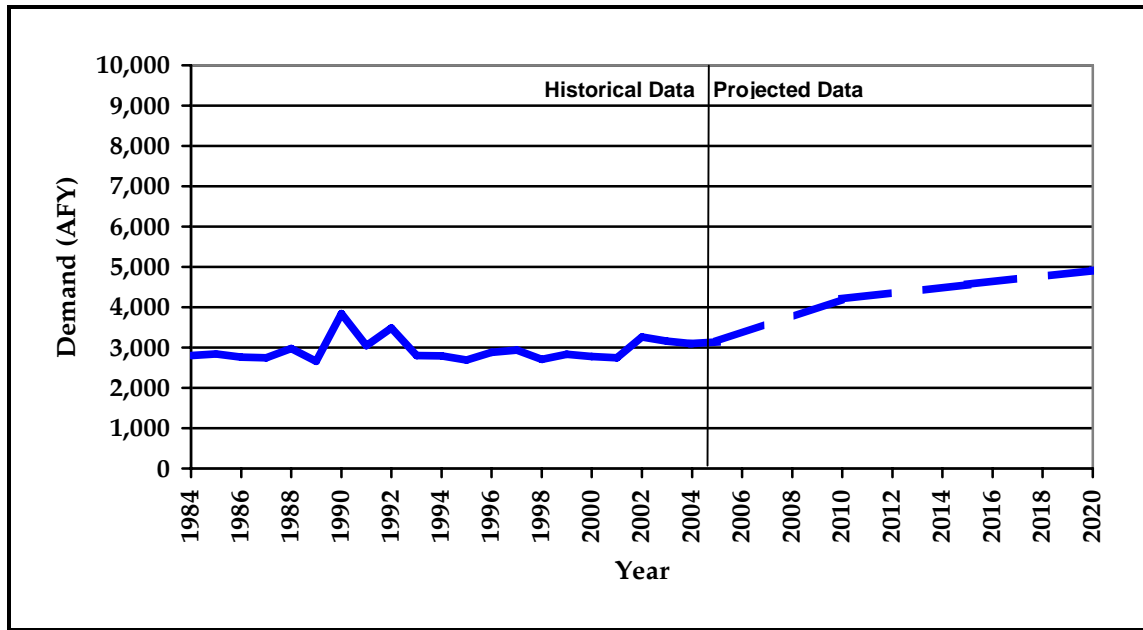


Figure 5.5 City of San Jacinto Water Service Area Historical and Projected Demand

5.2.5 SOBOBA TRIBE

Projected water demand for the Soboba Tribe is taken from the Settlement Agreement, assuming that the Settlement Agreement is implemented in 2008. Projected total demand is shown together with recent historical demand on Figure 5.6.

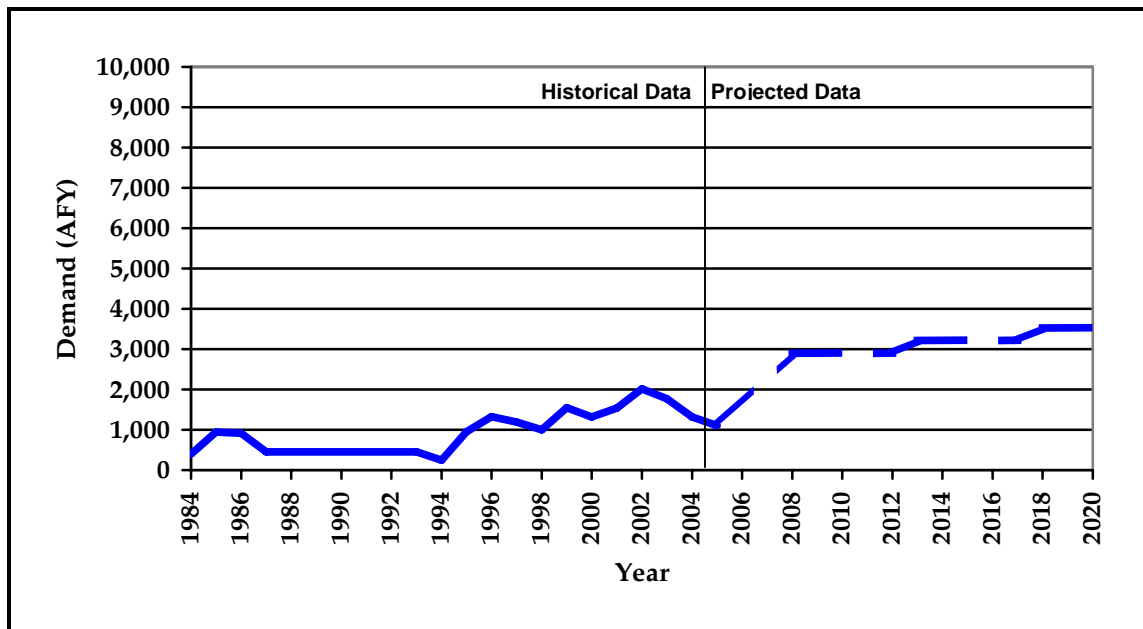


Figure 5.6 Soboba Tribe Historical and Projected Demand

5.2.6 PRIVATE WATER PRODUCERS

Projected water demand for the Private Water Producers is a refinement of estimates presented in the Operational Yield Study (WRIME, 2003d) based on updated information on current and future development and their impact on water demand. Figure 5.7 shows the assumed future agricultural water use by local producers together with recent historical demand.

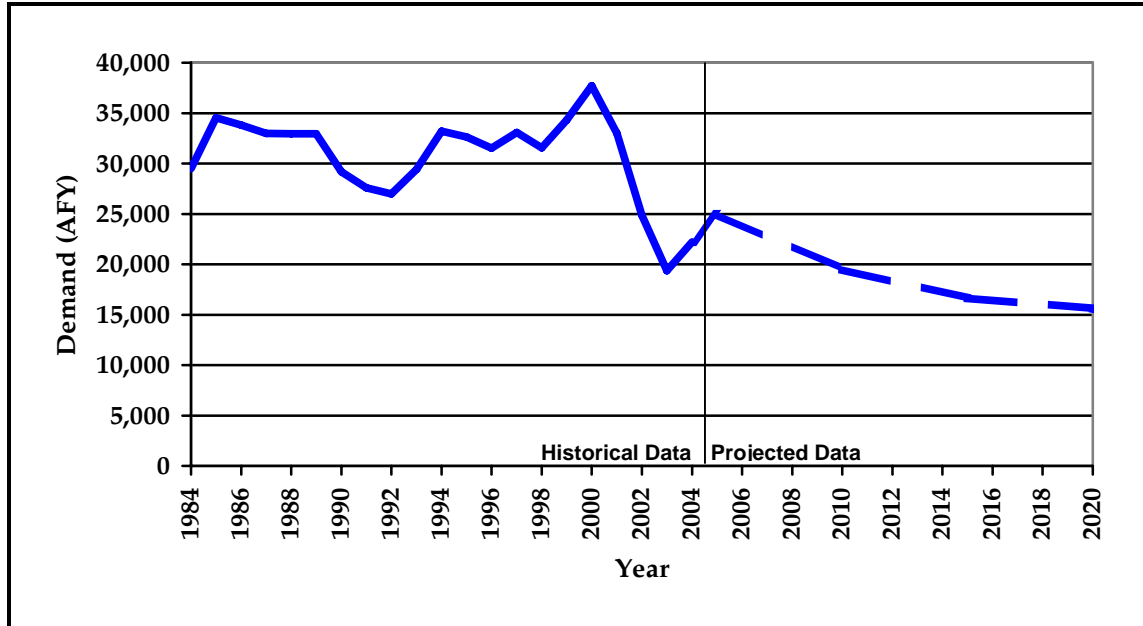


Figure 5.7 Private Water Producers Historical and Projected Demand

5.2.7 MANAGEMENT AREA

Projected and historical water demand for the Management Area as a whole presented in Figure 5.8 as the sum of the demand for the individual entities presented in the previous subsections.

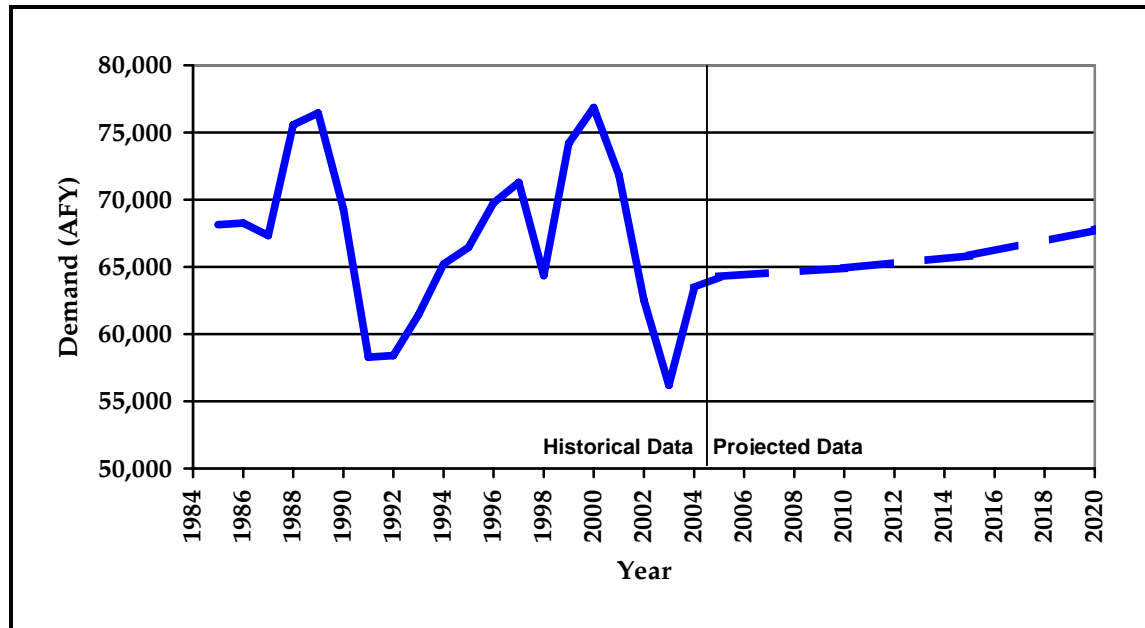


Figure 5.8 Management Area Historical and Projected Demand

5.3 FUTURE PLAN PHASES

The Integrated Recharge and Recovery Project is considered to be the core of the Physical Solution. The project is designed and implemented in two Phases. Phase I is described in Section 3 of this Plan. While Phase II facilities are described at the conceptual level, and the EIR is certified, there are additional projects that have been considered by the TC and will need to be evaluated for possible design and implementation. Following is a discussion of Phase II of the IRRP, along with other potential projects.

5.3.1 SAN JACINTO RIVER INTEGRATED RECHARGE AND RECOVERY PROJECT, PHASE II

Phase II of the project consists of construction of the remaining portions of the San Jacinto Integrated Recharge and Recovery Project. The information presented here is based on previously published documents adjusted based on the latest knowledge at the time of publication from ongoing negotiations with regulators. Phase II will provide up to 110 cfs of recharge water capacity and will cost approximately \$50 million*. A schematic of Phase II is shown in Figure 5.9. Major activities during Phase II are:









1. **Construction of Recharge Basins** - This activity includes construction of nine additional recharge ponds within the San Jacinto River bed in three clusters of

* Number has been updated since the publication of the IRRP Feasibility Report.

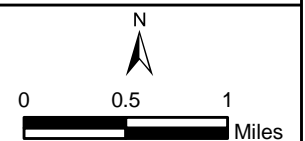
Hemet / San Jacinto
Water Management
Plan
**Schematic of Integrated
Recharge Recovery
Program - Phases I and II**

Figure 5.9

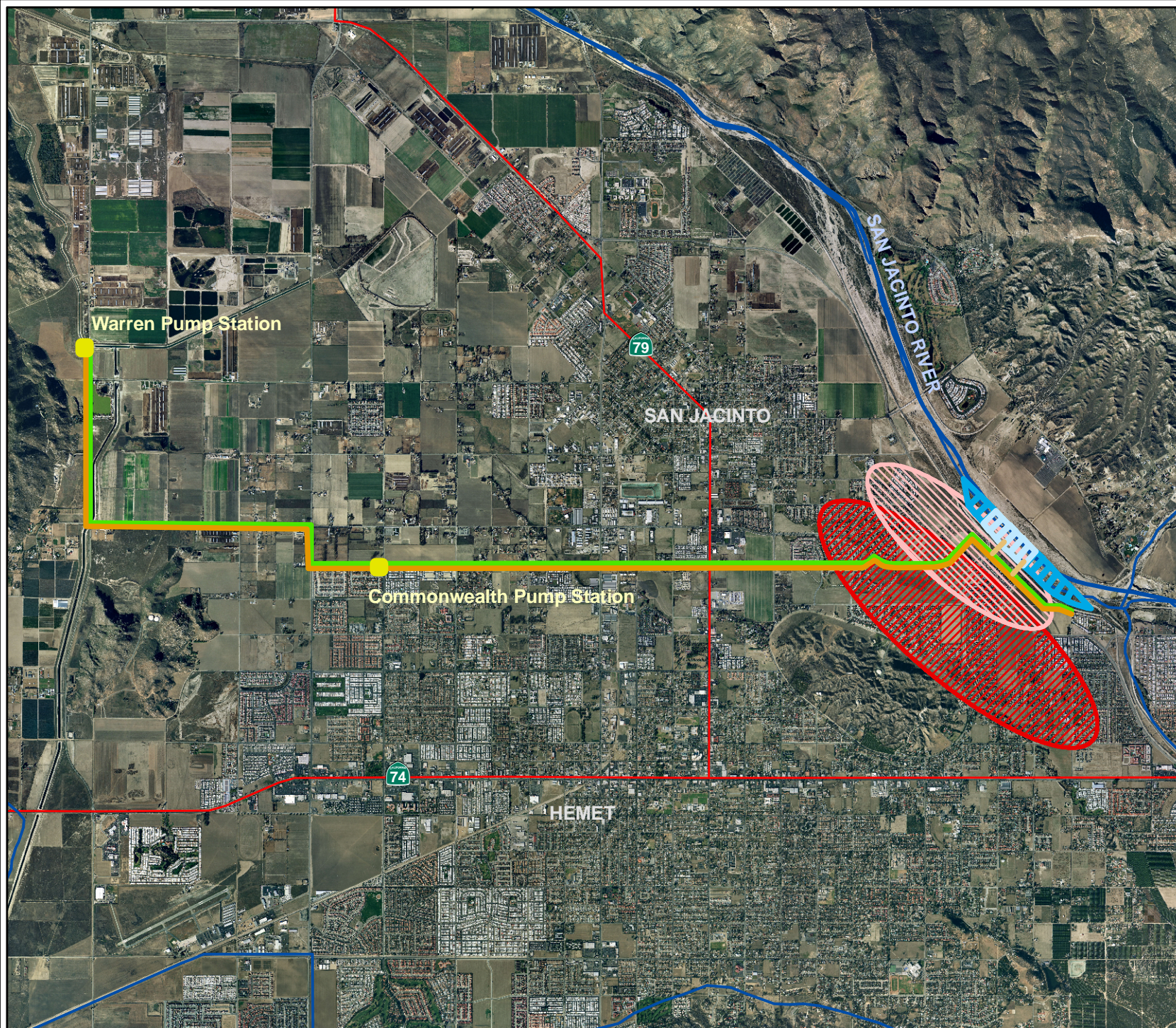
Legend

-  Pump Station
-  Phase I Pipeline
-  Phase II Pipeline
-  Phase I Ponds
-  Phase II Ponds
-  Existing Pipeline
-  Phase I Well Field
-  Phase II Well Field

Source: EMWD



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three basins each, covering approximately 35 acres. Combined Phases I and II will have 15 basins covering approximately 70 acres*.

2. **Construction of Pipelines** - This includes design and construction of a 7.7 mile water supply pipeline from the EM-14 turnout to the proposed recharge basins. Included is increasing the capacity of the EM-14 turnout structure from 40 cfs to 110 cfs; replacing 200 feet of 48-inch-diameter pipeline with 63-inch-diameter pipeline; constructing 15,800 feet of new 54-inch-diameter pipeline paralleling the existing 39-inch-diameter pipeline; and constructing 24,800 feet of new 57-inch-diameter pipeline paralleling the existing 33-inch-diameter pipeline.
3. **Pump Station Upgrades** – Upgraded or new pump stations would be built to increase capacity at the Warren Road and Commonwealth pump stations.
4. **Drilling of Extraction Wells** - This includes construction and testing of up to five additional extraction wells designed and operated identically to those constructed in Phase I. The construction of these new wells will result in a total of up to eight Phase I and II extraction wells.
5. **Design and Construction of Monitoring Wells** – Up to three additional monitoring wells will be constructed, bringing the total number of Phase I and II monitoring wells to up to six wells.

Only Phase I has been designed in detail and funding sources are being secured.

5.3.2 POTENTIAL CONJUNCTIVE USE PROJECTS

Conjunctive use is the coordinated operation of surface water storage and use, groundwater storage and use, and conveyance facilities to meet water management needs. This recognizes that there is a hydrologic connection between the surface water resource and the groundwater resource (DWR, 2006). In the Management Area, conjunctive use helps utilize available subsurface storage along with seasonally available water (imports and local surface water) or recycled water. Methods currently being considered include direct recharge and in-lieu recharge.

As part of the basin planning process, the TC identified and selected seven potential direct recharge sites and two potential in-lieu recharge projects for further evaluation and prioritization out of a pool of 15 direct recharge sites and two in-lieu projects initially considered. Further information is provided in *Hemet/San Jacinto Basin Assessment – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 2, Analysis of Impacts of Conjunctive Use Projects* (WRIME, 2003c).

The recharge sites were selected based on screening criteria that included:

* Number has been updated since the publication of the IRRP Feasibility Report.

- General site characteristics (size, recharge needs, ownership, etc.),
- Hydrogeologic suitability,
- Sub-basin interaction,
- Engineering suitability,
- Land use suitability, and
- Environmental impacts.

The seven potential direct-recharge sites and two in-lieu projects are shown on Figure 5.10. In general, the direct recharge sites would utilize imported water, surface water, or recycled water to recharge the groundwater through surface spreading; the in-lieu projects (Upper Pressure In-Lieu Project and Hemet-Simpson CU Area) were designed to reduce the amount of groundwater production by delivering imported water, from either the Colorado River or the State Water Project, to be used in conjunction and coordination with local groundwater.

A preliminary description of the recharge sites is presented based on information from City of Hemet, City of San Jacinto, LHMWD, and EMWD, along with a brief review of available reports. Table 5.2 summarizes the findings for the nine potential projects. All findings are tentative planning-level data and should not be used in any intensive analysis without further research.

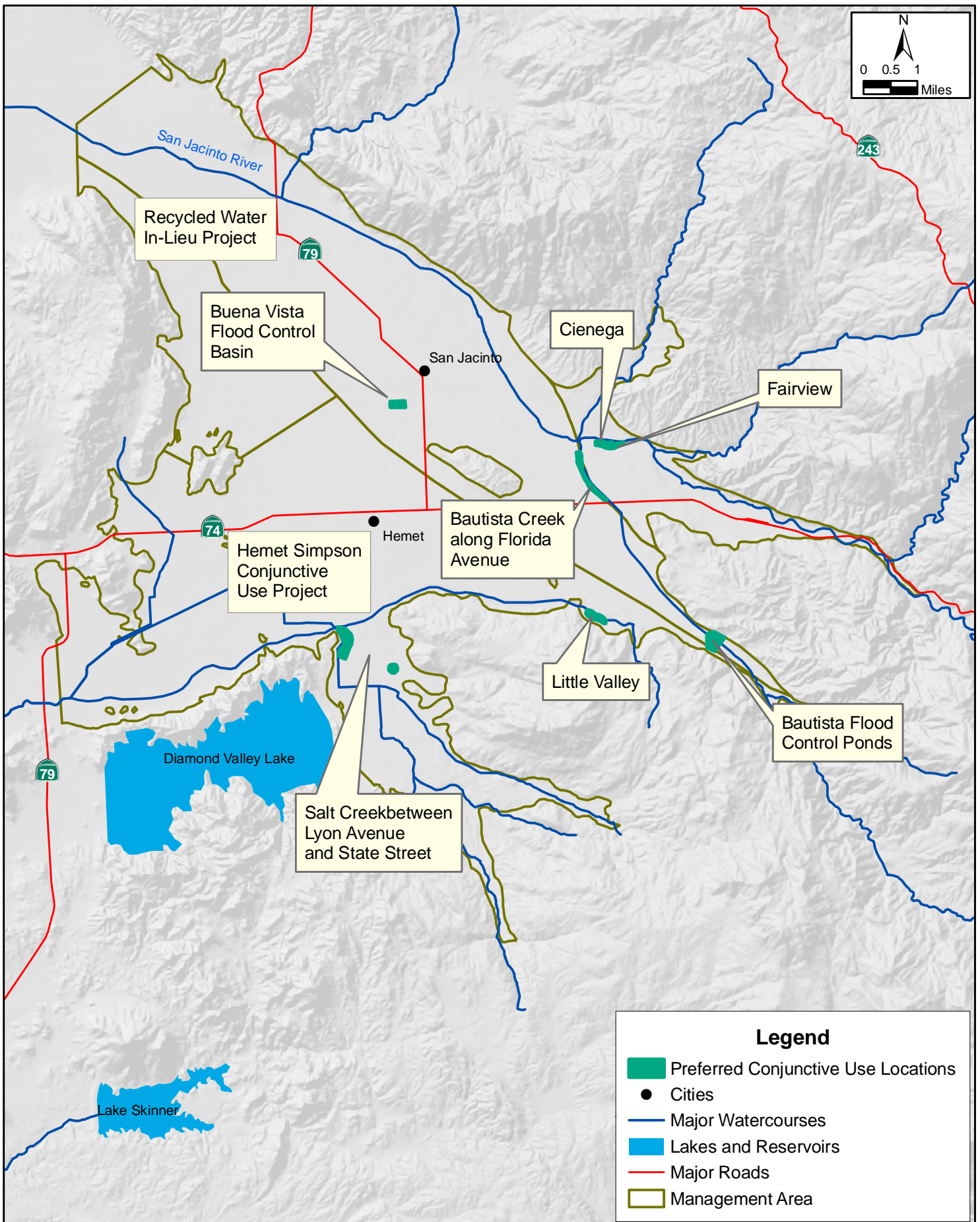
The identification of the potential sites allows for the concentration of future work on these sites. The future work includes:

- Evaluation of the general site conditions;
- Evaluation of water supply availability and reliability;
- Preparation of an environmental checklist; and
- Evaluation of the effectiveness of the projects in meeting the goals and objectives of the Management Area.

A more detailed description of each site is provided below.

5.3.3 DIRECT RECHARGE PROJECTS

Direct recharge projects involve utilizing available imported, surface, or recycled water in a constructed basin for percolation to groundwater. Successful projects require a site with high permeability to allow for water to quickly percolate to groundwater; compatible nearby land uses; an available and accessible water supply; and the ability to either recapture the water or allow the water to raise groundwater levels. The Plan supports the use of direct recharge of water of suitable quality.



Location of Nine Preferred Projects

Hemet / San Jacinto Water Management Plan

October 2007

Figure 5.10

Table 5.2 Summary of Selected Conjunctive Use Site Conditions

Site	Project Type	Water Source	Annual Water Availability	Soils Infiltration Rate	Approximate Depth to Water (ft)	Potential Constraints
Buena Vista Flood Control Basin	Recharge	Runoff, recycled, or imported	600 AF	n/a	200 – 250	Groundwater quality
Cienega	Recharge	River diversion	n/a	High	210 - 240	Kangaroo Rat, water rights
Fairview	Recharge	River diversion	n/a	High	210 - 240	Kangaroo Rat, water rights
Bautista Creek along Florida Avenue	Recharge	Irrigation water, Bautista Creek, imported	n/a	Moderate	n/a	n/a
Salt Creek between Lyon Avenue and State Street	Recharge	Salt Creek diversion/runoff	1,000 AF	Moderate	200 - 250	n/a
Little Valley	Recharge	Runoff, LHMWD flume, imported	n/a	High and variable	85	Potential archeological sites, shallow bedrock
Bautista Flood Control Ponds	Recharge	Surface runoff/ river diversion	n/a	n/a	180 - 210	No proponent
Upper Pressure In-lieu Project	In-lieu	Imported (Colorado River)	n/a		n/a	Must gain agreements between many parties
Hemet-Simpson Conjunctive Use Project	In-lieu	Imported (Colorado River and State Water Project)	n/a		n/a	Must gain agreements between many parties

5.3.3.1 Buena Vista Flood Control Basin

The existing Buena Vista flood control basin has been identified as a potential recharge project site. Buena Vista basin, located at the end of Buena Vista Street north of Esplanade Avenue, is located in the Upper Pressure Management Zone and is owned and operated by RCFC&WCD.

The site would initially use storm water for recharge purposes. Recharge water would be conveyed to the site from the 2,700-acre drainage area by existing drainage facilities that are owned by RCFC&WCD. It is estimated that approximately 600 AF of water could be delivered to the basin via runoff, with a first flush volume of approximately 20 AF. Surface water quality is good, with some elevated levels of oil and grease, suspended residues, and iron, based on sampling on March 6, 1992 (Singh, 1992). The basin can be enlarged through excavation to provide an additional 36 AF of storage volume, approximately equal to the average storm event runoff.

There is an existing EMWD raw water pipeline that runs nearby along Oakwood Street. This pipeline could potentially be used to supply the project with recycled or imported water (if supplies were to be available) in the future, although it would require the construction of an approximately 4,000-foot pipeline to connect to the basin.

The following items should be considered before moving forward with this project:

- Availability of the site for use and coordination with flood control needs;
- Surface water quality;
- Water infiltration potential;
- Deep percolation potential;
- Availability of imported water to augment surface runoff;
- Subsurface conditions; and
- The clogging potential of surface soils with local runoff.

5.3.3.2 Cienega and Fairview

The Cienega and Fairview sites are adjacent, thus conditions are essentially the same and described together. Preference between the two sites would be based on political, engineering, environmental, and operational factors.

The Cienega and Fairview sites are located in the Canyon Management Zone. Fairview was first used in the early 1990s by LHMWD. LHMWD cut basins near the riverbed and placed a diversion dam in the river. Water was diverted into the basins during the rainy season, typically the 1st quarter of the year. Future use of Fairview, potentially by LHMWD and/or EMWD, would likely involve an expansion of the basin area. Water would be supplied from the river during periods of increased flow, typically January through March. Imported water could also be used if water becomes available and the infrastructure could be built. Infiltration rates are considered high based on monitoring well responses during LHMWD's use, a study by EMWD at the Cienega blowoff pond, and the prevalence of coarse-sand riverbed deposits.

Potential problems for development of the project include San Bernardino Kangaroo Rat habitat, water rights, and limited available underground storage.

5.3.3.3 Bautista Creek along Florida Avenue

Bautista along Florida is located along the boundary between Upper Pressure and Canyon Management Zones. There is an existing recharge site located along the west side of Bautista Creek. The creek was placed in a concrete channel in the 1970s and 1980s, reducing recharge to the aquifer system. The current recharge facility was installed in the 1960s and consists of 3 ponds located along the creek. The three ponds cover approximately 15–20 acres. Future use of the site could include increasing the pond area through expansion to the north and increasing the supply of water to the ponds. Water for the existing project is provided by a turnout that captures agricultural runoff of acceptable quality from Bautista Creek. In general, creek water is not diverted into the ponds. Currently, approximately 200-300 AFY is recharged. Future recharge activities could take advantage of the nearby imported (State Project Water) raw water line on Cedar Avenue. Percolation rates at the site are considered reasonable based on field observations of surface sediments.

5.3.3.4 Salt Creek between Lyon Avenue and State Street

Two potential sites are identified along Salt Creek for a recharge project. One site, State Street Basin, is at the State Street crossing of Salt Creek; a second site, Lyon Basin, is downstream of State Street, near Lyon Avenue. Both sites are located in Hemet South Management Zone. Lyon Basin is the preferred location and is planned to be approximately 40 acres in size and approximately 5 feet deep, resulting in a maximum storage volume of 200 AF. The volume of the State Street Basin would likely be similar to that of the Lyon Basin. Both sites would initially use storm runoff for recharge purposes. Recharge water to both sites would be conveyed to the site via Salt Creek. It is estimated that five storm events per year could each fill the Lyon Basin, resulting in delivery of approximately 1000 AF/year for recharge. Anticipated future development of the watershed will likely increase the amount of available runoff. The State Street site would likely have slightly lower volumes due to its upstream location. Due to limited upstream development, water quality is anticipated to be good.

Potential problems for development of the project include water rights, relatively shallow depth to water and relatively shallow depth to bedrock that may limit the amount and rates of recharge at the sites.

5.3.3.5 Little Valley

Little Valley is located in Hemet South Management Zone. Previously in a pilot project, water was supplied over 2 or 3 years via a LHMWD flume to the area. Water for the recharge basin would be provided by local surface runoff, the LHMWD flume, or from imported water. Infiltration testing in the past has shown rates between 0.6 and 1.4 ft/day in the central part of the valley and 2.0 and 4.6 ft/day in the eastern part of the valley (Rees, 1994).

The following items should be considered before moving forward with this project:

- Potential environmental constraints including possible archeological sites; and
- Shallow depth to bedrock may limit the amount and rate of recharge at the site.

5.3.3.6 Bautista Flood Control Ponds

The Bautista Flood Control Ponds are located in the Upper Pressure Management Zone, very close to the boundary with the Hemet South Management Zone.

The existing ponds are owned and operated by RCFC&WCD and are comprised of a debris dam that creates the 49-acre pond. Future use of the site, apart from continued flood control, would likely be for water harvesting.

5.3.4 IN-LIEU PROJECTS

In-lieu recharge projects involve reducing the usage of groundwater and substituting it with available imported, surface, or recycled water. Successful projects require water users whose needs coincide with the availability and quality of the alternate water supply. The Plan supports the use of quality direct recharge projects.

5.3.4.1 Raw Water In-Lieu Projects

Imported raw water is available from MWD and provides opportunities for in-lieu recharge projects for agricultural users or landscape irrigation. Raw water is available from the State Water Project via EM-14 and from the Colorado River Aqueduct via EM-1. Proximity to these connections is an important factor for keeping costs low for in-lieu projects. One hurdle for such projects is that the period when there is the most availability of raw water, winter, coincides with the period of lowest demand for most agricultural users. Another hurdle is the need for blending the raw water with higher quality groundwater supplies to meet the needs of some of the more sensitive users, such as dairies.

5.3.4.2 Recycled Water In-Lieu Projects

Recycled water is a reliable source of water year round and offers an opportunity for in-lieu use. Public perception generally limits the usage of recycled water to agricultural and landscape irrigation uses. The nearest source of recycled water is the San Jacinto Valley Regional Water Reclamation Facility. Proximity to this source is an important factor for keeping costs low for in-lieu projects.

One project already in the planning stages would deliver between 3,500 and 8,000 AFY of recycled water to Rancho Casa Loma and the Scott Brothers Dairy, both located roughly between Ramona Expressway and Gilman Springs Road and between Sanderson Avenue and Bridge Street in the northwestern-most portion of the Upper Pressure and Hemet North Management Zones. The delivered recycled water would coincide with an equivalent reduction in groundwater pumping by both Rancho Casa Loma and Scott Brothers Dairy. Details of the project include construction of approximately 13,000 linear feet of 24-inch pipeline, and acquisition of property in fee title and easement. Project costs would be split between the Public Agencies based on the pro-rata share of proposed production rights. Agreements with Rancho Casa Loma and the Scott Brothers Dairy would set limits on groundwater production and provide for payment of a portion of the O&M costs.

5.3.4.3 Hemet-Simpson Conjunctive Use Project

Currently MWD delivers treated water from Colorado River and State Water Project to its wholesale customers using the Skinner Water Treatment Plant. Although the Skinner plant is at full capacity, during wet years there appears to be excess water available from the plant for other potential wholesale customers.

The Simpson pump station is currently capable of pumping water to both the west and east. The treated water available from the Skinner plant would be used by customers such as the City of Hemet in lieu of groundwater pumping. The Simpson pump station has a capacity of approximately 14.5 cfs.

The following issues and constraints should be evaluated for this project:

- Quantity and timing of water available from the Skinner Plant;
- Quality of Skinner Plant water in relation to the groundwater quality used by customers such as City of Hemet, and any blending issues;
- Use of chlorinated water from Skinner Plant versus well water that does not contain chlorine;

- Transmission pipeline from Skinner line to the Simpson pump station and from Simpson pump station to local distribution system;
- Connections to the local distribution system and their impacts on the distribution system pressure zones; and
- Cost of MWD water and the cost distribution of such delivery.

5.3.4.4 Hemet Water Filtration Plant

Availability of treated imported water for distribution, in-lieu of groundwater production, has become a significant source for reducing stress on the groundwater system. One of the limiting factors in the substitution of imported water for groundwater is the ability to treat the imported water, which requires more treatment than groundwater. To allow for increased use of imported water, EMWD is building the 10 mgd (11,000 AFY) Hemet Water Filtration Plant near the intersection of Commonwealth Avenue and Kirby Street in Hemet. The plant will utilize State Water Project supplies.

The purpose of this Section is to document the background and settings in establishing the groundwater production rights for each Public Agency. The Base Production Rights and the method for determining Adjusted Production Rights have been established in a collaborative manner among the agencies, and have been the basis for the distribution of costs in a number of occasions during the development of the Plan.

6.1 PUBLIC AGENCIES BASE PRODUCTION RIGHTS

6.1.1 GENERAL

Together, the Public Agencies agreed upon some basic principles as a basis for allocating Base Production Rights. The base period for documenting actual pumping was determined to be calendar years 1995 through 1999. Figure 6.1 shows the average annual groundwater production by each Public Agency for 1995 – 1999. It was also recognized that, as a result of various operational activities of the Public Agencies, several adjustments would need to be made to the raw pumping data for 1995-1999. It was ultimately agreed to finalize all appropriate adjustments and to make one comprehensive adjustment to each Public Agency's raw 1995-1999 recorded pumping.

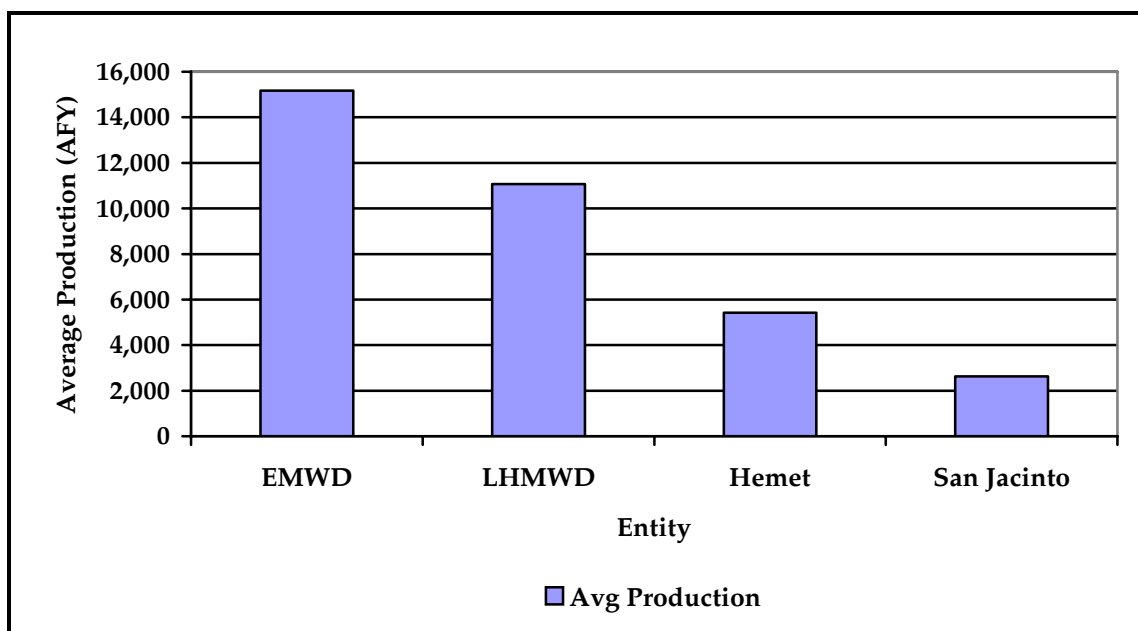


Figure 6.1 Average Annual Groundwater Production, 1995 - 1999

The operational activities that impacted groundwater resources, and therefore were used to make appropriate adjustments to raw 1995-1999 pumping data, include:

- Recharge Activities;
- MWD San Jacinto Tunnel Seepage;
- Fruitvale Entitlement Water Sold by EMWD to LHMWD, City of Hemet and City of San Jacinto;
- River Diversions;
- Conveyance Water Deliveries; and
- Other Considerations.

The Fruitvale Entitlement allocation amount was determined to be a total of 597 acre-feet for LHMWD, and Cities of Hemet and San Jacinto. The Tunnel Seepage allocation amount was determined to be 1,800 AFY, and the river diversions were determined to be 3,635 AFY for pro-rata to the four agencies. The Public Agencies have, therefore, been assigned the pro-rata shares of Base Production Rights as shown in Table 6.1:

Table 6.1 Base Production Rights

Public Agency	Base Production Rights (AFY)	Base Production Rights (Percent)
EMWD	10,869	33.7%
LHMWD	11,063	34.2%
City of Hemet	6,320	19.6%
City of San Jacinto	4,031	12.5%
Total	32,283	100 %

The details of the Public Agencies Base Production Right, with their corresponding adjustments, are described below:

6.1.2 EMWD BASE PRODUCTION RIGHTS

For EMWD, the 1995-1999 actual average annual pumping was determined to be 15,166 AFY. After consideration of all appropriate adjustments, it was determined that EMWD's Base Production Right would include a deduction of 2,497 acre-feet for conveyance water and an additional net deduction of 1,800 acre-feet for other operational activities, including tunnel seepage, export, and Fruitvale Entitlement water sales. Therefore, EMWD's Base Production Right was set at 10,869 AFY.

6.1.3 LHMWD BASE PRODUCTION RIGHTS

For LHMWD, the 1995-1999 actual average annual pumping was determined to be 11,063 AFY. There were no net adjustments for LHMWD as their credit for the Fruitvale entitlement water purchase tunnel seepage was deemed to be equivalent to their surface water diversion. Thus, the Base Production Right for LHMWD is set to 11,063 AFY.

6.1.4 CITY OF HEMET BASE PRODUCTION RIGHTS

For the City of Hemet, the 1995-1999 actual average annual pumping was determined to be 5,420 AFY. After consideration of all appropriate adjustments, it was agreed that the City of Hemet's Base Production Right would include an additional 900 AFY pumping right to account for Fruitvale Entitlement water purchase tunnel seepage credit, and surface diversion water. Therefore, the City of Hemet's Base Production Right was set at 6,320 AFY.

6.1.5 CITY OF SAN JACINTO BASE PRODUCTION RIGHTS

For the City of San Jacinto, the 1995-1999 actual average annual pumping was determined to be 2,631 AFY. However, review of the city's historic pumping showed the 1995-1999 base period was not as representative as other historic pumping periods. Therefore, it was agreed for the City of San Jacinto to receive an additional 500 AFY of pumping rights. In addition, after consideration of all other appropriate adjustments, it was determined that San Jacinto's Base Production Right would include an additional 900 AFY pumping right to account for Fruitvale Entitlement water purchase tunnel seepage credit and surface diversion water. Therefore, the City of San Jacinto's Base Production Right was set at 4,031 AFY.

6.2 PRIVATE WATER PRODUCER'S PRODUCTION RIGHTS

6.2.1 GENERAL

Development of the Hemet-San Jacinto Water Management Plan recognizes the rights of the overlying pumpers to pump and beneficially use needed groundwater. The overlying pumpers within the management area include Private Water Producers (and the Soboba Band of Luiseño Indians, discussed later). In recognition of the Private Water Producers' overlying rights, the management plan does not adversely impact or affect these rights and uses that are consistent with historical uses.

The Plan provides for the Private Water Producers to be Non-participants, Class A Participants, or Class B Participants. For Non-participants, the private producer(s) may elect to not participate and/or not acknowledge the Plan's existence. Non-participants are free to continue their past practices of pumping groundwater for beneficial uses according to state law. Non-participants are also excluded from future participation in the Plan. Class A and Class B Participants are described below.

6.2.2 CLASS A PRODUCTION RIGHTS

Class A Participants in the Plan have agreed to cooperate with the administrative and pumping accounting portions of the Plan. While historic pumping and beneficial uses may continue, the Class A Participants' pumping facilities are subject to metering, testing, and water level and water quality sampling at no cost to the owner. This information is valuable for successful implementation of the Plan. Class A participants are eligible to convert to Class B Participant status during the first three years of formal Plan implementation (Entry of the Judgment), with the payment of all past assessments (without interest) that would have been incurred as a Class B Participant.

6.2.3 CLASS B PRODUCTION RIGHTS

Class B Participants become participants to the Plan and have their water rights determined. The annual Base Production Right shall be determined based upon the average annual production from 1995 to 1999, less any amount of water that had been used on land that was developed for non-agricultural purposes after 1999, which is the Participant's Base Production Right. The Class B Participant shall pay Replenishment Water Assessments for pumping in excess of the individual Base Production Right. Class B Participants are not subject to Administrative Assessments, and until conversion to a Public Agency, not subject to reduction in Safe Yield. Class B Participants may sell or lease unused groundwater to the Watermaster or one of the Public Agencies, under terms and conditions approved by the Watermaster. 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 credit, to the extent legally permissible, the Class B Participant's Base Production Right, adjusted pursuant to certain reductions, against any requirement then in effect for any water supply assessment requirements, or against 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 added to its Base Production Right as set forth in the Judgment. Class B Participants to the Plan have also agreed to participate in the groundwater monitoring and pumping accounting portion of the Plan, at no cost to the owner.

6.3 SOBOBA TRIBE WATER RIGHTS

Section 8 of this document provides a detailed description of the Soboba Indian Tribe water rights.

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This Section provides a description of the surface water rights and licenses held by LHMWD and EMWD. The contents of this Section are provided for general information and documentation of the surface water rights only; such rights are not affected by the Stipulated Judgment or this Plan.

7.1 LHMWD'S DIVERSION RIGHTS

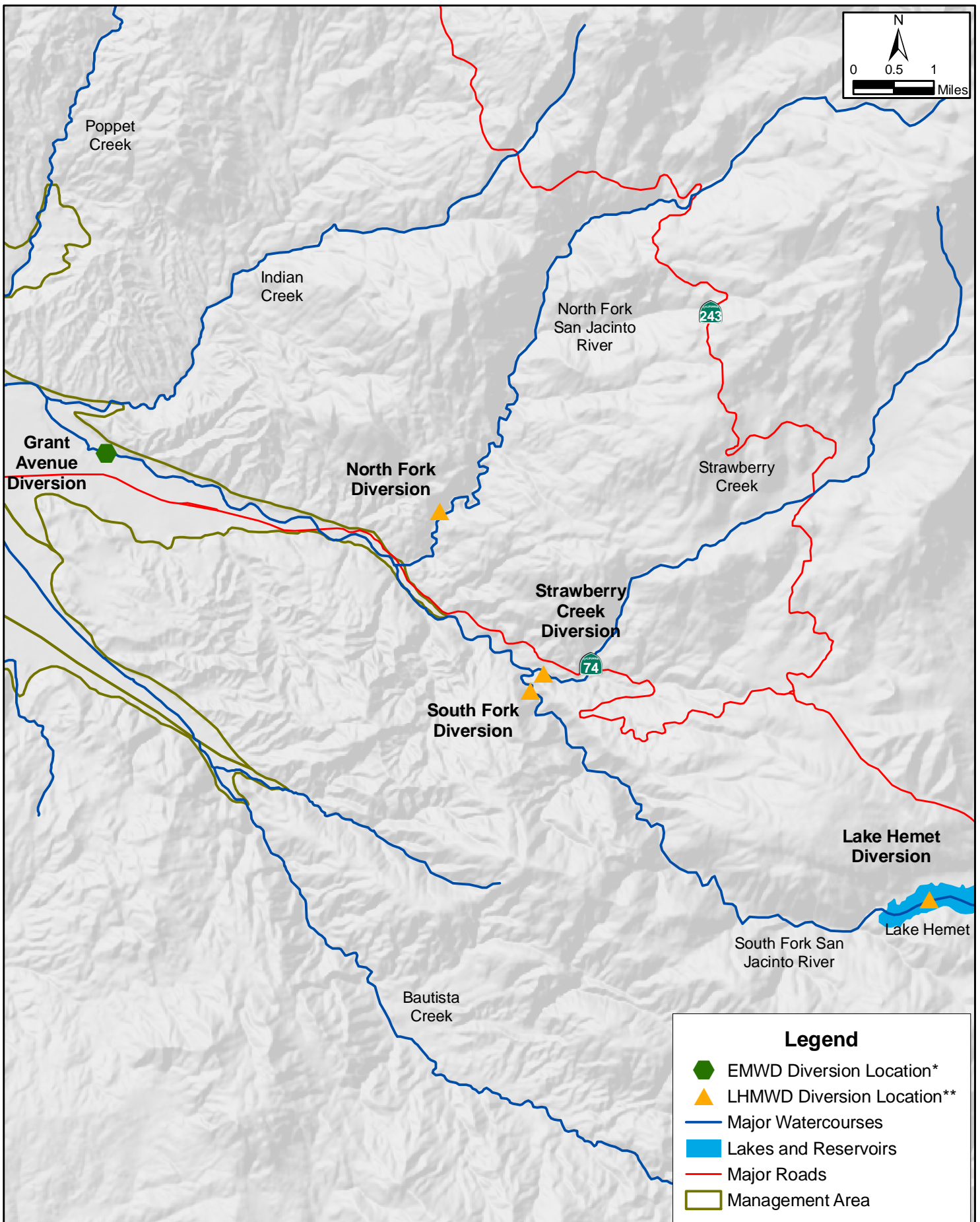
LHMWD holds pre-1914 rights to divert and store water in Lake Hemet, and to divert water from Strawberry Creek, and from the North and South Forks of the San Jacinto River (See Figure 7.1). These rights have been acquired as the successor-in-interest to rights established by the Fairview Land and Water Company, the Lake Hemet Company, the Lake Hemet Water Company, the Florida Water Company, Charles Thomas, H. M. Johnston, E. L. Mayberry, W. F. Whittier, William B. and Mary Webster, and others.

7.1.1 LAKE HEMET

Construction of Lake Hemet Dam began in 1889 and was completed in 1895. The reservoir is located in Township 6S, Range 3E, Sections 7 and 8. Water rights for the diversion and storage of water are based on actual use and upon at least these Notices of Appropriation filed on November 18, 1884 in Book 1 of Water Claims, page 38; on January 19, 1885 in Book 1 of Water Claims, page 47; on December 23, 1885 in Book 1 of Water Claims, page 115; on April 7, 1886 in Book 1 of Water Claims, page 134; and on October 18, 1890 in Book 2 of Water Claims, page 61. The reservoir impounds water from Hurkey Creek and the South Fork of the San Joaquin River, and has a capacity of 12,775 acre-feet. Releases from the reservoir are discharged into the South Fork of the San Jacinto River.

7.1.2 SOUTH FORK OF THE SAN JACINTO RIVER

This diversion site is located about a quarter of a mile upstream of the river's confluence with Strawberry Creek. A wooden diversion dam was originally constructed in 1888, but later replaced with a concrete diversion dam, taking water through a tunnel on the right bank of the stream into a 30-inch pipeline. Water rights are based on actual use and upon at least these Notices of Appropriation filed on June 6, 1885 in Book 1 of Water Claims, page 61; on August 11, 1886 in Book 1 of Water Claims, page 160; and on the Judgment entered



*Source: EMWD
 **Source: LHMWD

November 24, 1894 in the case of Florida Water Company v. Mary Webster, et al., No. 169, Riverside Superior Court.

7.1.3 NORTH FORK OF THE SAN JACINTO RIVER

This diversion site is now located on the North Fork of the San Jacinto River near the “Falls” in Section 17, T5S, R2E. The original facilities consisted of a small rock dam and a 10-inch sheet iron pipe constructed in about 1887. Current facilities, constructed in 1969-1970, consist of a concrete diversion dam, concrete intake and control structure, and 24-inch steel pipeline. Water rights are based on actual use and upon at least these Notices of Appropriation filed on September 14, 1886 in Book 1 of Water Claims, page 173; on May 19, 1897 in Book 1 of Water Claims, page 159; and on the Judgment described above.

7.1.4 STRAWBERRY CREEK

LHMWD’s diversion site on Strawberry Creek is located in Section 28, T5S, R2E, about 1,300 feet upstream of its confluence with the South Fork of the San Jacinto River. Original construction of a concrete diversion dam and flume, carrying the water over the South Fork and into the main water line, occurred in about 1905. Current facilities consist of a concrete diversion dam, intake structure, and 28-inch pipeline. Water rights are based upon actual use and at least on these Notices of Appropriation filed on January 27, 1885 in Book 1 of Water Claims, page 49; on August 11, 1886 in Book 1 of Water Claims, page 160; and on deeds recorded July 24, 1885 in Book 51, page 145; on August 25, 1886 in Book 64, page 223; on February 21, 1887 in Book 73, page 235; on April 21, 1887 in Book 79, page 264; on April 27, 1887 in Book 79, page 266; and on the Judgment described above.

7.2 EMWD’S DIVERSION RIGHTS

EMWD holds a license to divert water from the San Jacinto River (see Appendix G). EMWD currently does not divert surface water for direct use, but recharges the water, when available, into the aquifer to augment groundwater supplies. Thus, the diversion is not directly part of EMWD’s water supply. However, it plays an indirect role in groundwater resources. Information on these diversions is presented here.

EMWD’s recharge of surface water from the San Jacinto River to the Canyon Management Zone takes place at EMWD’s Grant Avenue Ponds in the Valle Vista area (See Figure 7.1). An application for a permit to appropriate water from the San Jacinto River and Indian Creek, Application 924, was filed on February 14, 1918 by the Citizens Water Company. Permit 468

was subsequently approved on August 15, 1918. On November 23, 1920, the filing was assigned to the FMWC as the successor-in-interest to the Citizens Water Company. Upon its 1971 acquisition of the FMWC, EMWD became the successor-in-interest to the filing.

Based on Application 924 and Permit 468, the State Water Resources Control Board issued License No. 10667 for the Diversion and Use of Water to EMWD on June 8, 1976. This license, still held by EMWD, allows for the diversion, underground storage by spreading, and subsequent extraction and beneficial use of 5,760 AFY of San Jacinto River water to be collected from November 1 of each year to June 30 of the succeeding year at a rate of 41 cfs. Additionally, the rate of diversion may be increased to a maximum of 100 cfs provided that the total quantity in any 30-day period does not exceed 2,442 AF.

8.1 ORIGINAL SOBOBA CLAIM

In 1995 the Soboba Tribe filed claims against EMWD and LHMWD for an alleged infringement of their water rights, and for damages in the sum of \$70 million related to the alleged historical interference with the Tribe's rights and the unauthorized use of its water. EMWD and LHMWD denied any such interference or wrongful use of Tribal water, but agreed to negotiations to determine the water rights of the Tribe.

8.1.1 EARLY NEGOTIATIONS

Negotiations with the Tribe began in 1995 and in time involved the active participation of the United States.

8.1.2 UNITED STATES SETTLEMENT PROPOSAL

In 1998, the United States proposed a settlement whereby the Tribal Water Right would be determined to be 9,000 AFY, and the Federal government would provide a supply of 7,500AFY. Subsequently this proposal proved not to be feasible.

8.1.3 TRIBAL CLAIM AGAINST MWD

In 2000 the MWD was brought into the dispute when the Tribe filed suit against MWD in the U.S. District Court in Los Angeles, Case No. 00-04208 (GAF) (MANx) ("Los Angeles case"). The complaint alleged that the MWD tunnel drilled through Mt. San Jacinto in the 1930's had dried up springs on the Reservation and otherwise interfered with the Tribe's water supply.

8.1.4 MWD'S CROSS COMPLAINT

MWD brought EMWD into the Los Angeles action based upon an indemnity agreement signed by EMWD when the District was annexed to MWD, and in return for seepage water that continued to flow into the San Jacinto tunnel.

8.1.5 FINAL NEGOTIATIONS

After lengthy negotiations among the Tribe, United States, EMWD, LHMWD and MWD, the parties reached an Agreement in 2004, subject to approval of Congress.

8.1.6 STATUS OF CONGRESSIONAL APPROVAL

The Agreement has not yet been approved by Congress, and it expires if such approval is not obtained by December 31, 2007.

8.2 FRAMEWORK OF THE SETTLEMENT AGREEMENT

The Agreement determines the water rights of the Tribe, and settles all claims among the parties, including those made in the Los Angeles case. The Agreement will be incorporated into a Stipulated Judgment in the Los Angeles case, and made subject to the continuing jurisdiction of the Court.

8.3 TRIBAL WATER RIGHT

Under the Agreement, the Tribe has a prior and paramount right, superior to all others, to pump 9,000 acre-feet annually from the Canyon Sub-basin and the Intake portion of the Upper Pressure Sub-basin for any use on the Reservation, and on lands now owned or hereafter acquired by the Tribe contiguous to the Reservation or within the above-mentioned Sub-basins. The Tribe's right is subject to an agreement to limit its pumping according to a yearly schedule, with a maximum of 4,100 AFY, for 50 years after the effective date of the Agreement.

8.4 PAYMENTS TO THE TRIBE

The United States agrees to pay \$11 million to the Tribe, and EMWD and LHMWD are obligated to pay \$17 million to the Tribe.

8.5 FUNDS RECEIVED BY THE LOCAL AGENCIES

The United States agrees to contribute to EMWD, on behalf of the participants in this Water Management Plan, the sum of \$10 million for construction and operation of recharge facilities to accommodate deliveries of Imported Water.

8.6 IMPORTED WATER

MWD agrees to provide an average supply of 7,500 AFY of Imported Water to recharge the Canyon Management Zone and Intake portion of the Upper Pressure Management Zone, at untreated replenishment rates, until 2035, and to negotiate in good faith for an extension of the supply for a total of 50 years after the effective date of the Agreement.

8.6.1 MWD STORAGE RIGHT

The local agencies are obligated to provide groundwater recharge facilities to accommodate a flow rate of 42 cfs and to store up to 40,000 acre feet of Imported Water.

8.6.2 USE OF MWD SUPPLY

The supply of Imported Water provided by MWD is to supply water for the Tribe, and to reduce overdraft. Water not used by the Tribe is available for use by the participants in the Water Management Plan, pursuant to the terms hereof.

8.7 WATER QUALITY REQUIREMENTS

The Agreement provides that all water recharged shall conform to all applicable State water quality regulations and recharge in the Canyon Sub-basin and shall not exceed Federal or State primary or secondary drinking water quality standards (except for turbidity, color or coliform bacteria), nor 0.3 mg/l boron, or 0.05 mg/l lithium.

8.8 PROPERTY TRANSACTIONS

EMWD shall convey to the Tribe approximately 106 acres of land at Domenigoni Parkway and Highway 79. MWD shall convey to the Tribe approximately 21.7 acres of land. LHMWD shall make available for environmental mitigation purposes approximately 12 acres in the San Jacinto River bed. The Tribe shall make available up to 98 acres of land for habitat preservation and/or environmental mitigation in connection with the recharge facilities.

8.9 APPROVAL OF WATER MANAGEMENT PLAN

The Agreement provides that EMWD and LHMWD, with the cooperation of other groundwater producers, shall develop and implement a Water Management Plan for the Canyon

Management Zone and Intake portion of the Upper Pressure Management Zone that will address the current overdraft, and recognize and take into account the Tribal Water Right. This Plan is intended to meet such requirements of the Agreement, and is subject to the approval of the Soboba Tribe and the United States. No implementation or subsequent modification of this Plan shall threaten or adversely affect the rights of the Tribe under the Agreement, and the Tribe and the United States shall have the right under the continuing jurisdiction of the Court in the Los Angeles case to litigate any such issue.

9.1 PURPOSE

The purpose of the Watermaster is to implement the Water Management Plan (The Plan) as embodied in the Stipulated Judgment (JUDGMENT) in Eastern Municipal Water District v. Lake Hemet Municipal Water District, et al.; said implementation may be by Watermaster actions alone, actions undertaken through or in conjunction with one or more Public Agency Members or through a Joint Powers Authority (JPA) composed of some or all of its Public Agency Members.

9.2 WATERMASTER**9.2.1 COMPOSITION**

The Watermaster Governing Board will consist of one (1) elected official representing each of the Public Agencies, namely, EMWD, LHMWD, and the Cities of Hemet and San Jacinto (collectively, Public Agencies), and one (1) representative selected by the Class A and Class B private groundwater producers (Private Water Producers).

9.2.2 TERMS OF OFFICE

Each member of the Watermaster shall serve until replaced by the Public Agency or Private Water Producers that made the original appointment.

9.2.3 REMOVAL AND REPLACEMENT

Any Watermaster member may be removed and replaced by the same procedure used in his or her appointment.

9.2.4 VOTING

Each member of the Watermaster shall have one (1) vote. All actions by the Watermaster shall require three (3) affirmative votes, except actions in the following matters that shall require four (4) affirmative votes:

- Any change sought in the form of governance;

- Any change in voting requirements;
- Establishing, levying, increasing or decreasing all assessment amounts;
- Determining the extent of overdraft and quantifying safe yield;
- Determining Adjusted Production Rights;
- Decisions regarding the financing of supplemental water or facilities, other than any financing provisions included in the Judgment;
- Decisions regarding ownership of facilities, other than ownership of the Phase I facilities (described in Section 3.2.2.1), which facilities shall be owned by EMWD, subject to a right of use by those parties participating in the financing thereof;
- Policies for the management of the Management Area;
- Any decision that involves a substantial commitment by the Watermaster, including any contracts for conserved water;
- Retaining the services of legal counsel or Advisor; and
- Adoption or amendment of an annual budget.

9.3 RULES AND REGULATIONS

The Watermaster may make such rules and regulations as may be necessary for the implementation of the Water Management Plan and Judgment, and for its own operations and procedures, subject to Court approval.

9.4 MEETINGS

The meetings of the Watermaster and standing committees will be subject to those provisions of the California Government Code known as the Brown Act (also popularly known as the Open Meeting Laws).

9.5 WATERMASTER ORGANIZATION

In carrying out its development and implementation responsibilities, the Watermaster may hire full-time or part-time personnel, such as managers, engineers, attorneys, hydrologists, geologists, accountants, operators, secretaries, clerical or others; may retain outside consultants on a full-time, part-time, or as-needed basis; and may contract with other agencies to perform some or all of the development and implementation tasks.

The Watermaster shall retain the services of an independent attorney or law firm to act as the Watermaster's legal counsel.

The Watermaster shall retain the services of a qualified independent individual or engineering firm with appropriate experience in hydrology to serve as Advisor to the Watermaster. The Advisor shall assist the Watermaster in the performance of the Watermaster's responsibilities as follows:

- Provide advice to the Watermaster on all matters within the authority and jurisdiction of the Watermaster;
- Provide recommendations for action to the Watermaster on all matters within the authority and jurisdiction of the Watermaster;
- Evaluate proposals for projects and/or recommendations for action received from members of the Watermaster regarding matters within the authority and jurisdiction of the Watermaster;
- Propose and/or evaluate contracts and other agreements to be entered into by the Watermaster necessary to the performance of its responsibilities;
- To administer all contracts and agreements entered into by the Watermaster;
- Assist the Watermaster in evaluating and analyzing data, the collection of which is required under the Judgment and/or Water Management Plan;
- Coordinate the evaluation and analyses of data, proposals, projects, and recommendations by the TC with members of the Watermaster and other consultants of the Watermaster;
- Serve as the Chairman of the TC; and
- Perform such other services, and take such actions, as may be approved by the Watermaster, that are necessary to implement and execute the directions and policies of the Watermaster.

The Watermaster retains the authority to assign or contract the performance of any task or function necessary to consider or perform any matter within the authority and jurisdiction of the Watermaster to any member of the Watermaster, the TC, or any other independent engineering firm or qualified individual. Such assignment or contract shall be coordinated and administered by the Advisor.

As used herein, the term independent means that the Consultant's or Advisor's representation of the Watermaster does not create any actual or potential conflict of interest between the Consultant or Advisor and any other member entity under applicable California statute, regulation, or court decision, or under the common law. Nothing in this definition shall prohibit the Watermaster and affected entity, after appropriate vote, from waiving such conflict in writing.

9.6 GENERAL DUTIES

The general duties of the Watermaster in order to implement the Judgment fall into three categories, as follows:

9.6.1 POLICY

The Watermaster is responsible for the administration of the Judgment and for the development of policies necessary to carry out the implementation of the Water Management Plan, and for additions and modifications thereof.

9.6.2 WATER MANAGEMENT PLAN IMPLEMENTATION

The Watermaster shall implement a water management plan; its responsibilities in that regard include the following:

- Calculating and making determinations regarding the following: (i) safe yield of the Management Area; (ii) each member's share of safe yield; (iii) necessary reductions in each member's Base Production Right to ensure production ultimately equals safe yield; (iv) unused storage capacity which may be used for put and take operations of recycled or imported water; and (v) whether replenishment of exported water is accomplished with an appropriate amount of similar or better quality water.
- Approving projects to be undertaken by the Watermaster in collaboration with member entities as proposed by members of the Watermaster or by the Advisor.
- Providing for the recharge of the Management Area. This includes:
 - (i) implementing a replenishment program for the Management Area;
 - (ii) acquisition of supplemental water supplies (imported, recycled, and Soboba Tribe water); and
 - (iii) providing for the construction and operation of all necessary facilities (including surface and sub-surface percolation and injection facilities).
- Determining the amount of, and levying, billing, and collecting the administrative and replenishment assessments.
- Budgeting and appropriating funds collected by or on behalf of the Watermaster and paying, or authorizing the payment of, costs and expenses of the Watermaster consistent with the Judgment and Water Management Plan.
- Initiating and performing such planning and study activities as may be necessary to implement the Judgment and Water Management Plan, including, but not limited to, preparation of a Watermaster's Annual Report.

- Initiating necessary conservation and drought management measures, and developing water conservation agreements with the Private Water Producers and/or Soboba Tribe for local conservation measures.
- Identifying and participating in the in-lieu replenishment projects.
- Performing all other tasks and taking all other actions as may be necessary to carry out the purpose and intent of the Judgment and the Plan.

9.6.3 TECHNICAL OVERSIGHT

9.6.3.1 Technical Committee Composition

The Stipulated Judgment provides for the operation of a TC, consisting of representatives named in a written designation by EMWD, LHMWD, the Cities of Hemet and San Jacinto, and the Private Water Producers (as one entity). The representative(s) of an entity may be changed by that entity by written notice of the change to the Watermaster.

9.6.3.2 Technical Committee Purpose

The TC will provide such technical assistance as the Watermaster may request and should make recommendations to the Advisor and to the Watermaster on all matters requiring four votes for Watermaster action as outlined in the Voting section above, and on such other matters as requested by the Watermaster. The TC members shall also keep their respective City Councils and Boards of Directors of the Public Agency parties and the Private Water Producers fully informed about the implementation of the Plan.

9.6.3.3 Technical Committee Chairperson

The Advisor will act as the TC's Chairperson and fulfill all the necessary administrative functions required on behalf of the TC.

9.6.3.4 Technical Committee Costs

Costs incurred by individual TC members are the responsibility of the entity appointing that member, and Watermaster funds cannot be used to cover the costs and expenses incurred as a result of the TC activities and functions.

9.7 WATERMASTER INTERACTION WITH EMWD

9.7.1 CONTRACT FOR SERVICES

The Watermaster will contract with EMWD to provide the following services:

- Collection and maintenance of all production, water level, water quality, and other technical data necessary under or required by the Water Management Plan and the transmittal of such data to the Watermaster, its Advisor, and the TC as directed by the Watermaster; the foregoing shall not restrict the Watermaster from entering into other agreements with other members of the Watermaster and/or private firms and individuals for the collection of data.
- Obtaining imported water from MWD or other sources as requested by the Watermaster for replenishment or direct delivery; the foregoing shall not restrict the Watermaster's ability to enter into other agreements with other members of the Watermaster and/or private firms and individuals for the purchase and delivery of imported and/or supplemental water.
- Construct and operate the Phase I facilities (existing EMWD facilities, expansions thereof, and newly constructed facilities) in a manner consistent with the Water Management Plan.
- Perform the accounting functions necessary under the Judgment, i.e., the levy, billing, and collection of all assessments provided for under the Judgment; the payment of costs and expenses of the Watermaster; and related and required accounting and related functions. All funds collected shall be held in a segregated account. All expenses and disbursements shall be separately accounted for. The foregoing shall not restrict the Watermaster from entering into other agreements with other members of the Watermaster and/or private firms and individuals to perform some or all of the accounting functions.

9.7.2 FINANCIAL RESPONSIBILITIES

EMWD will establish restricted accounts and hold all funds collected on behalf of the Watermaster separate from other EMWD funds. All expenditures, encumbrances, and use of funds from these accounts are subject to Watermaster authorization and will be limited to activities related to the Plan. EMWD will transmit periodic reports regarding its financial activities to the Advisor, including annual reporting summarizing the preceding fiscal year financial activities for the approval of the Advisor and the Watermaster.

10.1 ANNUAL BUDGET

The Advisor shall prepare an Annual Budget for review, approval, and adoption by the Watermaster. This Budget shall identify each Public Agency member's financial obligations and assessments and a description of budgeted expenditures, including:

- Replenishment water purchase;
- Operation and maintenance;
- Data collection and evaluation;
- Plan implementation administration;
- Project planning and reporting;
- Billing and assessment collection;
- Capital facilities financial obligations; and
- Preparation of an Annual Audit.

10.2 OWNERSHIP OF FACILITIES

Each Public Agency will continue to own its existing capital facilities for water management. However, in some situations, it may be necessary and/or convenient to form a JPA to finance and build specific capital facilities. Responsibility for the cost of any existing and future capital facilities of the Management Plan should be apportioned among the Public Agencies based on relative benefit to be derived by each Public Agency.

10.2.1 EXISTING FACILITIES

The existing groundwater recharge facilities in the Management Area are owned by EMWD. The Phase I project which is an upgrade of the existing recharge facilities is defined in Section 3.2.2 of this document, and EMWD will own these upgraded facilities. However, the use of the upgraded facilities and the benefits of the low-cost MWD water deliveries through this system will be shared by all agencies based on the level of construction funding contributions for the Phase I facilities and level of participation in the Soboba Settlement financing.

10.2.2 FUTURE PROJECTS

Any of the participating Public Agencies may propose water supply projects to the Watermaster for inclusion in the Plan. Such proposals, after evaluation by the Advisor and the TC, shall be presented to the Watermaster for approval or rejection. 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 Plan and/or interfere with ongoing groundwater production by the Public Agencies.

10.2.3 USE OF MEMBER AGENCY ASSETS

It is the intent of the Member Agencies that their respective facilities shall be used in a manner that facilitates the implementation of the Plan, on terms that are equitable to all parties and consistent with each agency's obligations to its customer base.

10.3 ASSESSMENTS

Public agencies participating in the Plan are subject to two different assessments:

- Administrative Assessment; and
- Replenishment Assessment.

The purpose and use of these assessment funds are described in the following two sections:

10.3.1 ADMINISTRATIVE ASSESSMENTS

Administrative Assessments will be levied on each acre-foot pumped by each Public Agency up to the agency's Adjusted Production Right. These assessments can be used to pay costs associated with:

- Advisor's activities and his/her administrative expenses;
- Billing and assessment collection costs;
- Data collection and evaluation projects;
- Plan implementation administration, including monitoring plan, and associated salaries and overhead; and
- Project planning and reporting expenses.

Initially, the Administrative Assessment shall be Fifty Dollars (\$50.00) per AF, subject to adjustment by the Watermaster.

At the discretion of the Watermaster, any excess funds not used for the above expenditures at the end of the fiscal year can be used to purchase, deliver, and recharge the groundwater within the Management Area. These recharge waters are above and beyond groundwater replenishment waters purchased using the replenishment assessments, and should not be credited to individual Public Agencies as part of their required replenishment obligations. This shall not prohibit the development of a program or plan to provide credits for water purchased above and beyond that needed to satisfy a party's replenishment obligation.

Subject to the Watermaster's approval, funds may also be used to acquire and deliver water for direct use in lieu of pumping.

10.3.2 REPLENISHMENT ASSESSMENTS

Replenishment Assessments will be levied on each acre-foot of water pumped in excess of each Public Agency's or Class B Participant's Adjusted Production Right. Replenishment Assessments will be in amounts equal to the cost of importing or acquiring supplemental water to recharge the Management Area. The component costs will include the cost of the water (including conveyance, transportation and energy costs, operations and maintenance costs, a reserve for replacement and other administrative costs). These assessments will be levied on a per AF of water in excess of each respective member's adjusted Base Production Right. The revenue received for the replacement component shall be placed in a separate reserve fund to be used to fund the replacement cost of the existing system. New and/or expanded facilities will be financed from other resources.

10.3.3 COLLECTIONS AND ACCOUNTS

All the collected assessments and accounts associated with the Plan will be administered by the EMWD and are subject to the policies set by the Watermaster. All payments made to the Watermaster shall be maintained in a separate restricted account established by EMWD, and all accounts shall be subject to annual independent financial audits.

All revenues and assessments shall be used exclusively to acquire supplemental water for the recharge of the management Area and for the facilities and operational and administrative expenses associated with the Plan.

10.4 PHASE I FACILITIES CONSTRUCTION AND SOBOBA SETTLEMENT FINANCING

10.4.1 EMWD CONSTRUCTION COST

The initial facilities, Phase I, shall consist of existing EMWD facilities and expansion and additions to be constructed by EMWD at a cost currently estimated at \$16.12 million less public grants totaling \$5.0 million, for a net cost of \$11.12 million. EMWD shall finance the construction of these facilities through a bond issue or cash payment or by combination thereof. Each Public Agency shall be responsible for pro-rata repayment of the bonds through EMWD or reimbursement to EMWD (to the extent EMWD pays cash for said construction) based on that Agency's Base Production Right allocation percentage, i.e., 34.2% for LHMWD, 33.7% for EMWD, 19.6% for the City of Hemet, and 12.5% for the City of San Jacinto.

10.4.2 PAYMENTS TO SOBOBA TRIBE

In addition to the financing of the construction of Phase I facilities referred to in Section 10.4.1 above, the Soboba Settlement requires the payment of an additional \$17 million to the Soboba Tribe in return for the right to use low cost MWD water delivered for the benefit of the Tribe but which the Tribe does not use and other unused Tribal water. The \$17 million will be financed in the same manner as the construction of the initial Phase I facilities, i.e., by bond issue or cash payment by EMWD or a combination thereof. The \$17 million obligation will be partially offset by a \$10 million contribution by the United States toward the costs of constructing the Phase I facilities. Each Public Agency shall be responsible for pro-rata repayment of the bonds through EMWD or reimbursement to EMWD (for cash payment) based on that Agency's Base Production Right allocation percentage, as set out in Subparagraph (a) above.

10.4.2.1 Water Cost

The payment described above to the Soboba Tribe for the right to use low-cost MWD water delivered for the benefit of the Tribe but not used by the Tribe does not include the price of the water itself, which must be paid to MWD. Each Public Agency shall contractually agree with EMWD to pay its share of MWD's price for such water that it acquires for use to EMWD to enable EMWD to pay MWD.

10.4.3 EMWD OBLIGATION

Agreements between EMWD and each other Public Agency setting forth that Agency's financial commitment as required under Sections 10.4.1 and 10.4.2 (*citation*) above will be required as a condition precedent to EMWD's obligation to finance the facilities construction and the payment to the Tribe so as to establish a dedicated source of revenue for bond repayment or reimbursement, as appropriate. Said agreements shall also provide that, in return for said financial commitment, the Public Agency shall be entitled to: (1) share in the capacity of the Phase I facilities (those in existence and those to be constructed) and (2) share in the rights to the MWD water not used by the Tribe and other unused Tribal water, in each case based on the Agency's Base Production Right allocation percentage, as set out in Subparagraph (a) above. Each agreement with EMWD shall provide for the Agency's method of pro-rata repayment of bonds or reimbursement to EMWD, provided, however, that no Agency will be required to do so by cash payment without its consent.

10.4.4 RIGHT TO TRANSFER ENTITLEMENT TO USE FACILITIES AND/OR ENTITLEMENT TO SHARE IN RIGHTS TO WATER NOT USED BY TRIBE

Each Public Agency shall have the right to sell, lease or otherwise transfer the rights and obligations it holds to use the Phase I facilities described in Section 10.4.1 above and/or to share in the rights to the MWD water not used by the Tribe or other water not used by the Tribe described in Sections 10.4.2 and 10.4.3 above, provided that the transferee thereof shall be bound by said obligations. The foregoing notwithstanding, the Watermaster shall have the right of first refusal regarding any such transfer proposed by a Public Agency.

10.5 FUTURE CAPITAL FACILITIES

Future facilities may be required to meet the growth needs of the Management Area, which may require that a JPA or other financing conduit be formed. In either case, each Public Agency's contribution toward the cost of acquiring the added facilities shall be established by the Watermaster at the time such facilities will be needed. The use of such facilities shall be at the discretion of the Watermaster and be dedicated to replenishment activities. The foregoing shall not affect the right of a Public Agency to undertake a water supply project pursuant to Section 10.4.2 above.

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The five-member Watermaster Governing Board (Watermaster) will be composed of one elected official each from the City of Hemet, City of San Jacinto, LHMWD, and EMWD (Public Agencies) and one representative elected by the private groundwater producers (Private Water Producers). Each member of the Watermaster will have one vote and will serve until replaced by the entity (Public Agencies or the Private Water Producers) making the original appointment.

The Watermaster is responsible for administering and enforcing the provisions of the Stipulated Judgment and any subsequent instructions or orders of the Court. The implementation of the Management Plan, along with any additions or modifications as may from time to time be appropriate, and all financial matters relating to Management Plan Activities are the responsibility of the Watermaster.

This section describes how the Watermaster is expected to implement different elements of the Physical Solution outlined in the Stipulated Judgment. Information provided in this section should be used for planning purposes and is not intended to set or change any conditions imposed by the Stipulated Judgment. The timelines provided in this section should be used as guidelines and are not meant to imply any obligation to be met by the Watermaster. The Watermaster is expected to use the information provided in this section during the early years after its formation and refine, revise, or redefine the information, as it deems appropriate.

11.1 ORGANIZATION

The Watermaster will receive assistance and support from legal counsel, an Advisor, a Technical Committee (TC), and Eastern Municipal Water District (EMWD). The duties and responsibilities of each entity are outlined in subsequent sections. Figure 11.1 demonstrates the relationships between the Watermaster and its supporting entities.

Within one month of the Stipulated Judgment approval, the Private Pumpers identified as Class A and B participants are expected to develop a procedure for electing their representative. The elected officials from the Agencies and the Private Pumpers serving as the Watermaster should be identified within the first two months of Stipulated Judgment approval, and the Watermaster should conduct its first meeting at a mutually acceptable location within one month after that.

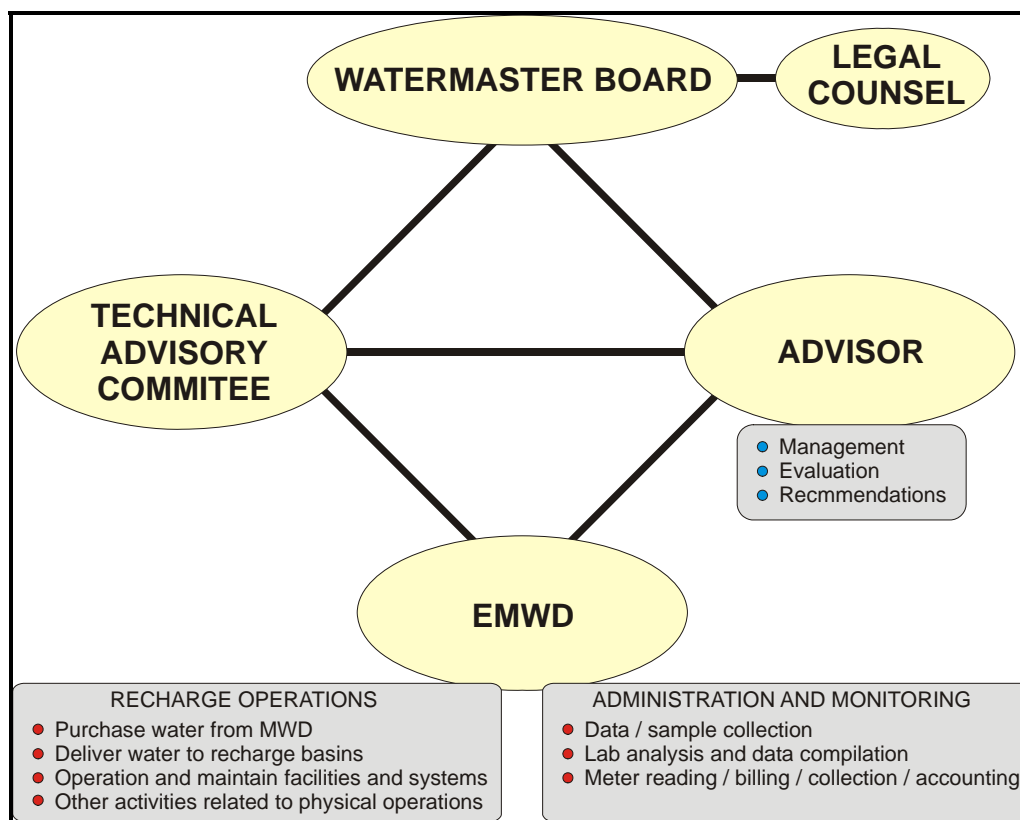


Figure 11.1 Relationships between Entities

Within three months of the Watermaster's first meeting, the Watermaster will retain the services of an independent attorney or legal firm (Legal Counsel) to provide assistance with legal matters and to provide ongoing advice and recommendations in legal areas appropriate to the Watermaster carrying out its duties

Also within three months of the Watermaster's first meeting, the Watermaster will contract with either an independent engineering firm or a qualified individual (Advisor) experienced in hydrology to evaluate and analyze the data collected by EMWD and any conclusions based on that data, and to make recommendations to the Watermaster. The Advisor will provide general coordination between the Watermaster, the Technical Committee, and EMWD with respect to their respective functions, and will also perform such executive functions as the Watermaster may direct. The Watermaster may refer any matter it chooses to any person it may select for assistance in carrying out its duties under the Judgment.

The TC will consist of managerial and technical representatives of the Agencies and Private Water Producers. The Advisor will serve as the TC chairman. The TC will provide technical assistance at the request of the Watermaster. The TC will make recommendations to the Advisor and to the Watermaster on all matters requiring four votes for Watermaster action, which are:

- Any change in the form of governance;
- Any change in voting requirements;
- Retaining the services of legal counsel and Advisor;
- Establishing, levying, increasing or decreasing all assessment amounts;
- Adopting or amending the annual budget;
- Determining the extent of overdraft and quantifying safe yield;
- Determining Adjusted Production Rights;
- Decisions regarding the financing of Supplemental Water or facilities;
- Decisions regarding ownership of facilities, other than ownership of the Phase I facilities, which will be owned by EMWD, subject to a right of use by those parties participating in the Phase I financing;
- Management policies for the Management Area; and
- Any decision that involves a substantial commitment by the Watermaster, including any contracts for conserved water.

In addition, the TC will receive all Monitoring Program and associated data from EMWD for review and evaluation. The TC members are anticipated to keep the City Councils, Agency Boards of Directors, and participating Private Pumpers informed about the Watermaster activities and the Water Management Plan's status.

Within six months of Stipulated Judgment approval, the Watermaster will prepare and adopt Rules and Regulations for its own operation as well as for the operation of the Water Management Plan and Judgment. A dispute resolution process will be included in the Rules and Regulations.

11.2 MONITORING PROGRAM IMPLEMENTATION

The Monitoring Program was initiated with the execution of the September 2003 *Agreement to Develop a Groundwater Monitoring Program in the Hemet/San Jacinto Management Area* between the Cities of Hemet and San Jacinto, EMWD, and LHMWD. Its purpose was to measure and monitor groundwater levels to assist in the accurate evaluation of conditions of overdraft and the evaluation of the operational safe yield in the Management Area. In addition to water levels, the program included water quality and production monitoring. The agreement for 2005 added surface water monitoring of San Jacinto River flows in conjunction with the U.S. Geological Survey. Funded equitably among the agencies, the Monitoring Program has been managed by EMWD. The monitoring locations currently are sampled annually for quality and are measured semi-annual for water levels. The locations are presented in Figure 11.2. These

locations may be updated based on the recommendations in the annual monitoring program as discussed later in this Section.

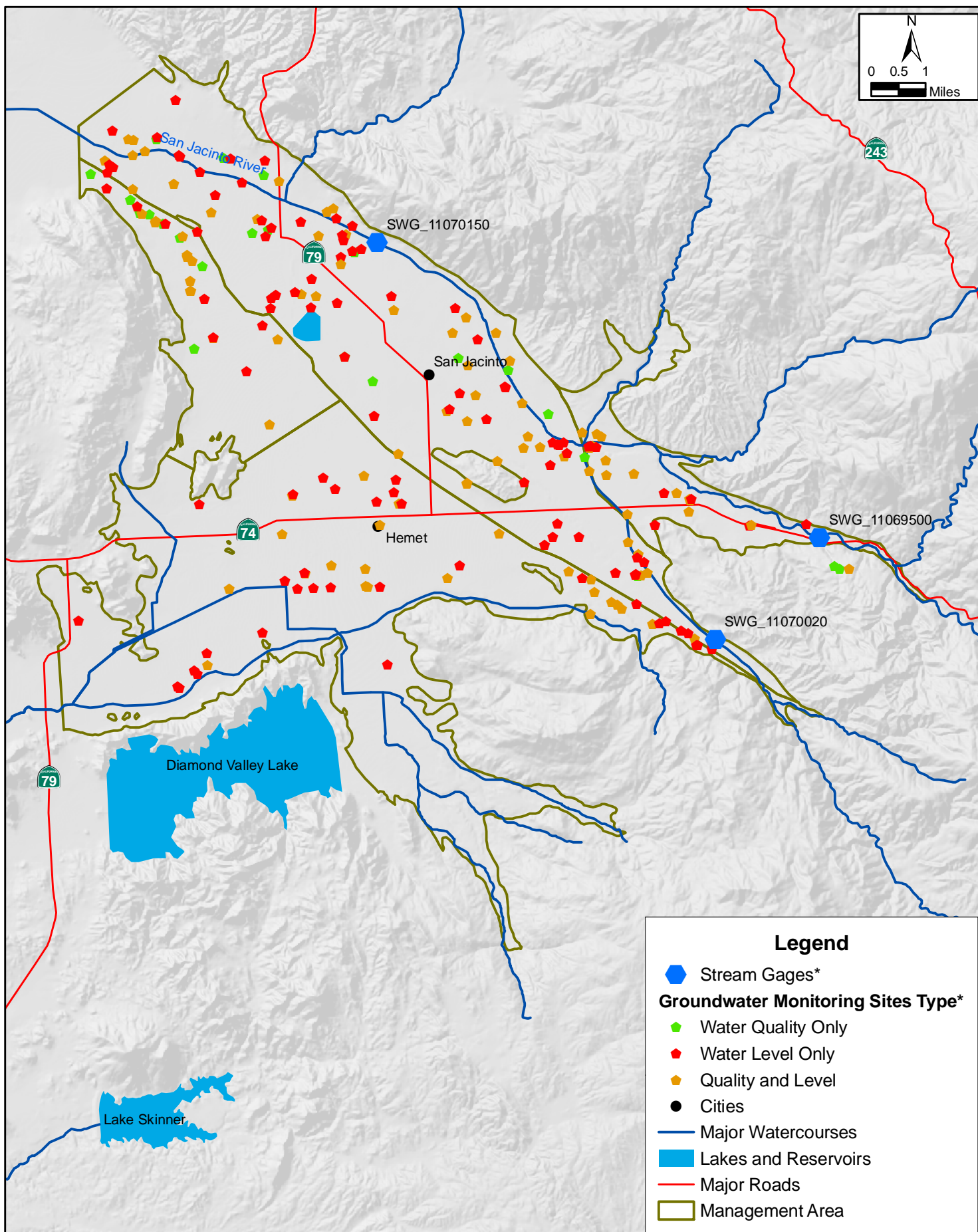
To protect groundwater supplies, an Inactive Well Capping/Sealing Program is included in the Monitoring Programs. Under this program, an inactive well or open casing will be capped/sealed at no charge to the well owner. These wells may still be used for water level and, in some cases, water quality monitoring. 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.

Any Agency or well owner can provide the Watermaster or Monitoring Program personnel with the location of an unused well or open casing for consideration for the Inactive Well Capping/Sealing Program.

Under a contract with the Watermaster, EMWD will lead the Monitoring Program effort. Prior to January 1st of any given year, EMWD staff will present a proposed Monitoring Program to the Advisor. The program is anticipated to include:

1. Estimated number of wells to be monitored for groundwater levels;
2. Estimated number of wells to be sampled for water quality;
3. Number of meters to be read monthly or installed or repaired;
4. Estimated number of inactive wells to be capped;
5. Any changes or variation from the previous year's activities; and
6. Estimated budget to include cost for the field activities and development of the annual report.

The Advisor will review, revise, approve or reject the proposed monitoring program and initiate the annual monitoring program before the end of January of each year. The annual Monitoring Program budget must be approved by the Watermaster before the end of February of each year. The Monitoring Program is run on a calendar year basis and each annual report and associated budget will reflect such a calendar year time period.



Data to be considered for collection and inclusion in the Hemet/San Jacinto Water Management Area Annual Reports to assess the status of the basins and to monitor the responses for future management activities may include, but is not limited to:

- Groundwater level monitoring results;
- Groundwater quality monitoring results;
- Groundwater production;
- Surface water flow monitoring results;
- Surface water quality;
- Surface water diversions;
- Imported water;
- Hydrologic data (rainfall and evaporation);
- Recycled water production;
- Recycled water sales/use;
- Conveyance water;
- Water conservation measures;
- Population growth and development; and
- Land use and crop mix.

EMWD will submit the Annual Hemet/San Jacinto Water Management Area Report resulting from the Monitoring Program to the Advisor for review within four months after completion of each calendar year's monitoring program. The Advisor will then provide the Watermaster with recommendations on how best to operate the Management Area as well as provide a proposed determination of Administrative and Replenishment Assessments for each agency based on previous year's activities. Within the first six years, the Watermaster, with input from its Advisor and the TC, will make a determination of the safe yield of the Management Area. Thereafter, the safe yield shall be reviewed and modified, if necessary, upon the recommendation of the TC or as the Watermaster may determine.

The Watermaster will use information provided in the Annual Hemet/San Jacinto Water Management Area Report and Advisor's recommendations to decide on how to meet the goals for the upcoming year(s).

11.3 MANAGEMENT PLANNING TOOLS

In the future, the Watermaster may want to develop or use databases and other numerical models as planning tools. EMWD maintains a RWRD. Data from the Groundwater and Surface

Water Monitoring Programs, as well as other water and groundwater-related data, are stored in this database. These data form the basis of the Hemet/San Jacinto Water Management Area Annual Reports and can be made available to the Advisor.

EMWD's groundwater flow/transport numerical model can also be made available to assist the Advisor and the Watermaster in evaluating different water resources management alternatives for future projects, for planning purposes, for analysis as in the Regional Water Quality Control Board permitting process, and for determining safe yield. The model is capable of calculating the water budget, exhibiting trends, evaluating regulatory constraints, and can be used as a planning tool. It is recommended that the model be updated every three to five years at the discretion of the Watermaster.

To use EMWD's RWRD and groundwater flow/transport numerical model, the Watermaster is anticipated to enter into a contract with EMWD to cover the Watermaster related cost of software upgrades, necessary hardware, and resources required for maintenance of these tools.

11.4 FINANCIAL ADMINISTRATION

The Watermaster is responsible for the levying, billing, and collection of all assessments provided for under the Judgment, for the payment of all costs and expenses of the Watermaster, and for the performance of accounting and related functions required in connection with performing the Watermaster's duties. The Agencies' groundwater production will be subject to Administrative and Replenishment Assessments. Class B participants are only subject to Replenishment Assessments.

The Watermaster will determine the amount of the Administrative Assessments. For the first year of implementation these assessments are set at \$50 per acre-foot. The amount of the Replenishment Assessments will equal the cost of providing a like quantity of supplemental water to recharge the Management Area. The cost of providing a like quantity of water will include the costs of water, operations and maintenance costs of the replenishment system; capital recovery, and other administrative costs as defined in the Stipulated Judgment. An Administrative Assessment will be levied on each acre foot pumped by an Agency up to its adjusted base production right excluding any adjustments as outlined in the Stipulated Judgment.

In order to obtain operating funds for the Watermaster, the Agencies will advance payment of their share of the Administrative Assessments. These payments are anticipated to be paid within the first quarter of each year. Replenishment Assessments due will be determined on the basis of production during the prior calendar year, and are expected to be paid within the first

quarter of the year following the prior calendar year's production. Replenishment Assessments will be collected prior to actual recharge by the Watermaster.

In addition, the Agencies will be required to make payments as required under other obligations with EMWD, such as, Phase 1 Facilities and Construction Cost and Use, and delivery and use of recycled water agreements.

Starting with the second year, the Watermaster's invoices should reflect the balance of the Administrative and Replenishment Assessment payments from the previous year as a credit or debit on the invoices.

Within three months of Stipulated Judgment approval, the Watermaster is anticipated to contract with EMWD to perform the Watermaster's accounting functions including billing, collection, and accounting. EMWD will maintain a restricted account for such activities as the operation of the Monitoring Programs and purchase of replenishment water. In addition, EMWD will invoice the Watermaster for its share of imported water costs. EMWD's restricted accounts will be included in the Watermaster's year-end audits to be conducted in accordance with accepted accounting principles.

Funding for the monitoring program, development and use of the management planning tools, and the financial management of the accounts are anticipated to come from Administrative Assessments.

All funds collected by EMWD must be held in a segregated account and all expenses and disbursements must be separately accounted for.

11.5 STIPULATED JUDGMENT ADMINISTRATION

The Watermaster shall prepare, file with the Court, and distribute to relevant parties a Watermaster Annual Report including a summary of all activities during the preceding calendar year, an audited statement of all accounts and financial activities of the Watermaster, and a summary of extractions and replenishments as well as all other pertinent information. The Watermaster will provide the Court updated estimates of the groundwater budget, safe yield, and overdraft as required.

During the development of the Water Management Plan, a number of Agreements and MOUs were initiated among and between the Agencies. Within three months of the Stipulated Judgment approval, the Watermaster will review and re-issue the Agreements and MOUs in the name of the Watermaster if necessary and appropriate. The current MOUs are presented in Appendix H.

Upon Settlement Agreement implementation, the Watermaster will recognize the Tribal Water Rights, as set forth in the Stipulated Judgment and the applicable provisions of the Soboba Tribe Settlement Agreement.

11.6 FACILITIES AND PROJECTS

Each 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, municipal bonds, and contributions for storage by The Metropolitan Water District of Southern California or other third parties. Responsibility for the costs of any existing and future capital facility of the Management Plan should be apportioned among the Agencies based on the relative benefit to be derived by each Agency. Any Agency may propose a project 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 a proposal, the proposing 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 Agencies. The maintenance and upgrading of facilities currently owned by any Agency, and used to further the goals of the Management Plan, will be considered by the Watermaster for funding.

The Agencies have been evaluating and developing a number of programs to mitigate overdraft. The stakeholders agreed that the primary project, the core of the Physical Solution, is the IRRP. This project involves the artificial recharge of imported water into the basin along the San Jacinto River. An agreement that documents the ownership, financing, and operation of the facilities for Phase I of the IRRP is anticipated to be executed after completion of the California Environmental Quality Act (CEQA) process.

The Recycled Water In-Lieu Program identifies large agricultural pumpers in the Management Area that can use recycled water as their source of supply instead of producing groundwater. Providing recycled water to these producers will reduce the stress on groundwater resources and will reduce the community's long-term need for imported replenishment water.

The Watermaster, with assistance from the Advisor, TC, and EMWD, will develop recycled water strategies. The operational feasibility of these strategies will be assessed and determined by the Advisor and EMWD. The Advisor will recommend economically feasible projects to the Watermaster for implementation. It is anticipated that EMWD, as the sole recycled water provider in the Management Area will, own, operate and administer facilities required for these projects.

11.7 SPECIAL PROJECTS AND STUDIES

It will be necessary to conduct technical or other investigations such as hydrogeologic investigations, GIS analyses, field investigations, numerical modeling, or feasibility studies. The Watermaster may act individually or participate with other entities to conduct such investigations or to collect data necessary to accomplish the main goals of the Management Plan. In addition, any Agency may propose investigations or studies that are appropriate to the goals of the Management Plan. Such proposals, after review by the Advisor and evaluation by the Watermaster, shall either be accepted or rejected. If the Watermaster rejects a study, the proposing Agency may still implement the investigation or study so long as it does not significantly impact the implementation of the Management Plan or interfere with the ongoing activities by the Agencies.

11.8 CONSERVATION PROGRAMS

Each agency maintains its own individual Conservation Program. Additional conservation measures can be designed and implemented using Best Management Practices by the agencies and/or implemented by the agricultural producers and dairy water users. The Watermaster has the discretion to expand its involvement in local conservation programs and if appropriate, lead any collaborative conservation program amongst the agencies.

11.9 WELL CONSTRUCTION, ABANDONMENT, AND DESTRUCTION

Riverside County regulates the construction, reconstruction, abandonment, and destruction of community water supply wells, individual domestic wells, and agricultural wells. Through the offices of the Department of Environmental Health, the County is responsible for issuing permits for well drilling or abandonment.

Section 10 of the Ordinance No. 682.3 states, “*Standards for the construction, reconstruction, abandonment, or destruction of wells shall be the standards recommended in the Bulletins of the California Department of Water Resources as follows: Bulletin NO 74-81 Chapter II Water Wells, and Bulletin NO 74-90 (Supplement to Bulletin 74-81) and as these Bulletins may be amended by the State of California from time to time.*”

To oversee management of the groundwater resources in the area, the Watermaster is expected to coordinate with the County of Riverside, and track new developments in the area. This will help the Watermaster to identify critical groundwater monitoring wells that are located in areas to be developed. A plan for proper abandonment and/or destruction, and replacement of the well as a monitoring well, if appropriate, will then be set in motion.

If the well is critical in providing data for the Management Area Monitoring Program, the Watermaster will work with the appropriate jurisdictional agency and the well owner to save the well for monitoring or to replace it with a new monitoring well in an area adjacent to a retention basin, park, green belt, or other community area in the vicinity of the original well location.

The Advisor, with the concurrence of the Watermaster, will arrange meetings with the Agencies to discuss and review future construction of any facilities that may be of value or interest to the Management Plan area. The Watermaster will work with the project proponent with regard to enhancing and or modifying the facilities to maximize the benefit to the Management Plan effort.

11.10 PUBLIC PARTICIPATION

The process by which interested and affected individuals, organizations, agencies and government entities are consulted and included in decision making, has been the driving force in the development of the Water Management Plan. Stakeholders in the Hemet/San Jacinto basins have recognized for several years that their groundwater basins are in a state of overdraft. The Soboba Water rights Proposal presented in February of 1995 provided the impetus for the examination of the overdraft problem. The topic of discussion of a public meeting held on December 13, 2000 was the state of the Hemet/San Jacinto groundwater basins.

EMWD sponsored community discussions in early 2001 entitled: "Groundwater Management: Avoiding Political Pitfalls", "State of the Hemet/San Jacinto Basins", and "Cooperate to Self-govern". The Principles for Water Management were drafted as the basis for a starting point to develop solutions, both for the Soboba proposal and for the overdrafted basin. The Principles were circulated to the general public in February 2001.

In June, 2001, EMWD, LHMWD, City of Hemet and City of San Jacinto signed a conjunctive management Memorandum of Understanding (MOU) with DWR. Two committees were organized to work cooperatively to address the issues. The policy committee, comprised of elected officials and staff members of the four agencies, plus local private pumpers, and a technical advisory committee with representatives from the four agencies, the private pumpers and a neutral consultant provide by DWR. The policy committee meetings are open to the public and are frequently attended by agricultural pumpers, local business owners, local residents, and tribal members, attorneys and technical consultants of the Soboba Band of Luiseño Indians.

Water Outreach Public Information Programs hosted by EMWD have been held at a local restaurant in Hemet in October 2001 and August 2002 to discuss the progress of the Groundwater and Technical Committees in the development of a Water Management Plan.

The Watermaster will continue this process of public involvement and community outreach during Management Plan implementation. Meetings of the Watermaster will be public meetings and will, therefore, be subject to the Brown Act.

11.11 GROUNDWATER MANAGEMENT PLAN COMPONENTS AND CONSISTENCY WITH THE CALIFORNIA WATER CODE

Groundwater management is the planned and coordinated local effort of sustaining the groundwater basin to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating groundwater management plans (California Water Code, Sections 10750 et seq.). AB 3030 also encourages coordination between local entities through joint-power authorities or MOUs. SB 1938, passed in 2002, further emphasized the need for groundwater management in California. SB 1938 requires AB 3030 groundwater management plans to contain specific plan components to receive state funding for water projects.

The Water Management Plan includes the seven mandatory components that are required to be eligible for the award of certain funds administered by DWR for the construction of groundwater projects or groundwater quality projects. The Plan also addresses the 12 specific technical issues identified in the California Water Code along with the seven recommended components identified in DWR Bulletin 118 (DWR 2003). Appendix I lists the required and recommended components and identifies the specific location within this Plan where the information can be found.

11.12 SCHEDULE

The Plan Implementation Schedule is shown in Table 11.1.

Phase I of the Integrated Recharge and Recovery Program is scheduled to be constructed in two phases, Phase A and Phase B. The schedule for activities related to these phases is shown in Table 11.2.

Table 11.1 Plan Implementation Schedule

Task No.	Description	Time Required	Estimated Completion
1	Retain Services of Legal Counsel	3 Mos.	Within 6 mos. of Stipulated Judgment Approval (S.J.A.)
2	Retain Services of Advisor	3 Mos.	
3	Review and Re-issue Existing Agreements and MOUs in the Name of the Watermaster if Appropriate and/or Necessary	3 Mos.	
4.	Watermaster Enter into Contract(s) with EMWD to: a) Manage/administer the Groundwater and Surface Water Monitoring Programs and prepare the <i>Hemet/San Jacinto Water Management Plan Annual Report</i> containing Monitoring Program results and related information; b) Compile all data and maintain the Regional Water Resources Database; c) Operate, maintain, and update the Groundwater Model. d) Provide Accounting Functions. e) Manage Recharge Facilities and any Other Field Operations.	3 Mos.	
6	First Watermaster Annual Report to the Court	3 Mos.	Within 14 mos. of S.J.A.
7	Develop and Adopt Rules and Regulations	3 Mos.	Within 6 mos. of S.J.A.
8	Administrative Assessment Payment	1 st Quarter of Each Year	On-going
9	Replenishment Assessment Payment	1 st Quarter of Each Year Following the Actual Production	On-going

Table 11.2 Phase I Project Construction

Task No.	Description	Time Required	Estimated Completion
PHASE A			
1	Environmental Process (EIR)	---	Completed
2	Land Acquisition		Within 6 mos. of Settlement Agreement Approval (S.A.A.)
3	Grant Approval, Advertising, Award	7 Mos.	
4	Extraction Well Drilling	17 Mos.	
5	Extraction Well Pump & Chlorination Equipping	12 Mos.	
6	Pump Station Modifications	12 Mos.	
PHASE B			
1	NEPA/Permitting Process	---	Before S.A.A.
2	Extraction Well Drilling	6 Mos.	Within 12 mos. of S.A.A.
3	Extraction Well Pump & Chlorination Equipping	19 Mos.	
4	Recharge Basins	5 Mos.	
5	Pipelines	5 Mos.	
6	Monitoring Wells	6 Mos.	

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SOBOBA BAND OF LUISEÑO INDIANS
SETTLEMENT AGREEMENT

THIS SETTLEMENT AGREEMENT is entered into by the Soboba Band of Luiseño Indians on behalf of itself and its members (collectively, the “Soboba Tribe”); the United States of America solely in its capacity as trustee for the Soboba Tribe (the “United States”); the Eastern Municipal Water District (“EMWD”); the Lake Hemet Municipal Water District (“LHMWD”); and The Metropolitan Water District of Southern California (“MWD”).

ARTICLE 1- RECITALS

1.1 The Soboba Tribe has made claims against EMWD and LHMWD (collectively, the “Local Districts”) for alleged infringement of its water rights in the San Jacinto River (“River”) and the Canyon Sub-basin and the Intake portion of the Upper Pressure Sub-basin associated therewith (collectively “Basin”) in Riverside County, California, and for damages related to historical interference with the Soboba Tribe’s rights and the unauthorized use of its water. Specifically, the Soboba Tribe alleges that the Local Districts, through their longstanding diversion of waters from the River and pumping of Groundwater from the Basin, have interfered with the Soboba Tribe’s water resources and its rights to the beneficial use and enjoyment of the Reservation.

1.2 The Soboba Tribe also has filed a lawsuit against MWD styled *Soboba Band of Luiseño Indians v. Metropolitan Water District of Southern California*, United States District Court Case No. 00-04208 GAF (MANx) (the “Action”). The Action alleges that MWD, by the construction and operation of the San Jacinto Tunnel (the “Tunnel”), has interfered with the Soboba Tribe’s water resources and its rights to the beneficial use and enjoyment of the Reservation.

1.3 The Parties have agreed to settle the Soboba Tribe’s claims on the terms set forth in this Settlement Agreement.

1.4 MWD also contends that it has legal indemnification claims and other rights against EMWD for the Action arising out of MWD Board Resolution 3940 (EMWD's Terms of Annexation into MWD). In 1951, EMWD was created and annexed into MWD for the purposes of resolving claims that MWD's construction and operation of the Tunnel interfered with local water rights in the Basin and to obtain a supplemental supply of water for the area. The Terms of Annexation required EMWD to resolve potentially conflicting rights to the Tunnel seepage water and that MWD annually credit EMWD for the entire amount of Tunnel seepage, which MWD has done every year since 1951. In exchange for the benefits of being annexed into the MWD service area and the return of the Tunnel seepage water to EMWD, EMWD was required to defend and indemnify Metropolitan from certain claims seeking recovery for loss or injury as a consequence of the Tunnel seepage, specifically including claims brought by the Tribe. In response to the Tribe's Action, MWD tendered the defense and indemnity of the Tribe's claims to EMWD, which EMWD declined on the grounds that the Action allegedly exceeded the scope of its obligations under the Terms of Annexation. MWD subsequently filed a third party action against EMWD seeking to enforce the defense and indemnity provisions contained in the Terms of Annexation. EMWD and MWD dispute each other's contentions.

1.5 EMWD and MWD have agreed as part of this settlement to resolve their dispute over the scope of EMWD's defense and indemnity obligations to MWD reflected in the EMWD's Terms of Annexation.

NOW, THEREFORE, in consideration of the promises and agreements hereinafter set forth, the Parties agree as follows:

ARTICLE 2 - DEFINITIONS

This Settlement Agreement employs abbreviated terms that have the meanings below. To the extent that the definitions below conflict with those terms defined in other sections of the Settlement Agreement, the definitions in Article 2 shall prevail.

2.1 "Act" unless otherwise indicated, shall mean the Soboba Settlement Act approving this Settlement Agreement, attached as Exhibit A.

2.2 “Action” means the Soboba Tribe’s lawsuit against MWD styled Soboba Band of Luiseño Indians v. Metropolitan Water District of Southern California, United States District Court Case No. 00-04208 GAF (MANx) and includes MWD’s third party claim against EMWD.

2.3 “AFA” means acre-foot of water per annum.

2.4 “Basin” means collectively the Canyon Sub-basin and the Intake portion of the Upper Pressure Sub-basin as depicted on Exhibit B (map) and described in Exhibit C.

2.5 “Best Efforts” means that the Districts will take all commercially reasonable actions to fulfill the referenced contractual obligation.

2.6 “Canyon Sub-basin” means the groundwater basin as depicted on Exhibit B (map) and described in Exhibit C.

2.7 “Court” shall mean the Federal District Court for the Central District of California, Central Division, which has exercised jurisdiction over the Action.

2.8 “Decree Court” means the court with jurisdiction over the judgment and decree entered in accordance with this Settlement Agreement.

2.9 “Districts” means EMWD, LHMWD, and MWD.

2.10 “Effective Date” means the date on which the Secretary causes to be published in the Federal Register a statement of findings that the conditions in Section 3.1 have been fulfilled.

2.11 “EMWD” means the Eastern Municipal Water District.

2.12 “Groundwater” for the purposes of this Settlement Agreement means all water beneath the surface of the earth.

2.13 “Imported Water” means water sold by MWD to EMWD pursuant to Section 4.4 and is not intended to have the same meaning as the term “Imported Water” is used in MWD’s Administrative Code.

2.14 “Intake Sub-basin” means the portion of the Upper Pressure groundwater Sub-basin as depicted on Exhibit B (map) and described in Exhibit C.

2.15 “LHMWD” means the Lake Hemet Municipal Water District.

2.16 "Local Districts" means EMWD and LHMWD.

2.17 "MWD" means The Metropolitan Water District of Southern California.

2.18 "Party" is the singular form of "Parties," which means the entities represented by the signatories to this Settlement Agreement.

2.19 "Recharge Facilities" means those facilities to be constructed by the Local Districts pursuant to Section 4.4.G of this Settlement Agreement for the purpose of recharging the Imported Water into the Basin.

2.20 "Reservation" means the Soboba Indian Reservation as depicted on Exhibit D (map), comprising approximately 5,935 acres, as established by Executive Order on June 19, 1883; thereafter expanded by Executive Orders on January 29, 1887, and December 29, 1891, the purchase of 709.65 acres known as "Tract 8" in 1911, the issuance of a trust patent for 68.9 acres in 1913, and the transfer of 880 acres pursuant to the Southern California Indian Land Transfer Act, Pub. L. No. 100-581, 102 Stat. 2946 (1988); and, thereafter modified by Executive Orders of March 22, 1886, and January 29, 1887, and the issuance of a fee patent for 32.84 acres in 1900. It does not include the 950 acres northwest of and contiguous to the Reservation known as the "Jones Ranch," purchased by the Soboba Tribe in fee on July 21, 2001, and placed into trust on January 13, 2003, nor the 278.49 acres southeast of and contiguous to the Reservation known as the "Greater Horseshoe," purchased by the Soboba Tribe in fee in five separate transactions in June and December 2001 and December 2004; nor the 478 acres north of and contiguous to the Reservation known as "Kwiili," purchased by the Soboba Tribe in fee on April 4, 2004.

2.21 "River" means the surface flow of the San Jacinto River and its tributaries from its origins in the San Jacinto Mountains into and across the Basin as shown on Exhibit B (map).

2.22 "Secretary" means the Secretary of the Interior or her designee.

2.23 "Settlement Agreement" means this document including all exhibits, which are incorporated by reference.

2.24 “Soboba Tribe” means the Soboba Band of Luiseño Indians, a body politic and federally recognized Indian tribe, and its individual members.

2.25 “Surface Water” means all surface water flows of the River.

2.26 “Terms of Annexation” means Metropolitan Resolution No. 3940 which sets forth the terms of EMWD’s annexation to MWD.

2.27 “Tribal Water Right” means the Soboba Tribe’s rights to water set forth in Section 4.1.

2.28 “Tunnel” means that portion of the Colorado River Aqueduct known as the San Jacinto Tunnel.

2.29 “United States,” unless otherwise indicated, means the United States of America solely in its capacity as trustee on behalf of the Soboba Tribe or its members.

2.30 “Untreated Replenishment Water” means untreated water sold pursuant to the Replenishment Service program as defined by MWD’s Administrative Code at sections 4104, 4114 and 4514.

2.31 “Upper Pressure Sub-basin” means the groundwater basin as depicted on Exhibit B (map).

2.32 “WMP” means the Water Management Plan that will be developed by EMWD, LHMWD, the City of Hemet, the City of San Jacinto and other Basin users, pursuant to Section 4.8.A of this Settlement Agreement, to manage the Canyon Sub-basin, the Upper Pressure Sub-basin downstream to Bridge Street, and the Hemet Basins. The principles of the Water Management Plan are attached as Exhibit E. The area covered by the Water Management Plan is depicted on Exhibit F (map) and described in Exhibit G.

ARTICLE 3 – CONDITIONS PRECEDENT AND ENFORCEMENT

3.1 This Settlement Agreement shall become enforceable, and the releases and waivers of Article 5 effective, as of the date the Secretary causes to be published in the Federal Register a statement of findings that the following conditions have been fulfilled:

A. the Act has been enacted;

B. to the extent that the Settlement Agreement conflicts with the Act, the Settlement Agreement has been revised to conform with the Act;

C. the Settlement Agreement, as so revised, and the Waivers and Releases have been executed by the Parties and the Secretary;

D. warranty deeds for the property to be conveyed in fee to the Soboba Tribe pursuant to Section 4.6 have been placed in escrow with instructions that they shall be delivered to the Soboba Tribe by close of business on the first business day following the date that all of the conditions in this paragraph have been fulfilled;

E. the Soboba Tribe and the United States have approved the WMP;

F. the Judgment and Decree attached to the Settlement Agreement as Exhibit H have been approved by the United States District Court, Eastern Division of the Central District of California, and that judgment and decree have become final and nonappealable; and

G. the Congress of the United States has appropriated the funds and the funds have been deposited in the appropriate accounts pursuant to Sections 4.5 and 4.7.

3.2 Other than to take all necessary steps to cause the events described in this Article to occur, no Party shall be required to perform any of the obligations, or be entitled to any of the benefits, under this Settlement Agreement before all conditions precedent have been fulfilled. After the fulfillment of all conditions precedent, the Parties shall be bound by all provisions of this Settlement Agreement.

3.3 If all of the conditions listed in Section 3.1 have not been fulfilled by December 31, 2007, this Settlement Agreement shall be null and void, and any consideration, together with any income earned thereon, shall be returned to the depositing entity.

ARTICLE 4 - TRIBAL WATER RIGHTS

4.1 Water Rights. The Parties ratify, confirm, declare to be valid and agree not to object to or dispute or challenge in any judicial or administrative proceedings the rights of the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe, to the water rights set forth in this Section. In so doing, the Parties acknowledge that these rights are

the result of bargained for and exchanged concessions, as a result of which the Local Districts have agreed to supply water to the Soboba Tribe if it is unable, except for mechanical failure of its wells, pumps or water facilities, to produce the water to which it is entitled under this Article. Therefore, the Soboba Tribe shall have the following water rights which shall be held in trust by the United States for the benefit of the Soboba Tribe:

A. The prior and paramount right, superior to all others, to pump 9,000 AFA from the Basin for any use on the Reservation and lands now owned or hereafter acquired by the Soboba Tribe contiguous to the Reservation or within the Basin.

B. The Soboba Tribe's right to pump a total of 9,000 AFA from the Basin is without regard to whether the water was naturally or artificially recharged.

C. In the event the Soboba Tribe is unable, except for mechanical failure of its wells, pumps or water facilities, to produce from its existing wells or equivalent replacements up to 3,000 AFA production from the Canyon Sub-basin and the remainder of its Tribal Water Right from the Intake Sub-basin, subject to Section 4.3.A, the Local Districts shall deliver any shortage to the Soboba Tribe. Any shortage shall be delivered at such locations as the Soboba Tribe and the Local Districts may agree, or if there is no agreement, at the wellheads where the shortage occurred. Such water may be supplied from Local District wells in either the Canyon or Intake Sub-basins, or from other sources. For any water delivered pursuant to this paragraph, the Soboba Tribe shall pay an acre-foot charge equal to its then current cost of production, and any avoided cost of treatment, from the wells where the shortage occurred, assuming pumping lifts equal to the Soboba Tribe's averages in the respective Sub-basins over the preceding ten years.

4.2 Water Quality. Recharged water placed in the Canyon Sub-basin by Local Districts and/or the WMP and any replacement water delivered to the Soboba Tribe pursuant to Section 4.3.C shall conform to all applicable State water quality regulations and, without prior written approval from the Soboba Tribe, shall neither exceed (1) any Federal or State of California primary or secondary drinking water standards (except with respect to recharged water, turbidity, color, or coliform bacteria) nor (2) 0.3 milligrams per liter (mg/l) boron or 0.05

mg/l lithium. Recharged water placed in the Intake Sub-basin by EMWD, LHMWD, and/or the WMP shall conform to all applicable State water quality regulations. Nothing in this paragraph shall affect the water quality obligations assumed by Metropolitan for Imported Water set forth in Section 4.4.

4.3 Soboba Tribe's Water Use. Beginning on the Effective Date, the Soboba Tribe's right to pump groundwater in the exercise of its Tribal Water Right shall be subject to the following provisions:

A. The Soboba Tribe agrees to limit its exercise of the Tribal Water Right to 4,100 AFA for a period of fifty (50) years commencing with the Effective Date, according to the schedule set forth in Exhibit I to this Settlement Agreement. Should the Soboba Tribe during that period identify a need for water in addition to the Schedule set forth in Exhibit J, the Soboba Tribe shall have the right to purchase water from the WMP at the rate then being charged to the WMP's municipal producers.

B. Any use of the Tribal Water Right by an individual member of the Soboba Tribe shall be satisfied out of the water resources provided to the Soboba Tribe in this Settlement Agreement.

C. In addition to the limitation in Section 4.3.A, the Soboba Tribe may enter into contracts and options to lease, contracts and options to exchange, or contracts and options to forbear the use of the Tribal Water Right or postpone undertaking new or expanded water uses, provided that any such contract or option for a term greater than five years shall require the approval of the Secretary. Any such water thereby made available to others shall only be used by participants in, or other users within the area of, the WMP. No contract shall be for a term exceeding one hundred (100) years, nor shall any contract provide for permanent alienation of any portion of the Tribal Water Right.

4.4 Purchase of Imported Water [see definition of Imported Water in Section 2.13 of this Settlement Agreement]. In order to provide water to the Soboba Tribe and to reduce the overdraft of the Basin, EMWD and MWD agree to enter into a contract pursuant to which MWD

will sell and EMWD on behalf of the WMP will purchase the Imported Water under the following terms:

A. Price. The Imported Water will be sold by MWD to EMWD at the then prevailing service rate charged by MWD for Untreated Replenishment Water, which rate is reflected in MWD's Administrative Code at section 4401(a)(2). As of the date this Settlement Agreement is signed by MWD, the service rate for such water is \$233 per acre foot. Changes in the rates charged for Imported Water shall be effective the same date that the new rates for Untreated Replenishment Water become applicable to MWD's member agencies. Should MWD ever discontinue the delivery of Untreated Replenishment Water, the service rate for water supplied pursuant to this contract shall initially be determined by taking the last published service rate for Untreated Replenishment Water and charged to EMWD under this contract. Thereafter, the rate for Imported Water would continue to be adjusted on the same percentage basis as MWD's service rate for the non-interruptible untreated water deliveries to its member agencies, which adjustments shall become effective on the same date that the new service rates become applicable to MWD's member agencies.

B. Use. For purposes of the Imported Water only, MWD releases EMWD from all covenants that now, or may in the future, require that water purchased at the service rate for Untreated Replenishment Water be left in the ground or otherwise not used for any period of time.

C. Duration. The contract shall commence upon the Effective Date and will expire on December 31, 2035. EMWD and MWD agree to negotiate in good faith a possible extension of this water sale contract for an additional period which, when added to the original term expiring on December 31, 2035, would provide for a total term of 50 years. In determining whether or not to extend the term of this contract for this additional period, MWD will consider the current status of its replenishment water program, the status of MWD's State Water Project contract, the implementation of this Settlement Agreement, and any other information that MWD deems relevant to the possible extension of the water sale contract. Nothing in this paragraph

shall be construed to require MWD to extend the water sale contract.

D. Water Quality. Water sold by MWD pursuant to this contract shall be of a quality that is consistent with MWD's operational and water quality goals. MWD agrees to make Best Efforts to meet water quality objectives set by the Santa Ana Regional Water Quality Control Board for recharged water being put into the Basin. MWD takes no risks associated with any discrepancy between the water quality obligations assumed by MWD pursuant to this paragraph and water quality standards applicable to recharged water set by the Santa Ana Regional Water Quality Control Board or other regulatory body.

E. Deliveries. Deliveries under this contract shall not begin until the Effective Date. Once deliveries are commenced, MWD shall use Best Efforts to deliver 7,500 AFA for the duration of the contract based upon 15-year averages. Annual deliveries shall be calculated on a January 1 to December 31 calendar year and shall be pro rated for any portion of a year during which the contract is in force. MWD reserves the right to deliver water at any time of the year. MWD shall give EMWD advance notice of Imported Water deliveries as provided for in MWD's then current Administrative Code and implementing guidelines for replenishment water deliveries, which presently is reflected in section 4514(c) of MWD's Administrative Code.

F. Point of Delivery. Deliveries shall be made by MWD to EMWD at the connection known as EM-14 or, upon mutual agreement of MWD and EMWD, at one or more additional existing or future connections. The Parties acknowledge that the suspension or termination of deliveries to EM-14 may, at any time, as determined by MWD's Chief Executive Officer, be required to meet MWD's operational needs. If deliveries to this location are suspended or terminated, then EMWD and MWD agree to negotiate in good faith to identify an alternative delivery point or points and, if MWD and EMWD are unable to reach agreement, the dispute shall be resolved by the Decree Court.

G. Recharge Facilities. The Local Districts, through the WMP, shall construct, operate, and maintain facilities for artificial Groundwater recharge and banking of the Imported Water. Said facilities shall be sufficient to accommodate a flow rate of 42 cubic feet per second

and to store up to 40,000 acre feet of Imported Water in the Basin. MWD shall have a paramount right to use capacity in the Recharge Facilities sufficient to accommodate a flow rate of 42 cubic feet per second and a paramount right to store up to 40,000 acre feet of Imported Water to meet its obligations under this Settlement Agreement, provided that MWD's sole remedy if the required storage capacity is not made available is to reduce its obligation by the amount of water that it was prepared but unable to deliver due to the lack of storage capacity. MWD's obligations under this Section 4.4 shall not arise until the Recharge Facilities are capable of meeting the capacity and storage requirements set forth in this paragraph.

H. Postponed Deliveries. EMWD shall have the right to postpone deliveries during periods when the Recharge Facilities are not capable of meeting the capacity and storage requirements set forth in Section 4.4.G, provided that each of the following four conditions are met: (i) the inability to meet capacity and storage requirements is the result of events beyond the control of the Local Districts and/or the WMP; (ii) the inability to meet capacity and storage requirements is not the result of negligence on the part of the Local Districts and/or the WMP; (iii) the inability to meet capacity and storage requirements is not the result of water quality limitations that are more restrictive than those established pursuant to Section 4.4.D, and (iv) that the Local Districts use Best Efforts to make necessary repairs and/or take other actions necessary to make the Recharge Facilities fully operational.

(1) If the conditions for postponed deliveries are met as required herein, MWD shall make up such deferred deliveries at a later time, to the extent that MWD has Untreated Replenishment Water available.

(2) If the conditions for postponed deliveries are not met as required herein, then MWD's obligation to deliver water shall be reduced by the amount of water that MWD was prepared to deliver, subject to the 42 cubic feet per second maximum flow rate, and the existence of unused storage capacity up to the 40,000 acre-foot maximum.

I. Pre-Deliveries. MWD shall have complete discretion concerning use of the 40,000 acre feet of storage capacity for the pre-delivery of Imported Water, including the right

not to use such capacity. As such, MWD makes no commitments to pre-deliver any amount of Imported Water.

4.5 Funding for Infrastructure. In accordance with the Act, the United States shall establish in the Treasury of the United States a fund in the amount of \$10,000,000, managed by the Secretary of the Interior, which may be drawn upon by EMWD to pay or reimburse costs associated with constructing, operating, and maintaining that portion of the Recharge Facilities necessary to accommodate deliveries of the Imported Water.

4.6 Land Transfer.

A. EMWD Property. In settlement of the Action, EMWD shall place into escrow a warranty deed conveying to the Soboba Tribe in fee all of the property presently owned by EMWD at Domenigoni Parkway and Highway 79, consisting of approximately 106 acres which is described and illustrated in Exhibit J to this Settlement Agreement. The escrow instructions shall provide that the warranty deed shall be delivered to the Soboba Tribe by close of business on the first business day following the Effective Date.

B. MWD Property. In settlement of the Action, MWD shall place into escrow a warranty deed conveying to the Soboba Tribe in fee property presently owned by MWD at Domenigoni Parkway and Patterson Avenue, consisting of approximately 21.7 acres which is described and illustrated in Exhibit K to this Settlement Agreement. The escrow instructions shall provide that the warranty deed shall be delivered to the Soboba Tribe by close of business on the first business day following the Effective Date.

C. The Secretary shall accept into trust for the benefit of the Tribe the lands conveyed to the Tribe pursuant to this Section.

D. Use of Property. Management and development by the Soboba Tribe of the lands transferred by this paragraph shall comply with all applicable Federal law. Any regulation by the Soboba Tribe of the environment on, under or above such lands that impacts MWD's operations, including but not limited to its operations related to Diamond Valley Reservoir, shall be consistent with, and no more stringent than, comparable regulation by the United States and the

State of California.

4.7 Development Funds.

A. Local Districts. No later than 120 days after the Effective Date and before any funds are released to the Local Districts under Section 4.5, the Local Districts shall pay to the Soboba Tribe the sum of \$17,000,000 plus interest at the average daily prime rate (as reported by the Wall Street Journal) plus two and one-quarter percent (2.25%) per annum from the Effective Date until paid. These funds are determined to be non-trust funds and shall be managed by the Soboba Tribe in its sole discretion. The United States shall have no responsibility with respect to the funds provided to the Soboba Tribe pursuant to this paragraph.

B. United States. In accordance with the Act, the United States shall establish in the Treasury of the United States a trust fund in the amount of \$11,000,000, managed by the Secretary of the Interior in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 et seq.) and this Settlement Agreement. There shall be no expenditures from the trust fund until the conditions in Section 3.1 are fulfilled.

(1) Investment of the Fund. The Secretary shall invest amounts in this fund in accordance with the Act of April 1, 1880 (21 Stat. 70, ch. 41, 25 U.S.C. 161), the first section of the Act of June 24, 1938 (52 Stat. 1037, ch. 648, 25 U.S.C. 162a), and this paragraph.

(2) Fund Uses. This fund may be drawn upon by the Soboba Tribe with the approval of the Secretary to pay or reimburse costs associated with constructing, operating, and maintaining water and sewage infrastructure or other water-related development projects.

4.8 Other Terms.

A. The Local Districts, with the cooperation of other Groundwater producers in the Basin, shall develop and implement a WMP for the Basin that will address the current Basin overdraft, and recognize and take into account the Tribal Water Right. The WMP shall not be final or deemed effective for the purposes of this Settlement until it is approved by the Soboba Tribe and the United States. No implementation or subsequent modification of the WMP shall threaten or adversely affect the rights of the Soboba Tribe hereunder, and the Soboba Tribe and

the United States reserve the right under the continuing jurisdiction of the Decree Court to litigate any such issue.

B. EMWD will credit to the Soboba Tribe the sum of \$1,000,000 to be deducted from the cost of water and sewage financial participation fees (connection fees) and similar fees charged by EMWD for any property owned by the Soboba Tribe within EMWD's then existing service area for which service is sought pursuant to an agreement for service between the Soboba Tribe and EMWD. The Soboba Tribe and EMWD agree to negotiate in good faith concerning any future agreement for service which shall be funded in whole or in part by the credit established pursuant to this paragraph.

C. LHMWD will make available for habitat preservation and/or environmental mitigation purposes property it owns in the San Jacinto River bed, consisting of approximately 12 acres which is described and illustrated in Exhibit L to this Settlement Agreement. This property shall be used for habitat preservation and/or environmental mitigation to assist in meeting the requirements of applicable Federal and State environmental laws relating to the Recharge Facilities.

D. In consideration for the benefits received under this Settlement Agreement, the Soboba Tribe shall make available, without transfer of title, up to 98 acres of land for habitat preservation and/or environmental mitigation to assist in meeting the requirements of applicable Federal and State environmental laws relating to the Recharge Facilities. The area from which the Soboba Tribe, in consultation with the United States Fish and Wildlife Service, will select the land to be used for these purposes is described and illustrated in Exhibit M of this Settlement Agreement.

E. The Soboba Tribe agrees to provide the Local Districts with all information reasonably available to the Soboba Tribe that the Local Districts and the Soboba Tribe agree is required to implement this Settlement Agreement and the WMP.

F. MWD shall not be joined in any legal proceeding to enforce the Tribal Water Right described in Sections 4.1 through 4.3 or which concerns the duties and obligations

reflected at Section 4.8, paragraphs A through E, unless said proceeding relates to MWD's failure to perform its obligations to deliver water set forth in Section 4.4.

ARTICLE 5 - RELEASES AND WAIVERS

5.1 Soboba Tribe

A. The Soboba Tribe, on behalf of itself and its members, and the United States solely in its capacity as trustee for the Tribe releases EMWD, LHMWD, and MWD for:

(1) All past, present and future claims to Surface and Groundwater rights for the Reservation, from time immemorial through the Effective Date and anytime thereafter;

(2) All past, present and future claims for injury of any kind, whether to person, property, or other right or interest, arising from, or in any way related to, interference with Surface and Groundwater rights and resources of the Reservation, including, but not limited to, all claims for injury to the Soboba Tribe's use and enjoyment of the Reservation, economic development, religion, language, social structure and culture, and injury to the natural resources of the Reservation, from time immemorial through the Effective Date;

(3) All past, present and future claims for injury of any kind, whether to person, property, or other right or interest, arising from, or in any way related to, continuing interference with Surface and Groundwater rights and resources of the Reservation, including the full scope of claims defined in Section 5.1.A(2), to the extent that such continuing interference began prior to the Effective Date, from time immemorial through the Effective Date and anytime thereafter;

(4) All past, present and future claims for injury of any kind, whether to person, property, or other right or interest, arising from, or in any way related to, seepage of water into the Tunnel, including the full scope of claims defined in Section 5.1.A(2), from time immemorial through the Effective Date and anytime thereafter.

B. The Soboba Tribe, on behalf of itself and its members, releases the United States for:

(1) All claims described in Section 5.1.A(1)-(4);

(2) All past, present and future claims for failure to acquire or develop water rights

and resources of the Reservation from time immemorial through the Effective Date and anytime thereafter;

(3) All past, present and future claims for failure to protect water rights and resources of the Reservation from time immemorial through the Effective Date, and any past, present and future claims for any continuing failure to protect water rights and resources of the Reservation, from time immemorial through the Effective Date and, to the extent that such continuing failure to protect began before the Effective Date, anytime thereafter;

(4) All past, present and future claims arising from the failure of any non-federal Party to fulfill the terms of this Settlement Agreement at anytime.

(5) All past, present, and future claims arising out of the negotiation of this Settlement Agreement or the negotiation and enactment of the Act, or any specific terms or provisions thereof, including but not limited to the Soboba Tribe's consent to limit the number of participant parties to this Settlement Agreement.

C. The Soboba Tribe, on behalf of itself and its members, expressly preserves as against all Parties all rights and remedies relating to:

(1) The enforcement of this Settlement Agreement;

(2) The infringement of any water rights arising under Federal or State law which may be appurtenant to property, other than the Reservation, that is now owned or hereafter acquired by the Soboba Tribe, excepting claims identified in Section 5.1.A(4), which relate to Tunnel seepage, and any challenge to approved portions of the WMP.

D. The Soboba Tribe agrees to defend, indemnify, and hold harmless EMWD, LHMWD, MWD, and the United States for any claim seeking damages or other form of relief based upon the rights released by the Soboba Tribe in Section 5.1.A and B, and all of their respective subparts.

5.2 EMWD

A. EMWD shall release LHMWD, MWD, the Soboba Tribe, and the United States from:

(1) All past and present claims arising from or in any way related to the claims released by the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe in Section 5.1, A and B, and all of their respective subparts; and

(2) All past and present claims arising from, or in any way related to, interference with EMWD's Surface and Groundwater rights under Federal or State law from time immemorial through the Effective Date, including, but not limited to, all rights originally belonging to EMWD's predecessors and/or otherwise acquired by EMWD prior to the Effective Date .

B. Notwithstanding the dispute between EMWD and MWD over the scope of EMWD's defense and indemnity obligations reflected in Section 8 of Resolution 3940 (the Terms of Annexation) or the language of Section 8, EMWD shall defend and indemnify MWD against all demands, claims, suits, or other administrative or legal proceedings arising from, or in anyway connected to, the infiltration of water into the Tunnel. This obligation shall apply irrespective of when the claim arose or the alleged infringement, harm, or injury occurred.

C. EMWD expressly preserves all rights and remedies relating to:

(1) As against all Parties, the enforcement of this Settlement Agreement;

(2) As against all Parties, the infringement of any water rights arising under State law acquired in the future by EMWD; and

(3) As against MWD, the Terms of Annexation, except as expressly agreed to in Section 5.2.B.

5.3 LHMWD

A. LHMWD shall release EMWD, MWD, the Soboba Tribe, and the United States from:

(1) All past and present claims arising from or in any way related to the claims released by the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe in Section 5.1.A and B, and all of their respective subparts; and

(2) All past and present claims arising from, or in any way related to, interference

with LHMWD's Surface and Groundwater rights under Federal or State law from time immemorial through Effective Date.

B. LHMWD expressly preserves all rights and remedies relating to:

(1) As against all Parties, the enforcement of this Settlement Agreement; and

(2) As against all Parties, the infringement of any water rights arising under State law acquired in the future by LHMWD.

5.4 MWD

A. MWD shall release EMWD, LHMWD, the Soboba Tribe, and the United States from:

(1) All past and present claims arising from or in any way related to the claims released by the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe in Section 5.1.A and B, and all of their respective subparts; and

(2) All past and present claims arising from, or in any way related to, interference with MWD's Surface and Groundwater rights under Federal or State law from time immemorial through the Effective Date .

B. MWD expressly preserves all rights and remedies relating to:

(1) As against all Parties, the enforcement of this Settlement Agreement;

(2) As against all Parties, the infringement of any water rights arising under State law acquired in the future by MWD; and

(3) As against EMWD, the Terms of Annexation, except as expressly agreed to in Section 5.2.B.

5.5 All Parties Release of Unknown Claims.

A. Each Party acknowledges and agrees that certain of the releases reflected in Sections 5.1 through 5.5 apply to all claims whether known or unknown to the releasing Party.

B. Each Party certifies that it has read the following provisions of California Civil Code Section 1542:

“A general release does not extend to claims which the creditor does not know or suspect

to exist in his favor at the time of executing the release, which if known by him must have materially affected his settlement with the debtor.ö

C. Each Party waives the application of California Civil Code Section 1542. In doing so, each Party acknowledges that it is consciously releasing claims that may exist as of the date of this release but which it does not know exist, and which, if known, would materially affect its decision to execute this Settlement Agreement, regardless of whether the Parties' lack of knowledge is the result of ignorance, oversight, error, negligence, or any other cause.

5.6 Waiver of Sovereign Immunity. If any Party to this Settlement Agreement brings an action or other proceeding in any court of the United States relating only and directly to the interpretation or enforcement of the Act or the Settlement Agreement and names the United States or the Soboba Tribe as a party, the United States, the Tribe, or both, may be joined in any such action, and any claim by the United States or the Tribe to sovereign immunity from the action is waived, other than with respect to claims for monetary awards, for the limited and sole purpose of such interpretation or enforcement.

ARTICLE 6- ADMINISTRATION AND OTHER CONSIDERATIONS

6.1 Disclaimer. Nothing in this Settlement Agreement shall be construed as establishing any standard to be used for the quantification of Federal reserved rights, aboriginal claims, or any other Indian claims to water or lands in any judicial or administrative forum or proceeding. Nothing in this Settlement Agreement shall be construed to quantify or otherwise affect the water rights, claims or entitlements to water of any California tribe, band or community other than the Soboba Tribe.

6.2 Evidentiary Effect of Negotiations. This Settlement Agreement has been arrived at in the process of good faith negotiation for the purpose of resolving legal disputes, including pending litigation, and all Parties agree that no conduct, statements, offers, or compromises made in the course thereof shall be construed as admissions against interest or be used in any legal forum or proceeding other than one for approval, confirmation, interpretation, or enforcement of this Settlement Agreement.

6.3 Authorship. The Parties agree that this Settlement Agreement reflects the joint drafting efforts of all Parties. In the event that any dispute, disagreement, or controversy arises regarding this Settlement Agreement, the Parties shall be considered joint authors and no provision shall be interpreted against any Party because of authorship.

6.4 Authorization to Execute. Each Party represents and warrants that she or he is authorized to execute this Settlement Agreement on behalf of the respective Parties to this Settlement Agreement and does so freely and voluntarily.

6.5 Effect of Execution by the Districts. Execution of this Settlement Agreement by the Districts signifies that provisions of this Settlement Agreement affecting the Districts have been approved by their respective Boards of Directors, and these agencies assume the obligations of and are entitled to the benefits of this Settlement Agreement.

6.6 No Inducements. Each Party acknowledges and represents that in executing this Settlement Agreement it has not relied upon any inducements, promises, or representations made by the other Parties which are not reflected in this Settlement Agreement.

6.7 Advice of Counsel. Each Party warrants and represents that, in executing this Settlement Agreement, it has relied upon legal advice from counsel of its choice; that the terms of this Settlement Agreement have been read and its consequences have been completely explained to it by counsel; and that it fully understands the terms of this Settlement Agreement.

6.8 Contingent on Appropriation of Funds. The expenditure or advance of any money or the performance of any obligation by the United States under this Settlement Agreement is contingent upon appropriation of funds therefor. If funds are not appropriated, the United States shall accrue no liability.

6.9 Officials Not to Benefit. No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Settlement Agreement or to any benefit that may arise from this Settlement Agreement. This restriction shall not be construed to extend to this Settlement Agreement if made with a corporation or company for its general benefit.

6.10 Counterparts. This Settlement Agreement may be signed in counterparts by one or more of the Parties, and those counterparts, when taken together, shall have the same force and effect as if a single, original document had been signed by all the Parties.

6.11 Jurisdiction. The Decree Court retains jurisdiction over the Judgment and Decree and the Settlement Agreement.

6.12 Governing Law. This Settlement Agreement shall be construed in accordance with Federal laws and where appropriate the laws of the State of California.

6.13 Successors and Assigns. This Settlement Agreement and the attached waivers and agreements shall, unless otherwise indicated, be binding on and inure to the benefit of the Parties, and their respective successors and assigns.

6.14 Integration. This Settlement Agreement incorporates all the exhibits and sets forth the entire agreement of the Parties with respect to the subject matter hereof, with the exception that EMWD and MWD have resolved certain rights and obligations by way of a Partial Settlement Agreement dated November 14, 2001 which shall remain binding on those two Parties only. This Settlement Agreement may be amended only by written agreement executed by the Parties.

ARTICLE 7- NOTICE AND SIGNATURES

7.1 Notices. Any notice or other communication given under this Settlement Agreement must be in writing and delivered by overnight courier service or certified mail, return receipt requested, postage prepaid and properly addressed to the Parties at the addresses listed below (or to any other or further addresses the Parties may subsequently designate by notice in this manner). All these notices and communication shall be effective when delivery to the required recipient is completed in accordance with this paragraph:

To the Soboba Tribe:

Chairperson
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581

To the United States of America: Asst. Secretary for Indian Affairs
U.S. Department of the Interior
1849 C St. NW 4104 MIB
Washington, DC 20240-0001
Chief, U.S. Dept. of Justice
Indian Resources Section
P.O. Box 44378
L'Enfant Plaza Station Washington, DC 20026-4378

cc: Regional Director
Bureau of Indian Affairs
Pacific Region
2800 Cottage Way
Sacramento, CA 95825

To EMWD: General Manager
Eastern Municipal Water District
P.O. Box 8300
Perris, CA 92572-8300

To LHMWD: General Manager
Lake Hemet Municipal Water District
2480 East Florida Avenue
P.O. Box 5039
Hemet, CA 92544

To MWD: Chief Executive Officer
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, California 90054-0153

General Counsel
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, California 90054-0153

IN WITNESS WHEREOF, the Parties have executed this Settlement Agreement on the
day and year written below.

SOBOBA BAND OF LUISEÑO INDIANS

Date: _____

By: _____
Robert J. Salgado Sr., Chairman

THE UNITED STATES OF AMERICA

Date: _____

By: _____

THE EASTERN MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
Randy A. Record, President

THE LAKE HEMET MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
Joseph D. Van Sickle, President

THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA

Date _____

By: _____
Jeffrey Kightlinger, General Manager

EXHIBITS TO SETTLEMENT AGREEMENT

- A. Soboba Settlement Act
- B. Map of the Basin and San Jacinto River
- C. Description of the Basin
- D. Map of the Soboba Reservation
- E. Principles for Water Management
- F. Map of the Water Management Plan Area
- G. Description of the Water Management Plan Area
- H. Judgment and Decree
- I. Soboba Tribes' Water Development Schedule
- J. Description of EMWD Property
- K. Description of MWD Property
- L. Description of LHMWD Property
- M. Map of Potential Soboba Reservation Lands for Habitat Preservation and/or
Environmental Mitigation

Exhibit A – Soboba Settlement Act

SEC. 1. SHORT TITLE.

This Act may be cited as the ‘Soboba Band of Luiseño Indians Settlement Act’.

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.— The Congress finds the following—

(1) The Soboba Band of Luiseño Indians is a federally-recognized Indian tribe whose Reservation of approximately 6,000 acres, extending east and north from the banks of San Jacinto River in Riverside County, California, was created by an Executive Order of June 19, 1883, and enlarged and modified by subsequent Executive Orders, purchases, and an Act of Congress.

(2) The Tribe’s water rights have not been quantified, and the Tribe has longstanding unresolved claims for interferences with the water resources of its Reservation, which the Tribe maintains have rendered much of the Tribe’s Reservation useless for habitation, livestock, or agriculture. On April 20, 2000, the Tribe filed a lawsuit against The Metropolitan Water District of Southern California for interference with the Tribe’s water resources and damages to its Reservation allegedly caused by Metropolitan’s construction and operation of the San Jacinto Tunnel, which is part of the Colorado River Aqueduct. The lawsuit, styled *Soboba Band of Luiseño Indians v. Metropolitan Water District of Southern California*, No. 00-04208 GAF (MANx), is pending in the United States District Court for the Central District of California.

(3) The Tribe also has made claims against Eastern Municipal Water District and Lake Hemet Municipal Water District, located adjacent to the Reservation, seeking to secure its water rights and damages arising from alleged past interference with the Tribe’s water resources.

(4) Recognizing that the final resolution of its water rights and claims through litigation will take many years and entail great expense to all parties, continue to limit the Tribe's access to water with economic, social, and cultural consequences to the Tribe, prolong uncertainty as to the availability of water supplies, and seriously impair the long-term economic planning and development of all parties, the Tribe and non-Indian entities have sought to settle their water-related disputes and reduce the burdens of litigation.

(5) After negotiations, which included participation by representatives of the Tribe, the United States, The Metropolitan Water District of Southern California, Eastern Municipal Water District, and Lake Hemet Municipal Water District, the parties have entered into a Settlement Agreement to determine the Tribe’s water rights, resolve all of its claims for interference with the water resources of, and damages to, its Reservation, and provide for the construction of water projects to facilitate the exercise of the Tribe's rights.

(6) Pursuant to the Settlement Agreement, Eastern Municipal Water District and Lake Hemet Municipal Water District acknowledge and assure the Tribe’s prior and paramount right, superior to all others, to pump 9,000 acre-feet of water annually from the San Jacinto River basin. To provide water to the Tribe and to

reduce the overdraft of the basin, the two water districts and The Metropolitan Water District of Southern California will contract to import and recharge supplemental water supplies into the basin. The water districts also will make substantial additional contributions to the settlement, including the conveyance of certain replacement lands and economic development funds to the Tribe, to carry out the Settlement Agreement's provisions.

(7) It is appropriate that the United States participate in the implementation of the Settlement Agreement, and contribute funds to enable the Tribe to use its water entitlement in developing its Reservation, and to assist the neighboring non-Indian entities in the construction, operation, and maintenance of the facilities required to recharge the imported water.

(b) **PURPOSES.**— The purposes of this Act are—

- (1) to approve, ratify, and confirm the Settlement Agreement entered into by the Tribe and non-Indians entities;
- (2) to authorize and direct the Secretary of the Interior to execute and perform the Settlement Agreement and related waivers;
- (3) to authorize the actions, agreements, and appropriations as provided in the Settlement Agreement and this Act.

SEC. 3. DEFINITIONS.

In this Act—

- (1) **RESTORATION FUND.**— The term ‘Restoration Fund’ means the San Jacinto Basin Restoration Fund established by section 6 of this Act.
- (2) **DEVELOPMENT FUND.**— The term ‘Development Fund’ means the Soboba Band of Luiseño Indians Water Development Fund established by section 7 of this Act.
- (3) **RESERVATION.**— The term ‘Reservation’ means the Soboba Indian Reservation created by an Executive Order dated June 19, 1883, and enlarged and modified by subsequent Executive Orders, purchases, and an Act of Congress, excluding the 950 acres northwest of and contiguous to the Reservation known as the “Jones Ranch,” purchased by the Soboba Tribe in fee on July 21, 2001, and placed into trust on January 13, 2003, the 129.19 acres southeast of and contiguous to the Reservation known as the “Horseshoe Properties,” purchased by the Soboba Tribe in fee in four separate transactions in June and December 2001, and the 478 acres north of and contiguous to the Reservation known as “Kwiili,” purchased by the Soboba Tribe in fee on April 4, 2004.
- (4) **SECRETARY.**— The term ‘Secretary’ means the Secretary of the Interior or her designee.
- (5) **SETTLEMENT AGREEMENT.**— The term ‘Settlement Agreement’ means that agreement dated _____, 2004, together with all exhibits thereto. The parties to the Settlement Agreement are the Soboba Band of Luiseño Indians and its members, the United States on behalf of the Tribe and its members, The

Metropolitan Water District of Southern California, Eastern Municipal Water District, and Lake Hemet Municipal Water District.

(6) **TRIBE, SOBOBA TRIBE, or SOBOBA BAND OF LUISEÑO INDIANS.**— The terms ‘Tribe’, ‘Soboba Tribe’, or ‘Soboba Band of Luiseño Indians’ means the body politic and federally recognized Indian tribe, and its members.

(7) **WATER MANAGEMENT PLAN.**— The term ‘Water Management Plan’ means the plan, approved by the Soboba Tribe and the Secretary, developed pursuant to Section 4.8, paragraph A of the Settlement Agreement to resolve the overdraft of the San Jacinto basin.

SEC. 4. RATIFICATION OF SETTLEMENT AGREEMENT; AUTHORIZATION.

(a) **IN GENERAL.**— The United States hereby approves, ratifies, and confirms the Settlement Agreement, except to the extent it conflicts with the provisions of this Act, and consents to be made a party to the pending action described in section 2, paragraph (a)(2) of this Act for the purpose of entering the judgment and decree attached to the Settlement Agreement as Exhibit H.

(b) **AUTHORIZATION.**— The Secretary is authorized and directed to execute, and take such other actions as are necessary to implement, the Settlement Agreement and any amendments approved by the parties necessary to make the Settlement Agreement consistent with this Act.

SEC. 5. AUTHORIZATION OF APPROPRIATIONS.

(a) **RESTORATION FUND.**— There is authorized to be appropriated to the San Jacinto Basin Restoration Fund established in section 6 of this Act the amount of \$10,000,000 to pay or reimburse costs associated with constructing, operating, and maintaining the portion of the basin recharge project, described in Section 4.5 of the Settlement Agreement, necessary to accommodate deliveries of the supplemental imported water under Section 4.4 of the Settlement Agreement.

(b) **DEVELOPMENT FUND.**— There is authorized to be appropriated to the Soboba Band of Luiseño Indians Water Development Fund established in section 7 of this Act the amount of \$11,000,000 to pay or reimburse costs associated with constructing, operating, and maintaining water and sewage infrastructure, and other water-related development projects.

SEC. 6. RESTORATION FUND.

(a) **ESTABLISHMENT.**— There shall be established within the Treasury of the United States a non-interest bearing account to be known as the ‘San Jacinto Basin Restoration Fund’, consisting of the amounts authorized to be appropriated in section 5, paragraph (a) of this Act.

(b) **ADMINISTRATION.**— The Restoration Fund shall be administered by the Secretary for the purposes set forth in paragraph (d) of this section.

(c) AVAILABILITY.— The funds authorized to be appropriated pursuant to section 5, paragraph (a) of this Act shall be available for expenditure or withdrawal only after the requirements set forth in section 9(e) of this Act and paragraph (d) of this section have been met.

(d) EXPENDITURES AND WITHDRAWALS.—

(1) EXPENDITURE PLAN.—

(A) IN GENERAL.— Eastern Municipal Water District, on behalf of the Water Management Plan, shall submit to the Secretary for approval an expenditure plan for use of the Restoration Fund.

(B) REQUIREMENTS.— The expenditure plan shall require that any funds be expended or reimbursed in accordance with the purposes described in section 5, paragraph (a) of this Act.

(C) APPROVAL.— The Secretary shall approve the expenditure plan if it is reasonable and not inconsistent with this Act.

(2) WITHDRAWALS.— On approval by the Secretary of the expenditure plan described in this section, Eastern Municipal Water District, on behalf of the Water Management Plan, may withdraw monies from the Restoration Fund as provided in the plan.

(3) ENFORCEMENT.— The Secretary may take judicial or administrative action to enforce the provisions of any expenditure plan to ensure that monies withdrawn from the Restoration Fund under the plan are used in accordance with this Act.

(4) LIABILITY.— If Eastern Municipal Water District, on behalf of the Water Management Plan, exercises the right to withdraw monies from the Restoration Fund, neither the Secretary nor the Secretary of the Treasury shall retain any liability for the expenditure or investment of the monies withdrawn.

(5) ANNUAL REPORT.— Eastern Municipal Water District shall submit to the Tribe and the Secretary an annual report that describes all expenditures from the Restoration Fund during the year covered by the report.

SEC. 7. DEVELOPMENT FUND.

(a) ESTABLISHMENT.— There shall be established within the Treasury of the United States an interest bearing account to be known as the ‘Soboba Band of Luiseño Indians Water Development Fund’, to be managed and invested by the Secretary, consisting of the amounts authorized to be appropriated in section 5, paragraph (b) of this Act.

(b) MANAGEMENT.— The Secretary shall manage the Development Fund, make investments, and make monies available for distribution consistent with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 et seq.) (referred to in this section as the ‘Trust Fund Reform Act’), this Act, and the Settlement Agreement.

(c) INVESTMENT.— The Secretary shall invest amounts in the Development Fund in accordance with—

(1) the Act of April 1, 1880 (21 Stat. 70, ch. 41, 25 U.S.C. 161);

(2) the first section of the Act of June 24, 1938 (52 Stat. 1037, ch. 648, 25 U.S.C. 162a); and

(3) paragraph (b) of this section.

(d) AVAILABILITY.— The funds authorized to be appropriated pursuant to section 5, paragraph (b) of this Act shall be available for expenditure or withdrawal only after the requirements set forth in section 9(e) of this Act and paragraph (e) below have been met.

(e) EXPENDITURES AND WITHDRAWALS.—

(1) TRIBAL MANAGEMENT PLAN.—

(A) IN GENERAL.— The Tribe may withdraw all or part of the Development Fund on approval by the Secretary of a tribal management plan as described in the Trust Fund Reform Act.

(B) REQUIREMENTS.— In addition to the requirements under the Trust Fund Reform Act, the tribal management plan shall require that any funds be expended or reimbursed in accordance with the purposes described in section 5, paragraph (b) of this Act.

(2) ENFORCEMENT.— The Secretary may take judicial or administrative action to enforce the provisions of any tribal management plan to ensure that monies withdrawn from the Development Fund under the plan are used in accordance with this Act.

(3) LIABILITY.— If the Tribe exercises the right to withdraw monies from the Development Fund, neither the Secretary nor the Secretary of the Treasury shall retain any liability for the expenditure or investment of the monies withdrawn.

(4) ANNUAL REPORT.— The Tribe shall submit to the Secretary an annual report that describes all expenditures from the Development Fund during the year covered by the report.

(5) NO PER CAPITA DISTRIBUTIONS.— No part of the Development Fund shall be distributed on a per capita basis to members of the Tribe.

SEC. 8. WAIVERS AND RELEASES.

(a) TRIBE AND UNITED STATES AUTHORIZATION.— The Tribe, on behalf of itself and its members, and the Secretary, on behalf of the United States in its capacity as trustee for the Tribe and its members, are authorized, as part of the performance of their obligations under the Settlement Agreement, to execute a waiver and release for claims under Federal, State, or other law against The Metropolitan Water District of Southern California, Eastern Municipal Water District and Lake Hemet Municipal Water District, for any and all—

(1) past, present, and future claims to surface and groundwater rights for the Reservation from time immemorial through the effective date described in section 10 of this Act and anytime thereafter;

(2) past, present, and future claims for injury of any kind, whether to person, property, or other right or interest, arising from, or in any way related to,

interference with surface and groundwater rights and resources of the Reservation, including, but not limited to, all claims for injury to the Tribe's use and enjoyment of the Reservation, economic development, religion, language, social structure and culture, and injury to the natural resources of the Reservation, from time immemorial through the effective date described in section 10 of this Act;

(3) past, present, and future claims for injury of any kind, whether to person, property, or other right or interest, arising from, or in any way related to, continuing interference with surface and groundwater rights and resources of the Reservation, including the full scope of claims defined in Section 5.1, paragraph A(2) of the Settlement Agreement, to the extent that such continuing interference began prior to the effective date described in section 10 of this Act, from time immemorial through the effective date described in section 10 of this Act and anytime thereafter; and

(4) past, present, and future claims for injury of any kind, whether to person, property, or other right or interest, arising from, or in any way related to, seepage of water into the San Jacinto Tunnel, including the full scope of claims defined in Section 5.1, paragraph A(2) of the Settlement Agreement, from time immemorial through the effective date described in section 10 of this Act and anytime thereafter.

(b) **TRIBAL WAIVERS AGAINST THE UNITED STATES.**— The Tribe is authorized, as part of the performance of its obligations under the Settlement Agreement, to execute a waiver and release for claims against the United States (acting in its capacity as trustee for the Tribe or its members, or otherwise acting on behalf of the Tribe or its members), including any agencies, officials, or employees thereof, for any and all—

(1) claims described in paragraph (a) of this section;

(2) past, present, and future claims for failure to acquire or develop water rights and resources of the Reservation from time immemorial through the effective date described in section 10 of this Act and anytime thereafter;

(3) past, present, and future claims for failure to protect water rights and resources of the Reservation from time immemorial through the effective date described in section 10 of this Act, and any past, present, and future claims for any continuing failure to protect water rights and resources of the Reservation, from time immemorial through the effective date described in section 10 of this Act and, to the extent that such continuing failure to protect began before the effective date described in section 10 of this Act, anytime thereafter;

(4) past, present, and future claims arising from the failure of any non-federal Party to fulfill the terms of the Settlement Agreement at anytime; and

(5) past, present, and future claims arising out of the negotiation of the Settlement Agreement or the negotiation and enactment of this Act, or any specific terms or provisions thereof, including, but not limited to, the Tribe's consent to limit the number of participant parties to the Settlement Agreement.

SEC. 9. MISCELLANEOUS PROVISIONS.

(a) **WAIVER OF SOVEREIGN IMMUNITY.**– If any party to the Settlement Agreement brings an action or other proceeding in any court of the United States relating only and directly to the interpretation or enforcement of this Act or the Settlement Agreement and names the United States or the Soboba Tribe as a party–

- (1) the United States, the Tribe, or both, may be joined in any such action; and
- (2) any claim by the United States or the Tribe to sovereign immunity from the action is waived, other than with respect to claims for monetary awards, for the limited and sole purpose of such interpretation or enforcement.

(b) **TRIBAL USE OF WATER.**–

(1) **IN GENERAL.**– With respect to water rights made available under the Settlement Agreement–

(A) the Tribe may use water made available to it under the Settlement Agreement for any use it deems advisable on the Reservation and on any other lands it owns or may acquire, in fee or in trust, contiguous to the Reservation or within the area of the groundwater basin described in Section 2.4 of the Settlement Agreement;

(B) such water rights shall be held in trust by the United States in perpetuity, and shall not be subject to forfeiture or abandonment; and

(C) State law shall not apply to the Tribe’s use of water made available to it under the Settlement Agreement.

(2) **LIMITATION.**–

(A) **IN GENERAL.**– Except as provided in paragraph (B) below, the Tribe shall not sell or lease water made available to it under the Settlement Agreement.

(B) **EXCEPTION.**– The Tribe may enter into contracts and options to lease, contracts and options to exchange, or contracts and options to forbear the use of water made available to it under the Settlement Agreement or postpone undertaking new or expanded water uses, provided that any such contract or option for a term greater than five years shall require the approval of the Secretary. Any such water thereby made available to others shall only be used by participants in, or other users within the area of, the Water Management Plan described in Section 2.32 of the Settlement Agreement. No contract shall be for a term exceeding one hundred years, nor shall any contract provide for permanent alienation of any portion of the water rights made available under the Settlement Agreement.

(c) **ACCEPTANCE OF LAND INTO TRUST.**– The Secretary shall accept into trust for the benefit of the Tribe the lands conveyed to the Tribe pursuant to Section 4.6 of the Settlement Agreement, which conveyed lands shall be considered for all purposes as if

they were so acquired into trust status in 1937, except as to valid rights existing at the time of acquisition pursuant to this Act.

(d) **HABITAT CONSERVATION.**— The United States, in its capacity as trustee for the Tribe, and the Tribe in its own right shall make available, including, if necessary, by conveyance of a permanent easement to the United States Fish and Wildlife Service or other agency of the United States, up to 98 acres of Reservation land for habitat conservation related to the portion of the basin recharge project necessary to accommodate deliveries of the supplemental imported water described in Section 4.4 of the Settlement Agreement.

(e) **AVAILABILITY OF APPROPRIATIONS.**— The funds authorized to be appropriated under section 5 of this Act shall not be available for expenditure or withdrawal until the requirements of section 10(a) of this Act have been met and the waivers and releases set out in section 8 of this Act become effective.

(f) **RETENTION OF RIGHTS.**—

(1) In the event the waivers and releases set out in section 8 of this Act do not become effective pursuant to section 10(a) of this Act, the Soboba Tribe and the United States shall retain the right to assert all rights and claims enumerated in section 8, and any claims or defenses of the parties to the Settlement Agreement shall also be retained.

(2) The parties expressly reserve all rights not specifically granted, recognized, waived, or released by the Settlement Agreement or this Act.

(g) **PRECEDENT.**— Nothing in this Act shall be construed or interpreted as a precedent for the quantification or litigation of federal reserved water rights or the interpretation or administration of future water settlement Acts.

(h) **OTHER INDIAN TRIBES.**— Nothing in the Settlement Agreement or this Act shall be construed in any way to quantify or otherwise adversely affect the water rights, claims, or entitlements to water of any Indian tribe, band, or community, other than the Soboba Tribe.

(i) **ENVIRONMENTAL COMPLIANCE.**—

(1) Signing by the Secretary of the Settlement Agreement does not constitute major Federal action under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(2) The Secretary shall comply with all aspects of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), and other applicable environmental laws, in implementing the terms of the Settlement Agreement and this Act.

SEC. 10. EFFECTIVE DATE.

(a) **IN GENERAL.**— The waiver and release authorizations contained in subsections (b) and (c) of section 8 of this Act shall become effective as of the date the Secretary causes to be published in the Federal Register a statement of findings that—

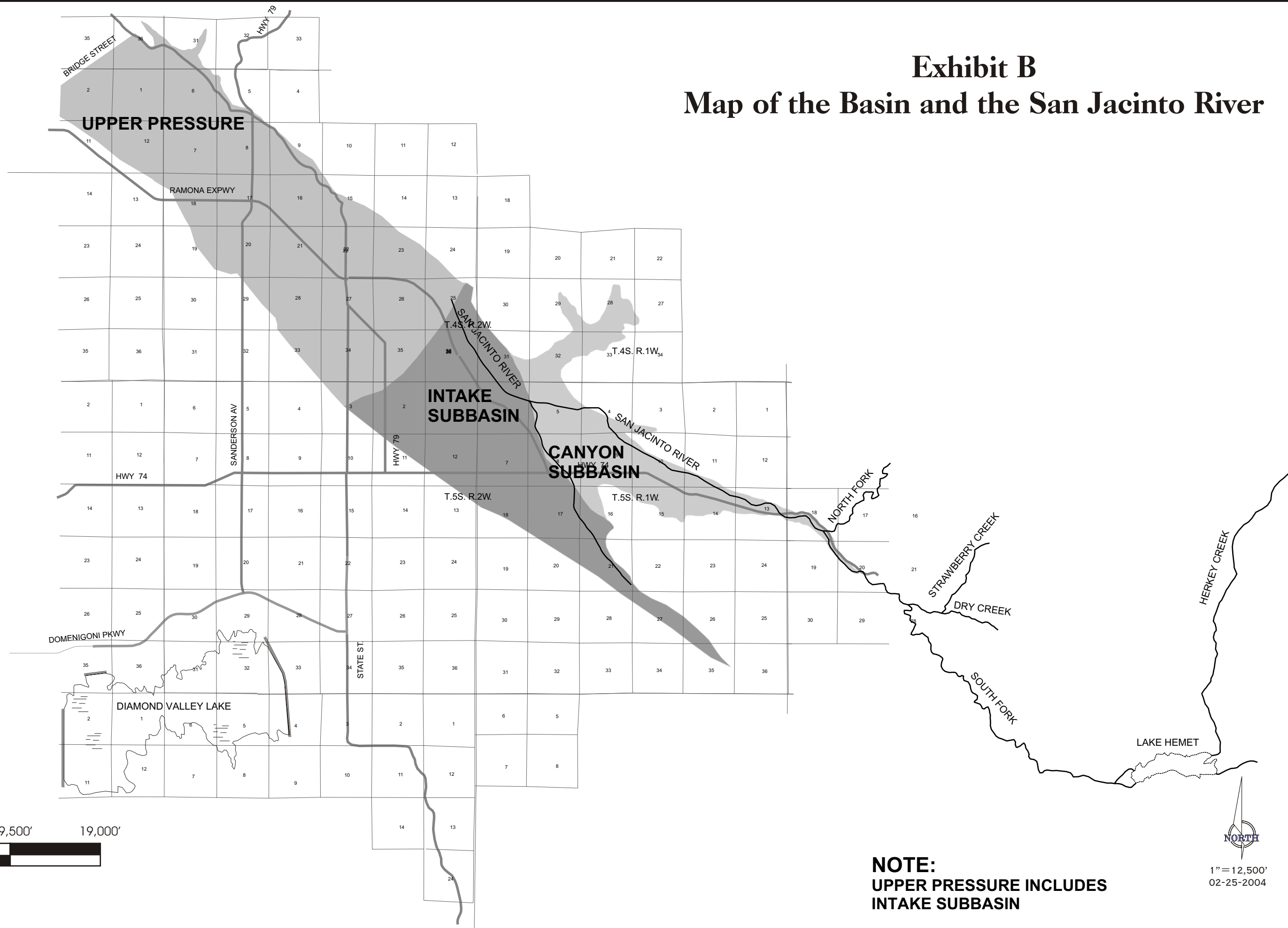
(1) this Act has been enacted;

- (2) to the extent that the Settlement Agreement conflicts with this Act, the Settlement Agreement has been revised to conform with the Act;
- (3) the Settlement Agreement, revised as necessary, and the waivers and releases described in Article 5 of the Settlement Agreement and section 8 of this Act have been executed by the parties and the Secretary;
- (4) warranty deeds for the property to be conveyed to the Tribe described in section 4.6 of the Settlement Agreement have been placed in escrow;
- (5) the Tribe and the Secretary have approved the Water Management Plan;
- (6) the judgment and decree attached to the Settlement Agreement as Exhibit H has been approved by the United States District Court, Eastern Division of the Central District of California, and that judgment and decree have become final and nonappealable; and
- (7) the payment of the funds authorized by section 5 of this Act have been appropriated and deposited into the Restoration Fund and the Development Fund.

(b) DEADLINE FOR EFFECTIVE DATE.— If the conditions precedent required under paragraph (a) of this section have not been fulfilled by December 31, 2007, the Settlement Agreement and this Act shall not thereafter be effective and shall be null and void. Any funds and the interest accrued thereon appropriated pursuant to section 5 shall revert to the general fund of the United States Treasury on October 1, 2008.

Exhibit B

Map of the Basin and the San Jacinto River



NOTE:
UPPER PRESSURE INCLUDES
INTAKE SUBBASIN

Exhibit C – Description of the Basin

Legal Description for Canyon Sub-basin

Beginning at a point lying North 03-03-37 East, a distance of 8693.42 feet from the north one quarter corner of Section 7, Township 5 South, Range 1 East, S.B.B. & M.:

Thence South 33-29-10 East, a distance of 1188.9727
Thence South 20-26-50 East, a distance of 500.9370
Thence South 27-28-23 East, a distance of 428.6517
Thence South 31-35-33 East, a distance of 630.8741
Thence South 21-07-46 East, a distance of 910.5965
Thence South 18-48-47 East, a distance of 1015.1730
Thence South 24-22-09 East, a distance of 638.3066
Thence South 14-50-24 East, a distance of 1778.9616
Thence South 09-47-36 East, a distance of 1132.4407
Thence South 10-53-51 East, a distance of 909.1444
Thence South 21-23-19 East, a distance of 960.3948
Thence South 16-05-57 East, a distance of 627.4825
Thence South 17-13-52 East, a distance of 1029.1928
Thence South 26-09-14 East, a distance of 249.2721
Thence South 46-45-44 East, a distance of 1246.0249
Thence South 45-42-20 East, a distance of 804.0414
Thence South 53-45-51 East, a distance of 494.8303
Thence South 41-51-15 East, a distance of 662.8068
Thence South 37-57-12 East, a distance of 682.2970
Thence South 44-35-54 East, a distance of 598.8896
Thence South 31-20-45 East, a distance of 1101.0137
Thence South 37-47-48 East, a distance of 1333.2990
Thence South 55-04-55 East, a distance of 865.4271
Thence South 61-29-59 East, a distance of 379.0620
Thence South 66-22-49 East, a distance of 339.4363
Thence South 42-07-01 East, a distance of 362.8961
Thence South 59-20-26 East, a distance of 310.8241
Thence North 44-35-20 West, a distance of 271.0057
Thence North 27-14-21 West, a distance of 679.4763
Thence North 09-26-25 West, a distance of 669.1250
Thence North 15-50-43 West, a distance of 716.4738
Thence North 22-47-41 West, a distance of 436.5304
Thence North 20-37-42 West, a distance of 399.1550
Thence North 05-56-49 West, a distance of 259.3960
Thence North 12-05-28 West, a distance of 264.3646
Thence North 14-27-19 East, a distance of 118.1782
Thence North 50-21-25 East, a distance of 158.1102
Thence North 65-13-15 East, a distance of 328.2188
Thence North 82-49-41 East, a distance of 264.3181
Thence South 84-49-29 East, a distance of 420.5895
Thence South 77-19-12 East, a distance of 411.1524
Thence South 62-03-23 East, a distance of 453.0744
Thence South 53-30-14 East, a distance of 237.5929
Thence South 57-59-51 East, a distance of 266.6488
Thence South 66-45-48 East, a distance of 360.0835
Thence South 74-02-50 East, a distance of 326.3171
Thence South 70-08-39 East, a distance of 314.8424
Thence South 63-01-30 East, a distance of 234.3736
Thence South 35-38-22 East, a distance of 237.4798

Exhibit C – Description of the Basin

57	Thence South 42-04-07 East, a distance of 284.3200
58	Thence South 48-59-46 East, a distance of 322.1632
59	Thence South 55-05-28 East, a distance of 338.9985
60	Thence South 76-41-52 East, a distance of 627.2030
61	Thence South 80-50-12 East, a distance of 689.1699
62	Thence South 68-34-43 East, a distance of 243.1736
63	Thence South 51-17-14 East, a distance of 422.9187
64	Thence South 23-13-07 East, a distance of 305.0162
65	Thence South 17-07-37 East, a distance of 348.0598
66	Thence South 20-36-34 East, a distance of 243.2560
67	Thence South 77-20-44 East, a distance of 411.1112
68	Thence North 88-22-32 East, a distance of 489.4467
69	Thence South 89-35-23 East, a distance of 209.5054
70	Thence South 77-48-51 East, a distance of 428.1470
71	Thence South 46-33-41 East, a distance of 358.4156
72	Thence South 54-02-09 East, a distance of 300.5375
73	Thence North 76-21-42 East, a distance of 288.1242
74	Thence North 17-30-54 East, a distance of 237.5765
75	Thence North 16-48-48 East, a distance of 309.4149
76	Thence North 34-06-01 East, a distance of 125.9718
77	Thence North 84-56-56 East, a distance of 368.4308
78	Thence South 89-35-24 East, a distance of 227.1308
79	Thence South 79-15-43 East, a distance of 390.4622
80	Thence South 89-35-24 East, a distance of 751.1442
81	Thence North 68-02-21 East, a distance of 321.0451
82	Thence North 76-24-34 East, a distance of 144.1615
83	Thence North 82-57-46 East, a distance of 405.0514
84	Thence North 77-54-02 East, a distance of 322.0287
85	Thence South 66-25-23 East, a distance of 265.9506
86	Thence South 68-58-41 East, a distance of 149.3127
87	Thence North 54-52-10 East, a distance of 300.6385
88	Thence North 29-27-12 East, a distance of 179.7287
89	Thence North 56-43-55 East, a distance of 251.9098
90	Thence South 81-28-20 East, a distance of 370.4709
91	Thence South 78-57-07 East, a distance of 284.3959
92	Thence South 67-47-29 East, a distance of 470.2621
93	Thence South 83-24-48 East, a distance of 650.0405
94	Thence South 87-51-03 East, a distance of 576.6556
95	Thence North 81-40-49 East, a distance of 229.7933
96	Thence South 89-34-59 East, a distance of 524.0139
97	Thence South 80-08-29 East, a distance of 424.8993
98	Thence South 68-58-59 East, a distance of 149.1738
99	Thence South 85-18-12 East, a distance of 700.7279
100	Thence North 69-21-28 East, a distance of 243.2410
101	Thence North 83-18-13 East, a distance of 140.9616
102	Thence North 87-02-55 East, a distance of 297.3945
103	Thence South 84-24-08 East, a distance of 385.7145
104	Thence South 73-38-13 East, a distance of 381.5806
105	Thence South 60-46-31 East, a distance of 398.7573
106	Thence South 44-33-51 East, a distance of 197.5537
107	Thence South 44-36-26 East, a distance of 148.2746
108	Thence South 80-51-20 East, a distance of 229.6689
109	Thence South 77-41-23 East, a distance of 339.1733
110	Thence South 80-08-20 East, a distance of 106.1940
111	Thence South 74-17-21 East, a distance of 199.1918
112	Thence South 63-03-57 East, a distance of 156.1926

Exhibit C – Description of the Basin

113	Thence South 89-35-24 East, a distance of 139.7536
114	Thence North 69-52-16 East, a distance of 149.1074
115	Thence South 74-22-05 East, a distance of 199.2446
116	Thence South 54-02-09 East, a distance of 150.2688
117	Thence South 57-32-02 East, a distance of 164.7486
118	Thence South 80-08-39 East, a distance of 212.5112
119	Thence South 81-28-20 East, a distance of 246.9807
120	Thence South 57-34-32 East, a distance of 164.8208
121	Thence South 59-51-45 East, a distance of 281.7053
122	Thence South 49-18-45 East, a distance of 297.3849
123	Thence South 53-35-18 East, a distance of 237.6448
124	Thence South 41-33-00 East, a distance of 235.0086
125	Thence South 49-00-08 East, a distance of 483.1160
126	Thence South 55-49-43 East, a distance of 125.8518
127	Thence South 44-35-25 East, a distance of 123.5701
128	Thence South 44-36-30 East, a distance of 271.6237
129	Thence South 44-36-10 East, a distance of 197.5973
130	Thence South 31-11-39 East, a distance of 266.6825
131	Thence South 29-50-24 East, a distance of 242.6743
132	Thence South 26-09-18 East, a distance of 273.3663
133	Thence South 28-55-20 East, a distance of 320.7559
134	Thence South 44-37-15 East, a distance of 247.0063
135	Thence South 39-21-54 East, a distance of 136.3797
136	Thence South 39-30-43 East, a distance of 1115.9357
137	Thence South 56-57-13 East, a distance of 518.5041
138	Thence South 32-18-58 East, a distance of 290.6424
139	Thence South 54-36-52 East, a distance of 213.2716
140	Thence South 47-36-34 East, a distance of 234.9146
141	Thence South 44-35-24 East, a distance of 172.8920
142	Thence South 35-05-29 East, a distance of 150.2478
143	Thence South 59-20-24 East, a distance of 242.6739
144	Thence South 59-19-30 East, a distance of 242.5664
145	Thence South 89-35-24 East, a distance of 139.7536
146	Thence South 89-35-24 East, a distance of 139.7536
147	Thence South 89-35-23 East, a distance of 52.3763
148	Thence North 67-16-06 East, a distance of 132.9522
149	Thence North 00-24-32 East, a distance of 52.5643
150	Thence North 33-16-47 West, a distance of 62.8730
151	Thence North 58-37-01 West, a distance of 203.6710
152	Thence North 47-58-30 West, a distance of 210.3380
153	Thence North 50-17-39 West, a distance of 248.1038
154	Thence North 41-34-22 West, a distance of 235.0915
155	Thence North 35-34-47 West, a distance of 237.6102
156	Thence North 52-44-11 West, a distance of 261.9812
157	Thence North 49-21-11 West, a distance of 297.5341
158	Thence North 49-21-20 West, a distance of 297.3572
159	Thence North 44-34-50 West, a distance of 271.7576
160	Thence North 38-15-35 West, a distance of 335.4983
161	Thence North 27-27-57 West, a distance of 336.0671
162	Thence North 50-30-00 West, a distance of 360.1165
163	Thence North 21-23-39 West, a distance of 470.1461
164	Thence North 10-11-56 West, a distance of 284.4954
165	Thence North 07-44-11 West, a distance of 246.9982
166	Thence North 19-33-17 West, a distance of 204.2826
167	Thence North 41-52-09 West, a distance of 259.7636
168	Thence North 63-00-09 West, a distance of 429.5609

Exhibit C – Description of the Basin

169	Thence North 43-07-25 West, a distance of 481.8419
170	Thence North 42-44-17 West, a distance of 382.9316
171	Thence North 28-24-46 West, a distance of 398.7864
172	Thence North 28-23-07 West, a distance of 398.6130
173	Thence North 38-46-12 West, a distance of 608.4346
174	Thence North 72-21-04 West, a distance of 530.2057
175	Thence North 77-53-41 West, a distance of 517.3797
176	Thence North 84-31-51 West, a distance of 596.0885
177	Thence North 68-33-48 West, a distance of 486.5318
178	Thence North 67-12-28 West, a distance of 642.2768
179	Thence North 76-42-02 West, a distance of 627.0671
180	Thence North 60-32-28 West, a distance of 899.1237
181	Thence North 75-54-13 West, a distance of 665.1543
182	Thence North 66-23-19 West, a distance of 665.0515
183	Thence North 80-51-29 West, a distance of 459.4613
184	Thence North 74-27-13 West, a distance of 669.4943
185	Thence North 63-02-06 West, a distance of 312.4704
186	Thence North 73-53-13 West, a distance of 580.5569
187	Thence North 76-51-43 West, a distance of 555.1563
188	Thence North 72-03-23 West, a distance of 347.9228
189	Thence North 71-08-13 West, a distance of 497.2030
190	Thence North 69-01-58 West, a distance of 746.1565
191	Thence North 46-26-06 West, a distance of 382.9739
192	Thence North 55-28-34 West, a distance of 654.0611
193	Thence North 65-37-13 West, a distance of 516.0126
194	Thence North 73-38-41 West, a distance of 508.7107
195	Thence North 70-36-46 West, a distance of 591.0123
196	Thence North 69-01-55 West, a distance of 447.6429
197	Thence North 64-48-32 West, a distance of 1750.7575
198	Thence North 68-24-13 West, a distance of 917.8053
199	Thence North 68-02-33 West, a distance of 1427.2827
200	Thence North 64-07-22 West, a distance of 1625.0677
201	Thence North 43-46-42 West, a distance of 876.7911
202	Thence North 47-49-40 West, a distance of 655.7561
203	Thence North 61-41-57 West, a distance of 335.8997
204	Thence North 51-42-49 West, a distance of 199.2231
205	Thence North 48-40-34 West, a distance of 346.7099
206	Thence North 47-34-33 West, a distance of 235.0408
207	Thence North 36-26-36 West, a distance of 174.6548
208	Thence North 09-53-20 East, a distance of 106.2668
209	Thence South 78-41-19 East, a distance of 462.3561
210	Thence South 74-50-24 East, a distance of 343.1933
211	Thence South 79-53-51 East, a distance of 726.5141
212	Thence South 82-28-31 East, a distance of 422.3874
213	Thence North 74-29-44 East, a distance of 254.3821
214	Thence North 67-11-37 East, a distance of 399.0744
215	Thence North 60-41-37 East, a distance of 281.6756
216	Thence North 79-05-27 East, a distance of 445.1700
217	Thence North 00-26-51 East, a distance of 192.0059
218	Thence North 31-36-58 West, a distance of 164.7668
219	Thence North 80-07-13 West, a distance of 637.4534
220	Thence North 79-17-00 West, a distance of 585.8427
221	Thence North 83-52-06 West, a distance of 702.1421
222	Thence North 81-40-22 West, a distance of 634.8176
223	Thence North 71-46-52 West, a distance of 513.7552
224	Thence North 78-48-11 West, a distance of 746.7136

Exhibit C – Description of the Basin

225	Thence North 70-26-56 West, a distance of 905.9868
226	Thence North 65-52-49 West, a distance of 2823.3710
227	Thence North 52-03-27 West, a distance of 1519.7285
228	Thence North 36-15-37 West, a distance of 1023.5333
229	Thence North 28-50-12 West, a distance of 1501.3573
230	Thence North 03-16-40 East, a distance of 699.5825
231	Thence North 40-00-38 East, a distance of 657.5376
232	Thence North 55-55-24 East, a distance of 339.1029
233	Thence North 56-42-53 East, a distance of 377.8643
234	Thence North 26-59-25 East, a distance of 312.6105
235	Thence North 71-58-47 East, a distance of 497.0045
236	Thence North 80-06-42 East, a distance of 585.9547
237	Thence South 87-23-25 East, a distance of 454.3462
238	Thence North 42-41-35 East, a distance of 519.3043
239	Thence North 65-30-29 East, a distance of 539.2736
240	Thence North 85-13-27 East, a distance of 192.9198
241	Thence South 77-48-22 East, a distance of 428.1601
242	Thence South 79-18-05 East, a distance of 195.2692
243	Thence North 69-51-14 East, a distance of 298.5136
244	Thence North 28-19-28 East, a distance of 335.9044
245	Thence North 31-22-11 East, a distance of 305.6825
246	Thence North 56-01-15 East, a distance of 402.0238
247	Thence North 82-39-26 East, a distance of 387.8052
248	Thence North 78-08-24 East, a distance of 411.1519
249	Thence North 60-22-03 East, a distance of 383.3919
250	Thence North 59-26-14 East, a distance of 203.6705
251	Thence North 05-12-58 East, a distance of 210.3711
252	Thence North 54-35-53 West, a distance of 426.4772
253	Thence North 11-40-50 West, a distance of 250.0533
254	Thence North 49-48-05 East, a distance of 161.0345
255	Thence North 48-23-44 East, a distance of 235.0392
256	Thence North 00-24-37 East, a distance of 174.5675
257	Thence North 23-13-24 West, a distance of 304.9592
258	Thence North 70-45-15 East, a distance of 259.7676
259	Thence South 78-49-18 East, a distance of 373.3326
260	Thence South 72-19-46 East, a distance of 530.4007
261	Thence North 68-01-44 East, a distance of 321.0687
262	Thence North 61-21-05 East, a distance of 179.8988
263	Thence North 15-39-15 East, a distance of 199.2007
264	Thence North 00-24-37 East, a distance of 174.5675
265	Thence North 09-52-20 West, a distance of 195.3932
266	Thence North 38-41-05 West, a distance of 359.9806
267	Thence North 38-15-35 West, a distance of 335.4983
268	Thence North 24-47-03 West, a distance of 328.3020
269	Thence North 18-01-30 West, a distance of 220.9698
270	Thence North 00-27-21 East, a distance of 157.1300
271	Thence North 24-36-33 West, a distance of 289.0680
272	Thence North 26-08-49 West, a distance of 195.4380
273	Thence North 37-10-21 West, a distance of 286.5286
274	Thence North 71-10-31 West, a distance of 276.0141
275	Thence North 89-35-24 West, a distance of 366.7594
276	Thence North 47-18-37 West, a distance of 259.8516
277	Thence North 02-26-15 West, a distance of 349.7545
278	Thence North 02-27-48 West, a distance of 125.0526
279	Thence North 02-27-50 West, a distance of 78.5106
280	Thence North 02-27-01 West, a distance of 146.1957

Exhibit C – Description of the Basin

281	Thence North 05-17-26 West, a distance of 351.1208
282	Thence North 29-50-24 West, a distance of 242.6743
283	Thence North 87-54-29 West, a distance of 594.1460
284	Thence South 25-25-45 West, a distance of 289.0690
285	Thence South 07-33-35 West, a distance of 54.1577
286	Thence South 07-31-36 West, a distance of 368.3617
287	Thence South 15-40-43 West, a distance of 398.2550
288	Thence South 21-34-12 West, a distance of 580.7325
289	Thence South 17-07-05 West, a distance of 546.9813
290	Thence South 18-03-11 West, a distance of 403.3575
291	Thence South 25-37-23 West, a distance of 328.0751
292	Thence South 34-42-09 West, a distance of 465.0331
293	Thence South 25-01-48 West, a distance of 461.1868
294	Thence South 54-23-57 West, a distance of 475.1916
295	Thence South 69-37-52 West, a distance of 541.7496
296	Thence North 73-56-54 West, a distance of 453.4280
297	Thence North 48-34-43 West, a distance of 532.4290
298	Thence North 28-23-07 West, a distance of 398.6121
299	Thence North 54-35-53 West, a distance of 426.4777
300	Thence North 16-41-42 West, a distance of 237.5764
301	Thence North 12-06-59 West, a distance of 322.1772
302	Thence North 33-16-47 West, a distance of 251.7194
303	Thence North 60-46-31 West, a distance of 398.7569
304	Thence North 40-31-06 West, a distance of 346.7031
305	Thence North 29-18-46 West, a distance of 281.6207
306	Thence North 31-34-49 West, a distance of 329.6291
307	Thence North 65-37-55 West, a distance of 344.1602
308	Thence North 33-16-48 West, a distance of 314.8173
309	Thence North 40-10-53 West, a distance of 160.9938
310	Thence South 48-09-08 West, a distance of 259.5913
311	Thence South 05-10-56 West, a distance of 210.3598
312	Thence South 01-52-06 East, a distance of 437.1073
313	Thence South 17-14-28 East, a distance of 403.1796
314	Thence South 16-17-52 East, a distance of 546.9801
315	Thence South 17-24-29 East, a distance of 513.9131
316	Thence South 44-35-54 East, a distance of 296.2405
317	Thence South 40-10-11 East, a distance of 322.2593
318	Thence South 35-07-29 East, a distance of 300.4644
319	Thence South 31-25-13 East, a distance of 596.0948
320	Thence South 27-28-50 East, a distance of 335.9003
321	Thence South 04-21-44 East, a distance of 210.3594
322	Thence South 42-01-35 West, a distance of 210.4263
323	Thence South 45-23-50 West, a distance of 197.5089
324	Thence South 52-08-16 West, a distance of 422.9006
325	Thence South 45-24-36 West, a distance of 469.3541
326	Thence South 70-25-56 West, a distance of 408.8638
327	Thence South 66-59-15 West, a distance of 571.0711
328	Thence South 33-18-10 West, a distance of 353.7851
329	Thence South 37-17-32 West, a distance of 349.2845
330	Thence South 49-29-46 West, a distance of 346.7099
331	Thence South 65-13-51 West, a distance of 328.1924
332	Thence South 55-43-12 West, a distance of 276.0820
333	Thence South 59-26-46 West, a distance of 407.4482
334	Thence South 55-41-57 West, a distance of 385.3996
335	Thence South 74-49-34 West, a distance of 746.6568
336	Thence South 88-29-17 West, a distance of 502.1748

Exhibit C – Description of the Basin

337 Thence North 70-28-56 West, a distance of 460.1936
338 Thence North 69-36-20 West, a distance of 783.2207
339 Thence North 43-33-28 West, a distance of 939.4676
340 Thence South 90-00-00 East, a distance of 0.0000
341 to the point of beginning.
342
343
344 Perimeter: 140686.1563
345
346 Area: 191218952.8402 4389.7831 acres

Exhibit C – Description of the Basin
(Continued)

Legal Description for Intake Sub-basin

Beginning at a point lying North 03-03-37 East, a distance
of 8693.42 feet from the north one quarter corner of Section
7, Township 5 South, Range 1 East, S.B.B. & M.:

Thence North 43-33-19 West, a distance of 1036.0201
Thence North 40-54-46 West, a distance of 2583.7541
Thence North 31-11-35 West, a distance of 1531.8376
Thence North 29-04-17 West, a distance of 883.9252
Thence North 09-00-43 East, a distance of 1454.7700
Thence North 54-11-24 West, a distance of 779.7834
Thence North 87-31-53 West, a distance of 469.5258
Thence South 14-02-10 West, a distance of 1192.3299
Thence South 19-44-49 West, a distance of 1658.1895
Thence South 20-33-22 West, a distance of 1709.5454
Thence South 30-34-45 West, a distance of 1022.5993
Thence South 37-11-05 West, a distance of 1456.6566
Thence South 37-20-58 West, a distance of 1912.8988
Thence South 36-19-37 West, a distance of 1688.8119
Thence South 47-17-26 West, a distance of 1415.9609
Thence South 51-20-25 West, a distance of 1024.9459
Thence South 62-35-33 West, a distance of 1217.0825
Thence South 67-50-01 West, a distance of 1166.6981
Thence South 53-21-57 West, a distance of 2545.3471
Thence South 51-32-23 East, a distance of 1521.6193
Thence South 52-06-41 East, a distance of 3640.2127
Thence South 54-16-42 East, a distance of 2832.0686
Thence South 54-45-45 East, a distance of 8093.9477
Thence South 66-45-32 East, a distance of 1985.2225
Thence South 63-00-45 East, a distance of 1076.6119
Thence South 57-44-44 East, a distance of 10768.6202
Thence South 52-42-56 East, a distance of 2888.8756
Thence South 55-53-51 East, a distance of 6249.5878
Thence South 52-42-56 East, a distance of 2888.8756
Thence South 53-45-11 East, a distance of 2138.0014
Thence South 64-43-22 East, a distance of 2206.1030
Thence North 46-42-44 West, a distance of 156.7825
Thence North 44-35-15 West, a distance of 405.2711
Thence North 46-18-48 West, a distance of 669.1426
Thence North 37-52-35 West, a distance of 693.8574
Thence North 34-17-42 West, a distance of 906.2395
Thence North 33-57-07 West, a distance of 659.8059
Thence North 44-35-16 West, a distance of 608.0830
Thence North 46-47-40 West, a distance of 1054.3274
Thence North 48-19-10 West, a distance of 1868.4824
Thence North 56-06-31 West, a distance of 2130.4779
Thence North 66-07-44 West, a distance of 1655.6256
Thence North 58-12-53 West, a distance of 1376.2780
Thence North 41-24-29 West, a distance of 730.8163
Thence North 41-13-30 West, a distance of 345.0212
Thence North 26-08-55 West, a distance of 384.6138
Thence North 13-37-46 West, a distance of 354.3535
Thence North 41-34-35 West, a distance of 385.5755
Thence North 42-50-20 West, a distance of 669.1777

(Continued)

to the point of beginning.

Perimeter: 115214.4657

Area: 308717524.7511 7087.1792 acres

Exhibit D - Map of the Soboba Reservation

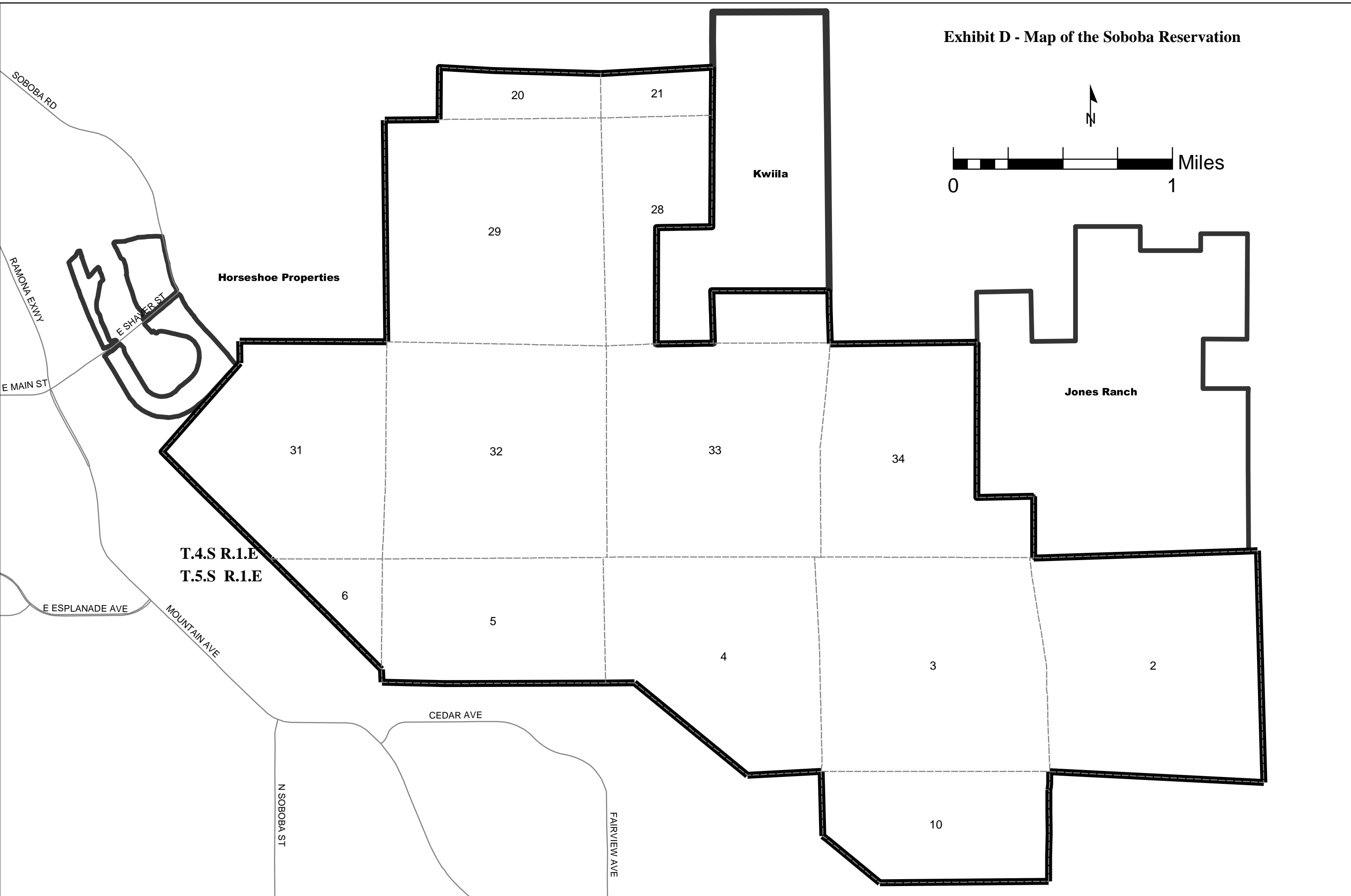


Exhibit E – Principles for Water Management

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

Exhibit E – Principles for Water Management

“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.

Exhibit E – Principles for Water Management

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

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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

Exhibit E – Principles for Water Management

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:

Exhibit E – Principles for Water Management

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

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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).

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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).

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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;

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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.

Exhibit E – Principles for Water Management

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: _____, 2004.

**EASTERN MUNICIPAL WATER
DISTRICT**

By: _____

Exhibit E – Principles for Water Management

Dated: _____, 2004.

LAKE HEMET MUNICIPAL WATER
DISTRICT

By: _____

Dated: _____, 2004.

CITY OF HEMET

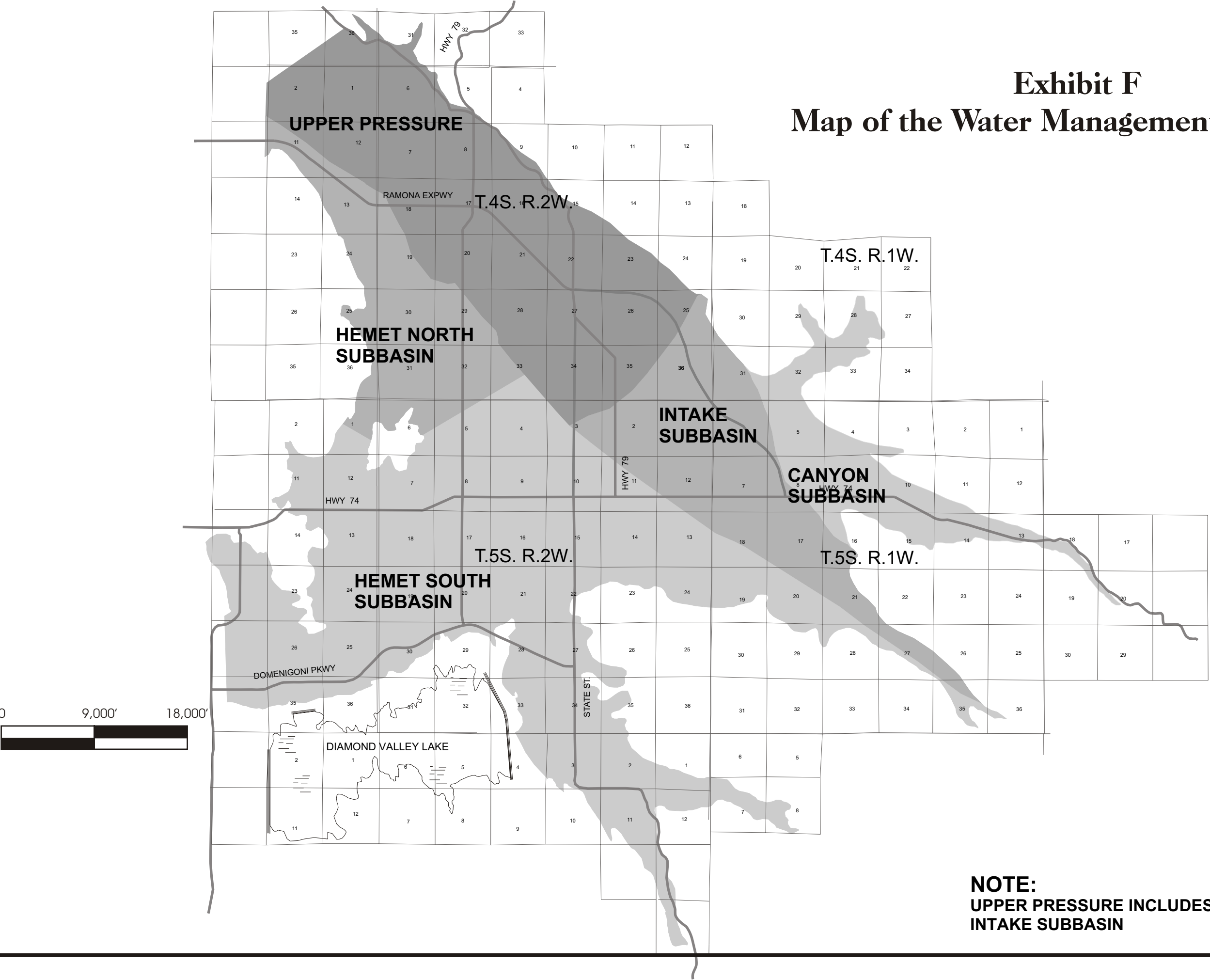
By: _____

Dated: _____, 2004.

CITY OF SAN JACINTO

By: _____

Exhibit F
Map of the Water Management Plan Area



NOTE:
UPPER PRESSURE INCLUDES
INTAKE SUBBASIN



1"=9,000'
06-02-2004

Exhibit G – Description of the Water Management Plan Area

Water Management Plan Area

Beginning at the North quarter Corner of Section 2, Township
4 South, Range 2 West, S.B.B.& M.:

Thence South 55-09-46 West, a distance of 3086.02
to the True Point of Beginning;

Thence South 01-57-57 West, a distance of 3159.1491
Thence South 00-29-02 West, a distance of 429.3273
Thence South 00-14-26 West, a distance of 1908.6588
Thence South 01-46-37 West, a distance of 1567.6119
Thence North 55-21-31 East, a distance of 446.8379
Thence North 26-23-15 East, a distance of 631.4127
Thence South 87-18-21 East, a distance of 191.4616
Thence South 87-17-52 East, a distance of 446.7468
Thence South 70-03-12 East, a distance of 419.5431
Thence South 48-59-17 East, a distance of 352.6834
Thence South 49-46-27 East, a distance of 298.9505
Thence South 38-14-56 East, a distance of 408.2682
Thence South 43-41-06 East, a distance of 568.0886
Thence South 33-24-04 East, a distance of 907.5881
Thence South 39-40-04 East, a distance of 681.4619
Thence South 44-35-36 East, a distance of 523.0954
Thence South 40-05-37 East, a distance of 805.0741
Thence South 37-55-01 East, a distance of 359.8351
Thence South 35-20-31 East, a distance of 531.5890
Thence South 22-00-05 East, a distance of 405.3986
Thence South 17-22-41 East, a distance of 504.7266
Thence South 25-17-32 East, a distance of 595.1082
Thence South 32-14-23 East, a distance of 575.2528
Thence South 38-11-56 East, a distance of 414.9866
Thence South 21-26-59 East, a distance of 691.8554
Thence South 22-44-15 East, a distance of 524.2415
Thence South 20-38-45 East, a distance of 573.2541
Thence South 32-15-39 East, a distance of 191.7948
Thence South 88-14-08 East, a distance of 156.3241
Thence South 46-34-05 East, a distance of 439.2778
Thence South 12-36-58 East, a distance of 409.7686
Thence South 18-19-44 East, a distance of 426.9082
Thence South 16-24-51 East, a distance of 572.8471
Thence South 22-07-10 East, a distance of 731.9991
Thence South 22-31-31 East, a distance of 720.1255
Thence South 22-41-43 East, a distance of 1039.9629
Thence South 38-30-56 East, a distance of 426.1504
Thence South 37-08-43 East, a distance of 350.8795
Thence South 35-21-27 East, a distance of 265.6921
Thence South 00-21-06 West, a distance of 692.3260
Thence South 09-53-35 East, a distance of 427.7983
Thence South 14-00-56 East, a distance of 460.9092
Thence South 00-49-47 East, a distance of 353.9741
Thence South 39-14-44 West, a distance of 334.1122
Thence North 88-16-13 West, a distance of 312.6425
Thence North 88-15-40 West, a distance of 327.5258

Exhibit G – Description of the Water Management Plan Area

Thence South 65-20-48 West, a distance of 211.1187
Thence South 51-19-16 West, a distance of 262.9182
Thence North 81-25-48 West, a distance of 270.5204
Thence North 00-23-36 East, a distance of 254.9440
Thence North 14-20-10 West, a distance of 196.8810
Thence North 69-38-37 West, a distance of 331.8501
Thence North 88-16-15 West, a distance of 312.7674
Thence South 45-39-54 West, a distance of 220.8974
Thence South 00-40-33 West, a distance of 158.9491
Thence South 08-40-14 West, a distance of 373.9607
Thence South 18-56-44 West, a distance of 166.3231
Thence South 13-04-14 East, a distance of 219.4350
Thence South 88-17-54 East, a distance of 208.3419
Thence South 52-36-50 East, a distance of 454.9685
Thence South 57-10-41 East, a distance of 307.7555
Thence South 10-23-15 East, a distance of 271.0676
Thence South 47-38-04 East, a distance of 488.4199
Thence South 38-59-11 East, a distance of 489.7587
Thence South 43-18-04 East, a distance of 225.0918
Thence South 36-19-43 East, a distance of 1211.7791
Thence South 00-40-32 West, a distance of 159.0111
Thence South 15-40-02 East, a distance of 555.4493
Thence South 32-13-48 East, a distance of 383.6829
Thence South 34-03-33 East, a distance of 457.3251
Thence South 06-55-29 West, a distance of 478.9941
Thence South 11-48-53 West, a distance of 538.4695
Thence South 04-00-47 East, a distance of 639.4428
Thence South 57-16-59 West, a distance of 374.5463
Thence South 59-59-38 West, a distance of 302.6944
Thence South 45-44-02 West, a distance of 220.8122
Thence South 40-23-23 West, a distance of 407.4181
Thence South 27-02-10 West, a distance of 234.5719
Thence South 18-54-48 West, a distance of 499.3999
Thence South 18-54-28 West, a distance of 332.9008
Thence South 08-40-29 West, a distance of 373.7759
Thence South 11-49-45 West, a distance of 538.4344
Thence South 00-40-31 West, a distance of 318.1471
Thence South 00-39-43 West, a distance of 530.0974
Thence South 30-14-06 West, a distance of 422.2534
Thence South 31-26-41 West, a distance of 305.2671
Thence South 77-24-27 West, a distance of 214.1513
Thence North 25-17-38 West, a distance of 238.1444
Thence South 35-31-17 West, a distance of 637.9021
Thence South 39-15-19 West, a distance of 169.0961
Thence South 39-13-20 West, a distance of 165.0641
Thence South 39-14-20 West, a distance of 668.3212
Thence South 30-15-45 West, a distance of 422.1539
Thence South 06-16-29 West, a distance of 531.8110
Thence South 18-55-03 West, a distance of 166.5596
Thence South 21-01-01 West, a distance of 449.2623
Thence South 27-03-08 West, a distance of 351.8017
Thence South 31-28-15 West, a distance of 305.2794
Thence South 45-41-33 West, a distance of 515.4747
Thence South 77-23-51 West, a distance of 642.2232
Thence South 85-54-45 West, a distance of 522.5793
Thence North 82-59-20 West, a distance of 576.5611

Exhibit G – Description of the Water Management Plan Area

Thence North 64-53-25 West, a distance of 400.6090
Thence North 66-16-35 West, a distance of 566.0858
Thence North 38-59-11 West, a distance of 489.7595
Thence North 32-14-03 West, a distance of 383.4039
Thence North 20-39-20 West, a distance of 286.6781
Thence North 43-18-43 West, a distance of 225.0460
Thence South 18-53-52 West, a distance of 166.3412
Thence North 88-17-24 West, a distance of 416.8106
Thence South 04-55-55 East, a distance of 533.6007
Thence South 51-18-38 East, a distance of 264.5584
Thence South 16-03-15 East, a distance of 723.6602
Thence South 34-10-30 West, a distance of 188.4831
Thence South 37-27-05 West, a distance of 261.0635
Thence South 06-18-55 East, a distance of 428.4127
Thence South 00-40-32 West, a distance of 371.0878
Thence South 66-17-12 East, a distance of 283.1573
Thence South 54-26-34 East, a distance of 380.8999
Thence South 18-53-51 West, a distance of 499.4190
Thence South 32-15-38 East, a distance of 191.7957
Thence South 14-32-01 West, a distance of 434.8520
Thence South 17-11-06 West, a distance of 549.9921
Thence South 31-27-03 West, a distance of 305.2142
Thence South 60-02-12 West, a distance of 302.7087
Thence South 60-45-52 West, a distance of 721.1047
Thence South 83-27-27 West, a distance of 367.5184
Thence South 57-14-27 West, a distance of 374.5758
Thence South 20-39-20 East, a distance of 286.6781
Thence South 88-16-51 East, a distance of 312.5156
Thence South 25-17-24 East, a distance of 476.0654
Thence South 57-08-56 East, a distance of 307.8569
Thence North 50-10-17 East, a distance of 479.5142
Thence North 29-05-00 East, a distance of 656.5286
Thence South 34-02-30 East, a distance of 457.5323
Thence South 17-22-42 East, a distance of 168.2415
Thence South 00-40-33 West, a distance of 158.9491
Thence South 60-02-12 West, a distance of 302.7087
Thence South 00-40-31 West, a distance of 371.2758
Thence South 67-32-00 East, a distance of 448.9489
Thence South 64-52-57 East, a distance of 400.4958
Thence North 71-51-49 East, a distance of 481.6809
Thence South 89-35-03 East, a distance of 344.3841
Thence South 46-25-17 East, a distance of 279.7030
Thence South 03-10-14 East, a distance of 409.0632
Thence South 23-51-22 West, a distance of 416.9340
Thence South 03-24-06 East, a distance of 383.4255
Thence South 66-09-28 East, a distance of 498.9547
Thence North 61-17-01 East, a distance of 418.4674
Thence North 62-31-22 East, a distance of 424.9349
Thence South 60-02-46 East, a distance of 439.7373
Thence South 24-58-10 East, a distance of 414.5596
Thence South 33-07-02 East, a distance of 260.1327
Thence South 34-34-28 East, a distance of 318.9559
Thence South 18-21-02 East, a distance of 308.8960
Thence South 13-34-41 West, a distance of 413.1727
Thence South 42-19-37 West, a distance of 343.9836
Thence South 63-55-07 West, a distance of 198.5981

Exhibit G – Description of the Water Management Plan Area

Thence North 85-31-13 West, a distance of 366.4946
Thence North 76-58-32 West, a distance of 406.8413
Thence North 72-11-08 West, a distance of 279.2651
Thence South 48-26-06 West, a distance of 204.3228
Thence South 34-26-55 West, a distance of 484.3828
Thence South 07-01-37 West, a distance of 389.2991
Thence South 05-32-54 East, a distance of 480.9402
Thence South 47-03-44 East, a distance of 682.8003
Thence South 21-46-09 East, a distance of 371.7621
Thence South 02-53-33 East, a distance of 483.0534
Thence South 14-20-24 West, a distance of 531.9487
Thence South 35-28-25 West, a distance of 663.8471
Thence South 52-23-59 West, a distance of 364.7668
Thence South 08-13-01 East, a distance of 698.7991
Thence South 67-31-20 East, a distance of 449.3910
Thence South 25-24-05 East, a distance of 238.0781
Thence South 22-14-37 West, a distance of 282.6599
Thence South 22-16-19 West, a distance of 282.6499
Thence South 26-41-31 East, a distance of 328.3674
Thence South 08-00-01 East, a distance of 374.5201
Thence South 00-14-32 West, a distance of 295.8146
Thence South 22-50-30 East, a distance of 524.2347
Thence South 32-19-47 East, a distance of 135.8012
Thence South 74-41-41 East, a distance of 495.5765
Thence North 87-48-16 East, a distance of 230.0439
Thence South 62-02-24 East, a distance of 271.0081
Thence South 27-01-09 East, a distance of 158.7654
Thence South 00-25-08 West, a distance of 188.1300
Thence South 47-28-36 West, a distance of 306.8174
Thence South 67-08-04 West, a distance of 1017.9951
Thence South 88-16-15 West, a distance of 559.2547
Thence North 38-00-54 West, a distance of 199.5152
Thence North 01-24-06 West, a distance of 209.4997
Thence North 29-50-03 West, a distance of 268.0941
Thence North 58-00-46 West, a distance of 880.2816
Thence North 18-49-54 East, a distance of 131.2772
Thence North 41-46-48 East, a distance of 881.2088
Thence North 53-22-34 East, a distance of 244.5273
Thence North 12-17-03 East, a distance of 196.8192
Thence North 32-10-09 West, a distance of 185.4739
Thence North 63-33-01 West, a distance of 250.0488
Thence North 87-33-20 West, a distance of 561.2607
Thence North 66-33-29 West, a distance of 616.6454
Thence North 08-43-43 East, a distance of 216.6340
Thence North 67-39-56 East, a distance of 702.4460
Thence North 35-11-58 East, a distance of 228.9973
Thence North 05-39-39 West, a distance of 221.7695
Thence North 52-37-23 West, a distance of 454.7550
Thence North 70-59-03 West, a distance of 713.5651
Thence North 88-13-32 West, a distance of 260.3749
Thence North 81-50-24 West, a distance of 472.9131
Thence North 46-37-10 West, a distance of 638.0651
Thence North 43-16-43 West, a distance of 300.1255
Thence North 38-12-54 West, a distance of 414.8389
Thence North 17-22-30 West, a distance of 336.5442
Thence North 15-44-09 East, a distance of 601.0252

Exhibit G – Description of the Water Management Plan Area

Thence North 17-21-42 West, a distance of 673.1694
Thence North 20-38-46 West, a distance of 573.2531
Thence North 18-52-30 West, a distance of 622.8685
Thence South 60-02-48 West, a distance of 302.6778
Thence North 69-38-36 West, a distance of 331.8504
Thence South 60-02-48 West, a distance of 302.6778
Thence North 43-18-30 West, a distance of 675.1831
Thence North 32-14-42 West, a distance of 383.5238
Thence North 57-09-25 West, a distance of 615.5074
Thence South 80-11-19 West, a distance of 529.6212
Thence South 86-26-44 West, a distance of 574.6054
Thence North 35-20-05 West, a distance of 531.4653
Thence North 00-38-55 East, a distance of 265.0170
Thence North 67-31-12 West, a distance of 448.8571
Thence South 88-18-10 West, a distance of 886.2638
Thence South 60-46-39 West, a distance of 721.0129
Thence South 45-41-01 West, a distance of 589.1057
Thence South 14-55-27 East, a distance of 387.3153
Thence South 00-40-32 West, a distance of 371.0888
Thence South 13-04-27 East, a distance of 438.7482
Thence South 21-26-38 East, a distance of 692.0304
Thence South 46-37-24 East, a distance of 638.0219
Thence South 47-03-19 East, a distance of 563.1754
Thence South 14-56-23 East, a distance of 387.4074
Thence South 23-12-42 East, a distance of 643.1882
Thence South 28-23-55 East, a distance of 428.9302
Thence South 14-56-32 East, a distance of 387.3475
Thence South 08-36-11 East, a distance of 323.3886
Thence South 04-55-55 East, a distance of 533.6007
Thence South 13-03-12 East, a distance of 205.8819
Thence South 09-36-40 East, a distance of 902.1630
Thence South 33-16-14 East, a distance of 321.9605
Thence South 36-27-41 West, a distance of 173.5290
Thence South 58-28-58 West, a distance of 639.1622
Thence South 01-42-32 East, a distance of 8216.1537
Thence North 78-59-47 East, a distance of 87.1013
Thence South 88-12-52 East, a distance of 469.3529
Thence South 74-02-23 East, a distance of 432.5486
Thence South 69-39-25 East, a distance of 664.8422
Thence South 88-10-48 East, a distance of 208.6052
Thence South 69-38-45 East, a distance of 498.6348
Thence South 82-26-13 East, a distance of 525.1939
Thence North 80-15-12 East, a distance of 265.0761
Thence South 69-37-59 East, a distance of 332.4062
Thence North 80-15-12 East, a distance of 265.0761
Thence North 61-21-31 East, a distance of 418.1679
Thence North 78-16-23 East, a distance of 907.4410
Thence South 79-58-51 East, a distance of 370.0179
Thence North 82-08-20 East, a distance of 316.2216
Thence North 55-40-58 East, a distance of 239.1251
Thence North 32-41-32 East, a distance of 260.8180
Thence North 87-54-28 East, a distance of 267.0530
Thence South 74-39-09 East, a distance of 360.3507
Thence South 81-59-59 East, a distance of 351.1678
Thence South 85-51-12 East, a distance of 535.0256
Thence North 74-27-22 East, a distance of 253.5225

Exhibit G – Description of the Water Management Plan Area

Thence North 68-04-45 East, a distance of 405.9771
Thence North 72-57-30 East, a distance of 164.2103
Thence North 68-40-29 East, a distance of 674.5618
Thence South 88-12-52 East, a distance of 469.3529
Thence North 84-02-19 East, a distance of 787.1317
Thence North 57-20-59 East, a distance of 187.2075
Thence North 72-57-06 East, a distance of 328.3010
Thence North 89-27-22 East, a distance of 1303.8087
Thence North 69-30-36 East, a distance of 279.4284
Thence North 55-24-17 East, a distance of 446.5897
Thence North 77-27-37 East, a distance of 428.3428
Thence North 57-20-59 East, a distance of 187.2075
Thence North 68-40-15 East, a distance of 674.4450
Thence North 54-02-04 East, a distance of 259.7702
Thence North 61-32-05 West, a distance of 236.0350
Thence North 11-48-13 East, a distance of 268.8725
Thence North 74-44-23 East, a distance of 542.1152
Thence North 79-01-23 East, a distance of 478.8868
Thence North 72-58-07 East, a distance of 328.4024
Thence North 39-15-47 East, a distance of 333.7907
Thence North 18-52-51 East, a distance of 332.5833
Thence North 77-29-05 East, a distance of 428.3020
Thence South 64-07-57 East, a distance of 518.8621
Thence South 88-12-19 East, a distance of 365.1791
Thence North 57-18-33 East, a distance of 748.5774
Thence North 30-13-53 East, a distance of 421.8035
Thence North 50-13-44 East, a distance of 479.1141
Thence North 27-01-48 East, a distance of 351.2419
Thence North 69-48-55 East, a distance of 347.5974
Thence North 73-52-54 East, a distance of 276.2335
Thence North 64-10-01 East, a distance of 564.5414
Thence North 48-25-39 East, a distance of 770.2680
Thence North 02-42-04 West, a distance of 363.4037
Thence North 07-15-13 East, a distance of 494.0156
Thence South 82-00-37 East, a distance of 544.5357
Thence North 23-34-36 East, a distance of 248.7655
Thence North 08-21-28 West, a distance of 257.9899
Thence North 12-57-56 West, a distance of 211.7095
Thence North 39-05-14 East, a distance of 188.3414
Thence South 59-36-44 East, a distance of 294.3064
Thence South 29-40-15 East, a distance of 384.3301
Thence North 77-27-50 East, a distance of 214.2324
Thence South 37-11-16 East, a distance of 340.4048
Thence South 29-37-50 East, a distance of 310.4751
Thence North 63-11-55 East, a distance of 298.2940
Thence North 54-27-48 East, a distance of 484.6434
Thence North 53-19-04 East, a distance of 504.0777
Thence North 70-16-43 East, a distance of 313.3817
Thence North 68-19-13 East, a distance of 338.7091
Thence South 79-55-46 East, a distance of 321.3256
Thence South 88-11-10 East, a distance of 260.6306
Thence South 88-14-05 East, a distance of 365.1733
Thence South 61-32-01 East, a distance of 235.8955
Thence South 69-37-59 East, a distance of 332.4058
Thence South 71-22-52 East, a distance of 548.3222
Thence South 13-09-09 East, a distance of 219.1868

Exhibit G – Description of the Water Management Plan Area

Thence South 22-05-36 East, a distance of 405.4599
Thence South 35-25-24 East, a distance of 265.9093
Thence South 61-31-13 East, a distance of 235.9251
Thence North 09-57-27 East, a distance of 320.9599
Thence North 12-08-01 West, a distance of 709.4744
Thence North 05-00-10 West, a distance of 533.2184
Thence North 31-28-03 East, a distance of 304.8291
Thence North 62-04-26 East, a distance of 534.2079
Thence North 76-04-08 East, a distance of 380.0540
Thence North 50-36-14 East, a distance of 898.3854
Thence South 60-30-43 East, a distance of 295.9651
Thence South 09-03-18 East, a distance of 874.4608
Thence South 42-03-39 West, a distance of 1049.7552
Thence South 33-04-47 East, a distance of 305.9692
Thence South 00-25-20 West, a distance of 424.0115
Thence South 08-41-25 West, a distance of 175.3885
Thence South 18-57-27 West, a distance of 88.8830
Thence South 00-37-56 West, a distance of 158.5727
Thence South 02-24-11 West, a distance of 420.3696
Thence South 10-51-56 West, a distance of 218.1612
Thence South 23-17-39 West, a distance of 1081.6711
Thence South 22-14-55 West, a distance of 282.6016
Thence South 09-56-34 West, a distance of 642.1445
Thence South 00-36-30 West, a distance of 423.7739
Thence South 05-36-43 East, a distance of 480.6166
Thence South 34-07-27 East, a distance of 457.6755
Thence South 43-22-35 East, a distance of 525.6352
Thence South 43-21-59 East, a distance of 468.2066
Thence South 86-51-47 East, a distance of 194.1659
Thence North 13-02-05 West, a distance of 207.2779
Thence North 31-29-15 East, a distance of 304.8943
Thence South 28-28-33 East, a distance of 429.1724
Thence South 00-37-56 West, a distance of 101.9432
Thence South 00-34-18 West, a distance of 162.8831
Thence South 79-04-14 West, a distance of 215.9165
Thence South 16-16-25 East, a distance of 365.7800
Thence South 29-40-24 East, a distance of 310.3196
Thence South 00-36-30 West, a distance of 211.8869
Thence South 11-46-39 West, a distance of 268.8469
Thence South 34-06-24 East, a distance of 457.6575
Thence South 32-18-47 East, a distance of 383.7376
Thence South 05-00-57 East, a distance of 533.2921
Thence South 18-52-51 West, a distance of 332.5833
Thence South 34-14-57 West, a distance of 564.8157
Thence South 62-30-45 West, a distance of 350.7168
Thence South 27-53-02 East, a distance of 1292.0070
Thence South 26-38-27 East, a distance of 844.3959
Thence South 35-16-45 East, a distance of 1398.9888
Thence South 43-11-11 East, a distance of 1392.1514
Thence South 42-14-40 East, a distance of 491.7866
Thence North 45-24-07 East, a distance of 151.1478
Thence South 77-29-31 East, a distance of 410.3647
Thence South 18-02-51 East, a distance of 181.1631
Thence South 39-21-33 East, a distance of 223.9113
Thence South 33-18-20 East, a distance of 206.6998
Thence South 00-25-39 West, a distance of 167.5677

Exhibit G – Description of the Water Management Plan Area

Thence South 54-42-30 East, a distance of 111.6424
Thence South 50-39-25 East, a distance of 838.8686
Thence North 11-47-14 West, a distance of 130.9483
Thence North 07-43-40 West, a distance of 202.6535
Thence North 00-24-22 East, a distance of 229.3178
Thence North 00-25-00 East, a distance of 171.8795
Thence North 37-17-40 East, a distance of 143.3793
Thence South 83-52-17 East, a distance of 288.0212
Thence South 35-07-26 East, a distance of 246.5899
Thence South 57-35-35 East, a distance of 270.2065
Thence South 66-24-50 East, a distance of 218.3676
Thence South 84-22-46 East, a distance of 316.5217
Thence South 67-45-17 East, a distance of 154.3641
Thence South 60-13-50 East, a distance of 526.0466
Thence South 30-34-27 East, a distance of 334.2156
Thence South 20-07-23 East, a distance of 244.8868
Thence South 21-23-16 East, a distance of 463.0777
Thence South 26-09-54 East, a distance of 192.1947
Thence South 37-28-06 East, a distance of 326.7182
Thence South 31-11-18 East, a distance of 437.6249
Thence South 36-28-24 East, a distance of 429.8103
Thence South 32-03-48 East, a distance of 373.6888
Thence South 38-14-10 East, a distance of 366.9793
Thence South 26-09-29 East, a distance of 448.5666
Thence South 26-08-48 East, a distance of 256.4284
Thence South 28-11-19 East, a distance of 359.0890
Thence South 27-53-11 East, a distance of 423.0643
Thence South 28-12-22 East, a distance of 359.1480
Thence South 32-03-30 East, a distance of 373.7422
Thence South 44-37-29 East, a distance of 80.9655
Thence North 18-52-20 East, a distance of 181.2433
Thence North 00-24-01 East, a distance of 143.1905
Thence North 14-50-58 West, a distance of 326.7890
Thence North 05-18-17 West, a distance of 287.9834
Thence North 00-24-59 East, a distance of 258.0698
Thence North 53-33-00 East, a distance of 143.2788
Thence North 84-41-51 East, a distance of 288.1079
Thence South 51-43-06 East, a distance of 326.7620
Thence South 44-34-21 East, a distance of 527.0298
Thence South 31-11-28 East, a distance of 437.3463
Thence South 33-58-56 East, a distance of 659.7382
Thence South 38-14-14 East, a distance of 550.5564
Thence South 63-00-06 East, a distance of 384.5311
Thence South 38-59-18 East, a distance of 1038.4843
Thence South 15-17-56 East, a distance of 952.6996
Thence South 55-56-23 East, a distance of 206.5605
Thence South 55-53-00 East, a distance of 516.8216
Thence South 38-53-16 East, a distance of 407.1779
Thence South 16-56-09 East, a distance of 1441.3852
Thence South 07-11-08 East, a distance of 433.7182
Thence South 21-02-16 East, a distance of 862.1560
Thence South 27-40-23 East, a distance of 487.1621
Thence South 26-09-29 East, a distance of 448.5666
Thence South 45-22-28 West, a distance of 81.1422
Thence South 06-42-29 East, a distance of 231.1453
Thence South 20-08-17 East, a distance of 244.7103

Exhibit G – Description of the Water Management Plan Area

Thence South 09-04-03 East, a distance of 174.4926
Thence South 09-02-24 East, a distance of 174.2271
Thence South 07-43-40 East, a distance of 202.6525
Thence South 00-24-00 West, a distance of 286.5700
Thence South 14-49-32 East, a distance of 326.8170
Thence South 00-24-00 West, a distance of 286.5070
Thence South 21-21-44 East, a distance of 154.4223
Thence South 13-37-15 East, a distance of 236.2051
Thence South 13-38-35 East, a distance of 236.3570
Thence South 15-31-50 East, a distance of 208.6814
Thence South 22-46-58 East, a distance of 218.2129
Thence South 22-46-35 East, a distance of 218.2700
Thence South 55-52-57 East, a distance of 206.7006
Thence South 78-16-53 East, a distance of 146.1716
Thence North 79-05-28 East, a distance of 292.2816
Thence North 74-28-54 East, a distance of 208.6048
Thence North 82-16-12 East, a distance of 202.5910
Thence South 89-35-39 East, a distance of 229.3808
Thence South 80-06-19 East, a distance of 174.2164
Thence North 22-12-54 East, a distance of 154.3976
Thence North 26-07-54 West, a distance of 192.1396
Thence North 36-27-45 West, a distance of 286.6826
Thence North 41-34-35 West, a distance of 385.5748
Thence North 26-08-54 West, a distance of 384.3343
Thence North 13-37-11 West, a distance of 354.5964
Thence North 24-22-44 West, a distance of 410.3376
Thence North 18-00-48 West, a distance of 362.5852
Thence North 12-07-44 West, a distance of 264.1464
Thence North 05-55-46 West, a distance of 519.0893
Thence North 00-24-59 East, a distance of 429.9494
Thence North 02-18-24 West, a distance of 602.4882
Thence North 02-04-24 West, a distance of 659.9320
Thence North 02-05-06 West, a distance of 659.6867
Thence North 25-08-41 West, a distance of 730.7479
Thence North 42-06-19 West, a distance of 466.4456
Thence North 19-15-13 West, a distance of 426.0813
Thence North 02-57-04 West, a distance of 488.0222
Thence North 00-24-41 East, a distance of 487.3876
Thence North 00-25-30 East, a distance of 286.5709
Thence North 19-34-09 West, a distance of 335.5043
Thence North 34-05-50 West, a distance of 556.3259
Thence North 22-12-56 West, a distance of 745.1916
Thence North 23-12-25 West, a distance of 500.5652
Thence North 06-43-37 West, a distance of 462.0560
Thence North 10-53-48 West, a distance of 292.2697
Thence North 00-25-22 East, a distance of 372.6971
Thence North 00-24-28 East, a distance of 544.3888
Thence North 00-24-21 East, a distance of 458.6995
Thence North 13-37-02 West, a distance of 472.5327
Thence North 16-18-14 West, a distance of 299.2196
Thence North 06-09-17 East, a distance of 287.9729
Thence North 63-49-21 East, a distance of 256.2870
Thence North 63-49-04 East, a distance of 192.3620
Thence South 89-35-15 East, a distance of 286.5074
Thence South 72-52-12 East, a distance of 299.4071
Thence South 36-27-54 East, a distance of 286.4572

Exhibit G – Description of the Water Management Plan Area

Thence South 63-00-19 East, a distance of 320.4094
Thence South 87-05-43 East, a distance of 659.8478
Thence South 87-18-26 East, a distance of 717.0418
Thence North 78-19-20 East, a distance of 410.3691
Thence North 86-20-49 East, a distance of 402.1922
Thence North 75-28-47 East, a distance of 444.9628
Thence North 68-35-42 East, a distance of 463.0656
Thence South 89-35-15 East, a distance of 573.1398
Thence North 74-30-26 East, a distance of 208.7087
Thence North 67-12-39 East, a distance of 218.1548
Thence North 40-38-39 East, a distance of 488.2085
Thence North 56-43-24 East, a distance of 309.9471
Thence North 82-49-48 East, a distance of 433.6411
Thence South 64-49-28 East, a distance of 410.3555
Thence South 79-35-09 East, a distance of 494.7756
Thence South 51-42-35 East, a distance of 326.8004
Thence South 67-19-51 East, a distance of 681.2553
Thence South 53-53-05 East, a distance of 1129.4102
Thence South 36-27-09 East, a distance of 573.2902
Thence South 69-38-11 East, a distance of 335.3323
Thence North 82-19-37 East, a distance of 202.6898
Thence North 75-09-58 East, a distance of 326.6362
Thence South 86-44-29 East, a distance of 573.9280
Thence South 44-35-15 East, a distance of 405.2711
Thence South 54-53-15 East, a distance of 453.2260
Thence South 26-08-48 East, a distance of 256.4275
Thence South 70-17-49 East, a distance of 607.3060
Thence South 72-29-09 East, a distance of 389.8210
Thence South 57-07-23 East, a distance of 373.7322
Thence South 78-17-20 East, a distance of 292.2079
Thence North 60-38-50 East, a distance of 231.0356
Thence North 63-52-05 East, a distance of 192.2792
Thence North 63-50-06 East, a distance of 256.2596
Thence North 33-14-52 West, a distance of 103.2813
Thence North 73-39-56 West, a distance of 208.6728
Thence North 83-14-16 West, a distance of 259.5556
Thence North 83-52-07 West, a distance of 287.8969
Thence North 38-15-29 West, a distance of 183.7039
Thence North 31-36-33 West, a distance of 270.2132
Thence North 06-40-38 West, a distance of 231.1308
Thence North 31-21-38 East, a distance of 167.1723
Thence North 36-29-06 West, a distance of 286.5315
Thence North 52-43-48 West, a distance of 143.2535
Thence North 12-07-13 West, a distance of 264.3292
Thence North 00-26-14 East, a distance of 229.3817
Thence North 49-48-32 East, a distance of 264.1064
Thence North 63-50-04 East, a distance of 64.2044
Thence North 81-00-14 East, a distance of 174.2687
Thence North 37-17-40 East, a distance of 143.3793
Thence North 11-41-40 East, a distance of 146.1588
Thence North 00-22-29 East, a distance of 114.6895
Thence North 44-33-45 West, a distance of 162.1090
Thence North 54-04-38 West, a distance of 246.5087
Thence North 74-39-06 West, a distance of 444.8663
Thence North 55-53-48 West, a distance of 206.6659
Thence North 81-26-16 West, a distance of 202.7599

Exhibit G – Description of the Water Management Plan Area

Thence North 89-35-15 West, a distance of 286.5074
Thence South 60-39-45 West, a distance of 231.1446
Thence South 75-28-47 West, a distance of 444.9625
Thence South 84-04-11 West, a distance of 259.5139
Thence North 74-39-14 West, a distance of 889.8532
Thence North 37-28-30 West, a distance of 326.6682
Thence North 60-56-43 West, a distance of 359.0601
Thence North 51-42-35 West, a distance of 326.8004
Thence North 74-40-45 West, a distance of 444.9374
Thence North 78-16-36 West, a distance of 584.4413
Thence North 59-50-38 West, a distance of 462.3204
Thence North 41-12-16 West, a distance of 345.1619
Thence North 36-28-24 West, a distance of 429.8103
Thence North 44-33-45 West, a distance of 324.2179
Thence North 78-17-37 West, a distance of 292.3305
Thence North 82-27-35 West, a distance of 230.9974
Thence North 85-45-59 West, a distance of 430.9259
Thence North 74-51-11 West, a distance of 563.0613
Thence South 86-51-26 West, a distance of 459.4410
Thence South 66-26-36 West, a distance of 282.2731
Thence North 87-12-58 West, a distance of 688.4375
Thence North 66-44-39 West, a distance of 590.7479
Thence North 71-08-45 West, a distance of 815.7709
Thence North 61-17-05 West, a distance of 423.1666
Thence North 75-34-27 West, a distance of 472.6522
Thence North 86-00-24 West, a distance of 459.4906
Thence North 54-52-19 West, a distance of 453.1594
Thence North 77-03-58 West, a distance of 792.7378
Thence North 64-34-10 West, a distance of 474.3353
Thence North 69-21-42 West, a distance of 580.3709
Thence North 65-57-27 West, a distance of 500.4138
Thence North 48-24-23 West, a distance of 914.0925
Thence North 48-58-47 West, a distance of 528.5110
Thence North 26-09-15 West, a distance of 576.8086
Thence North 28-38-22 West, a distance of 294.9630
Thence North 05-55-05 West, a distance of 259.4447
Thence North 39-03-22 East, a distance of 183.5086
Thence North 08-32-50 East, a distance of 202.6892
Thence North 18-02-29 West, a distance of 181.2221
Thence North 44-34-49 West, a distance of 283.6904
Thence North 16-56-18 West, a distance of 480.5332
Thence North 26-57-57 East, a distance of 63.9531
Thence North 26-59-06 East, a distance of 320.3812
Thence North 00-24-56 East, a distance of 86.1903
Thence North 13-36-07 West, a distance of 117.9965
Thence North 55-53-15 West, a distance of 103.4197
Thence North 80-07-57 West, a distance of 348.6579
Thence South 83-19-15 West, a distance of 231.0682
Thence South 71-56-46 West, a distance of 181.3012
Thence North 89-35-15 West, a distance of 286.5074
Thence North 65-37-31 West, a distance of 282.2862
Thence North 21-24-19 West, a distance of 154.4679
Thence North 00-25-00 East, a distance of 257.8188
Thence North 50-35-45 East, a distance of 223.8940
Thence North 72-00-09 East, a distance of 362.4866
Thence North 77-51-49 East, a distance of 264.2818

Exhibit G – Description of the Water Management Plan Area

Thence North 51-44-27 East, a distance of 367.0951
Thence North 54-54-11 East, a distance of 246.4308
Thence North 56-41-40 East, a distance of 310.0497
Thence North 62-07-05 East, a distance of 423.2595
Thence North 06-43-28 East, a distance of 259.4095
Thence North 21-22-37 West, a distance of 617.2803
Thence North 23-33-48 West, a distance of 282.3551
Thence North 89-33-45 West, a distance of 114.6283
Thence North 89-35-22 West, a distance of 401.2603
Thence South 69-51-30 West, a distance of 244.8490
Thence South 60-09-01 West, a distance of 398.0591
Thence South 54-23-11 West, a distance of 389.9315
Thence South 54-22-33 West, a distance of 389.8293
Thence South 61-48-41 West, a distance of 359.0890
Thence South 84-03-32 West, a distance of 259.6446
Thence North 89-35-15 West, a distance of 286.5074
Thence North 57-07-23 West, a distance of 373.7322
Thence North 00-24-59 East, a distance of 258.0698
Thence North 30-40-48 East, a distance of 398.0960
Thence North 00-23-59 East, a distance of 143.3785
Thence North 18-00-35 West, a distance of 90.5622
Thence North 40-11-02 West, a distance of 264.2419
Thence North 65-07-41 West, a distance of 346.2386
Thence North 83-15-30 West, a distance of 519.0892
Thence North 44-35-39 West, a distance of 324.3934
Thence North 60-59-24 West, a distance of 359.0481
Thence North 30-30-56 West, a distance of 167.1519
Thence North 18-02-29 West, a distance of 362.4451
Thence North 00-25-00 East, a distance of 171.9425
Thence North 53-32-05 East, a distance of 286.7694
Thence North 79-07-22 East, a distance of 292.1233
Thence South 89-35-23 East, a distance of 200.6301
Thence South 84-48-57 East, a distance of 345.1619
Thence South 50-18-17 East, a distance of 407.2701
Thence South 44-36-07 East, a distance of 324.3485
Thence South 47-35-44 East, a distance of 385.4597
Thence South 47-57-26 East, a distance of 345.2181
Thence South 50-18-41 East, a distance of 407.2305
Thence South 65-07-08 East, a distance of 346.2647
Thence South 85-11-02 East, a distance of 373.6944
Thence South 89-35-12 East, a distance of 372.6347
Thence North 70-25-25 East, a distance of 335.3866
Thence North 67-14-11 East, a distance of 218.3853
Thence North 32-23-49 East, a distance of 270.3989
Thence North 00-24-59 East, a distance of 344.0091
Thence North 06-44-46 West, a distance of 230.9107
Thence North 37-17-40 East, a distance of 286.7579
Thence North 00-23-34 East, a distance of 200.5677
Thence North 00-23-58 East, a distance of 143.4405
Thence North 54-03-04 West, a distance of 493.0265
Thence North 79-16-58 West, a distance of 640.9295
Thence North 85-45-54 West, a distance of 430.8012
Thence North 74-20-13 West, a distance of 653.5178
Thence North 71-09-25 West, a distance of 543.7674
Thence North 53-33-23 West, a distance of 779.7344
Thence North 26-08-55 West, a distance of 768.9482

Exhibit G – Description of the Water Management Plan Area

Thence North 21-24-02 West, a distance of 617.3128
Thence North 04-14-31 East, a distance of 430.9305
Thence North 42-24-18 East, a distance of 385.5473
Thence North 41-00-36 East, a distance of 264.2145
Thence North 30-08-41 East, a distance of 230.9893
Thence North 07-43-31 West, a distance of 202.7149
Thence North 40-45-25 West, a distance of 304.6257
Thence North 70-17-49 West, a distance of 607.3060
Thence North 55-54-46 West, a distance of 310.0155
Thence North 26-09-10 West, a distance of 256.3718
Thence North 00-27-01 East, a distance of 143.1924
Thence North 14-27-19 East, a distance of 118.1782
Thence North 00-23-59 East, a distance of 143.3785
Thence North 54-03-37 West, a distance of 246.4075
Thence North 81-58-34 West, a distance of 433.8727
Thence North 77-04-54 West, a distance of 264.1866
Thence North 37-26-54 West, a distance of 326.8667
Thence North 00-25-42 East, a distance of 200.6306
Thence North 00-24-14 East, a distance of 372.5092
Thence North 15-40-06 East, a distance of 326.7674
Thence North 16-21-03 East, a distance of 208.6903
Thence North 35-24-20 East, a distance of 349.7396
Thence North 63-50-04 East, a distance of 64.2044
Thence North 63-50-50 East, a distance of 256.3718
Thence North 56-43-24 East, a distance of 309.9471
Thence North 53-33-00 East, a distance of 286.5577
Thence North 76-22-18 East, a distance of 945.3672
Thence North 52-15-15 East, a distance of 510.2846
Thence North 66-11-52 East, a distance of 628.5904
Thence North 74-26-54 East, a distance of 625.9155
Thence North 58-25-38 East, a distance of 270.2542
Thence South 85-01-19 East, a distance of 718.8363
Thence South 63-01-36 East, a distance of 384.4457
Thence South 66-20-26 East, a distance of 218.3532
Thence South 69-03-13 East, a distance of 244.9364
Thence North 83-16-16 East, a distance of 230.9660
Thence North 53-34-47 East, a distance of 143.3794
Thence South 84-23-40 East, a distance of 949.5407
Thence South 56-51-35 East, a distance of 476.9601
Thence South 58-35-04 East, a distance of 167.2702
Thence North 84-03-22 East, a distance of 519.0406
Thence North 56-46-52 East, a distance of 103.2473
Thence North 58-23-45 East, a distance of 270.4916
Thence North 71-54-54 East, a distance of 90.6009
Thence South 89-35-01 East, a distance of 172.0045
Thence South 74-03-10 East, a distance of 535.4830
Thence South 44-34-13 East, a distance of 324.1737
Thence South 33-18-20 East, a distance of 310.0497
Thence South 20-36-19 East, a distance of 399.2270
Thence South 47-58-49 East, a distance of 345.0929
Thence South 53-33-09 East, a distance of 389.8856
Thence South 76-35-51 East, a distance of 764.7010
Thence South 81-44-01 East, a distance of 838.9669
Thence South 77-41-35 East, a distance of 556.5393
Thence South 84-08-48 East, a distance of 1209.1792
Thence South 87-06-12 East, a distance of 1319.5612

Exhibit G – Description of the Water Management Plan Area

Thence North 82-17-20 East, a distance of 607.8717
Thence South 89-35-38 East, a distance of 458.6365
Thence North 68-02-09 East, a distance of 526.8664
Thence North 76-22-18 East, a distance of 472.6836
Thence North 76-23-14 East, a distance of 590.8480
Thence South 89-35-37 East, a distance of 114.5029
Thence North 56-42-13 East, a distance of 103.4884
Thence North 63-53-06 East, a distance of 128.0747
Thence North 45-25-36 East, a distance of 243.2076
Thence North 29-27-11 East, a distance of 295.1445
Thence North 41-00-36 East, a distance of 264.2145
Thence South 89-35-37 East, a distance of 114.6279
Thence North 82-16-29 East, a distance of 202.7149
Thence South 89-35-00 East, a distance of 257.8818
Thence South 83-52-26 East, a distance of 288.1455
Thence South 52-40-48 East, a distance of 143.1916
Thence South 30-33-09 East, a distance of 167.2154
Thence South 09-52-16 West, a distance of 174.2679
Thence South 30-08-41 West, a distance of 230.9893
Thence South 22-12-22 West, a distance of 154.4560
Thence South 00-26-15 West, a distance of 229.1317
Thence South 00-23-59 West, a distance of 143.3785
Thence South 26-09-10 East, a distance of 384.5573
Thence South 30-33-01 East, a distance of 334.2063
Thence South 47-04-25 East, a distance of 466.5541
Thence South 59-51-47 East, a distance of 462.0867
Thence South 66-04-10 East, a distance of 718.7888
Thence South 60-34-06 East, a distance of 295.0830
Thence South 36-26-24 East, a distance of 429.9371
Thence South 38-16-32 East, a distance of 183.4302
Thence South 50-55-44 East, a distance of 367.0959
Thence South 80-07-32 East, a distance of 522.9976
Thence South 83-14-16 East, a distance of 259.5556
Thence South 89-35-00 East, a distance of 343.8841
Thence North 59-26-40 East, a distance of 167.0758
Thence North 60-38-50 East, a distance of 231.0356
Thence North 66-27-54 East, a distance of 282.3629
Thence North 63-51-05 East, a distance of 192.3069
Thence South 89-35-22 East, a distance of 200.5051
Thence South 44-36-00 East, a distance of 202.5910
Thence South 18-01-23 East, a distance of 181.4008
Thence South 13-38-22 East, a distance of 236.4173
Thence South 03-58-18 East, a distance of 373.5851
Thence South 10-53-48 East, a distance of 292.2697
Thence South 22-46-58 East, a distance of 218.2120
Thence South 31-34-53 East, a distance of 270.4261
Thence South 39-24-51 East, a distance of 223.8461
Thence North 76-20-46 East, a distance of 118.0872
Thence North 68-37-46 East, a distance of 154.3636
Thence North 18-52-43 East, a distance of 181.1847
Thence North 26-57-53 East, a distance of 256.3714
Thence North 18-50-39 East, a distance of 362.6232
Thence North 36-25-57 East, a distance of 389.8114
Thence North 45-25-49 East, a distance of 364.7890
Thence North 58-48-12 East, a distance of 437.5179
Thence North 73-54-12 East, a distance of 807.0133

Exhibit G – Description of the Water Management Plan Area

Thence South 89-35-13 East, a distance of 372.6347
Thence South 70-07-37 East, a distance of 516.6417
Thence South 57-26-00 East, a distance of 1184.7900
Thence South 42-06-12 East, a distance of 933.1152
Thence South 68-33-43 East, a distance of 399.1137
Thence South 44-35-55 East, a distance of 283.7774
Thence South 68-32-12 East, a distance of 399.1825
Thence South 71-10-13 East, a distance of 453.1256
Thence South 86-24-01 East, a distance of 516.6443
Thence South 63-00-36 East, a distance of 256.2886
Thence South 47-57-26 East, a distance of 345.2181
Thence South 61-08-28 East, a distance of 782.1325
Thence South 53-20-23 East, a distance of 533.2286
Thence South 58-37-21 East, a distance of 835.5739
Thence South 44-35-29 East, a distance of 526.8518
Thence South 68-43-27 East, a distance of 644.0187
Thence South 60-46-50 East, a distance of 654.2487
Thence South 56-28-54 East, a distance of 786.8458
Thence South 34-42-45 East, a distance of 946.2958
Thence South 31-35-39 East, a distance of 1081.5570
Thence South 24-47-42 East, a distance of 1076.9010
Thence South 09-02-24 East, a distance of 174.2261
Thence South 10-53-23 East, a distance of 292.4543
Thence South 29-50-59 East, a distance of 398.0591
Thence South 54-01-30 East, a distance of 246.5173
Thence South 55-54-06 East, a distance of 206.8047
Thence South 39-23-59 East, a distance of 223.7180
Thence South 35-07-27 East, a distance of 246.5891
Thence South 49-48-18 East, a distance of 223.7016
Thence South 71-06-40 East, a distance of 272.0239
Thence South 82-30-21 East, a distance of 230.9730
Thence South 89-35-39 East, a distance of 114.6279
Thence South 78-15-28 East, a distance of 146.1842
Thence South 63-02-06 East, a distance of 192.2788
Thence South 62-57-36 East, a distance of 128.1311
Thence North 00-22-28 East, a distance of 57.3762
Thence North 30-32-53 West, a distance of 166.9909
Thence North 36-27-13 West, a distance of 430.0114
Thence North 55-53-59 West, a distance of 309.9120
Thence North 29-50-11 West, a distance of 398.2213
Thence North 16-42-00 West, a distance of 389.7520
Thence North 03-40-13 West, a distance of 402.2620
Thence North 34-06-00 East, a distance of 310.1378
Thence South 89-35-37 East, a distance of 114.6279
Thence South 89-35-00 East, a distance of 257.8818
Thence South 33-18-20 East, a distance of 103.3499
Thence South 50-17-04 East, a distance of 407.3895
Thence South 83-51-32 East, a distance of 288.0279
Thence South 63-02-07 East, a distance of 192.2783
Thence South 58-09-42 East, a distance of 604.5925
Thence South 59-00-31 East, a distance of 732.2881
Thence North 85-12-37 East, a distance of 316.6057
Thence South 89-35-00 East, a distance of 343.8841
Thence South 79-34-59 East, a distance of 494.6526
Thence North 51-42-18 West, a distance of 326.6633
Thence North 53-35-56 West, a distance of 82.4656

Exhibit G – Description of the Water Management Plan Area

Thence North 53-34-06 West, a distance of 307.3090
Thence North 55-53-22 West, a distance of 413.3665
Thence North 72-53-50 West, a distance of 598.4647
Thence North 60-58-05 West, a distance of 718.2480
Thence North 46-42-41 West, a distance of 390.6740
Thence North 46-42-44 West, a distance of 156.7825
Thence North 44-35-15 West, a distance of 405.2711
Thence North 46-18-48 West, a distance of 669.1426
Thence North 37-52-35 West, a distance of 693.8574
Thence North 34-17-42 West, a distance of 906.2395
Thence North 33-57-07 West, a distance of 659.8059
Thence North 44-35-16 West, a distance of 608.0830
Thence North 46-47-40 West, a distance of 1054.3274
Thence North 48-19-10 West, a distance of 1868.4824
Thence North 56-06-31 West, a distance of 2130.4779
Thence North 66-07-44 West, a distance of 1655.6256
Thence North 58-12-53 West, a distance of 1376.2780
Thence North 41-24-29 West, a distance of 730.8163
Thence North 41-13-30 West, a distance of 345.0212
Thence North 26-08-55 West, a distance of 384.6138
Thence North 13-37-46 West, a distance of 354.3535
Thence North 41-34-35 West, a distance of 385.5755
Thence North 42-50-20 West, a distance of 669.1777
Thence North 50-29-55 West, a distance of 1181.6210
Thence North 31-24-48 West, a distance of 978.2580
Thence North 26-09-14 West, a distance of 704.9949
Thence North 08-33-23 West, a distance of 551.1343
Thence North 10-42-42 East, a distance of 640.9180
Thence North 35-06-54 East, a distance of 453.0875
Thence North 45-23-44 East, a distance of 243.3389
Thence North 52-32-18 East, a distance of 326.7674
Thence North 00-25-00 East, a distance of 171.8795
Thence North 34-34-34 West, a distance of 349.7803
Thence North 44-35-13 West, a distance of 337.0774
Thence North 44-35-20 West, a distance of 271.0057
Thence North 27-14-21 West, a distance of 679.4763
Thence North 09-26-25 West, a distance of 669.1250
Thence North 15-50-43 West, a distance of 716.4738
Thence North 22-47-41 West, a distance of 436.5304
Thence North 20-37-42 West, a distance of 399.1550
Thence North 05-56-49 West, a distance of 259.3960
Thence North 12-05-28 West, a distance of 264.3646
Thence North 14-27-19 East, a distance of 118.1782
Thence North 50-21-25 East, a distance of 158.1102
Thence North 65-13-15 East, a distance of 328.2188
Thence North 82-49-41 East, a distance of 264.3181
Thence South 84-49-29 East, a distance of 420.5895
Thence South 77-19-12 East, a distance of 411.1524
Thence South 62-03-23 East, a distance of 453.0744
Thence South 53-30-14 East, a distance of 237.5929
Thence South 57-59-51 East, a distance of 266.6488
Thence South 66-45-48 East, a distance of 360.0835
Thence South 74-02-50 East, a distance of 326.3171
Thence South 70-08-39 East, a distance of 314.8424
Thence South 63-01-30 East, a distance of 234.3736
Thence South 35-38-22 East, a distance of 237.4798

Exhibit G – Description of the Water Management Plan Area

Thence South 42-04-07 East, a distance of 284.3200
Thence South 48-59-46 East, a distance of 322.1632
Thence South 55-05-28 East, a distance of 338.9985
Thence South 76-41-52 East, a distance of 627.2030
Thence South 80-50-12 East, a distance of 689.1699
Thence South 68-34-43 East, a distance of 243.1736
Thence South 51-17-14 East, a distance of 422.9187
Thence South 23-13-07 East, a distance of 305.0162
Thence South 17-07-37 East, a distance of 348.0598
Thence South 20-36-34 East, a distance of 243.2560
Thence South 77-20-44 East, a distance of 411.1112
Thence North 88-22-32 East, a distance of 489.4467
Thence South 89-35-23 East, a distance of 209.5054
Thence South 77-48-51 East, a distance of 428.1470
Thence South 46-33-41 East, a distance of 358.4156
Thence South 54-02-09 East, a distance of 300.5375
Thence North 76-21-42 East, a distance of 288.1242
Thence North 17-30-54 East, a distance of 237.5765
Thence North 16-48-48 East, a distance of 309.4149
Thence North 34-06-01 East, a distance of 125.9718
Thence North 84-56-56 East, a distance of 368.4308
Thence South 89-35-24 East, a distance of 227.1308
Thence South 79-15-43 East, a distance of 390.4622
Thence South 89-35-24 East, a distance of 751.1442
Thence North 68-02-21 East, a distance of 321.0451
Thence North 76-24-34 East, a distance of 144.1615
Thence North 82-57-46 East, a distance of 405.0514
Thence North 77-54-02 East, a distance of 322.0287
Thence South 66-25-23 East, a distance of 265.9506
Thence South 68-58-41 East, a distance of 149.3127
Thence North 54-52-10 East, a distance of 300.6385
Thence North 29-27-12 East, a distance of 179.7287
Thence North 56-43-55 East, a distance of 251.9098
Thence South 81-28-20 East, a distance of 370.4709
Thence South 78-57-07 East, a distance of 284.3959
Thence South 67-47-29 East, a distance of 470.2621
Thence South 83-24-48 East, a distance of 650.0405
Thence South 87-51-03 East, a distance of 576.6556
Thence North 81-40-49 East, a distance of 229.7933
Thence South 89-34-59 East, a distance of 524.0139
Thence South 80-08-29 East, a distance of 424.8993
Thence South 68-58-59 East, a distance of 149.1738
Thence South 85-18-12 East, a distance of 700.7279
Thence North 69-21-28 East, a distance of 243.2410
Thence North 83-18-13 East, a distance of 140.9616
Thence North 87-02-55 East, a distance of 297.3945
Thence South 84-24-08 East, a distance of 385.7145
Thence South 73-38-13 East, a distance of 381.5806
Thence South 60-46-31 East, a distance of 398.7573
Thence South 44-33-51 East, a distance of 197.5537
Thence South 44-36-26 East, a distance of 148.2746
Thence South 80-51-20 East, a distance of 229.6689
Thence South 77-41-23 East, a distance of 339.1733
Thence South 80-08-20 East, a distance of 106.1940
Thence South 74-17-21 East, a distance of 199.1918
Thence South 63-03-57 East, a distance of 156.1926

Exhibit G – Description of the Water Management Plan Area

Thence South 89-35-24 East, a distance of 139.7536
Thence North 69-52-16 East, a distance of 149.1074
Thence South 74-22-05 East, a distance of 199.2446
Thence South 54-02-09 East, a distance of 150.2688
Thence South 57-32-02 East, a distance of 164.7486
Thence South 80-08-39 East, a distance of 212.5112
Thence South 81-28-20 East, a distance of 246.9807
Thence South 57-34-32 East, a distance of 164.8208
Thence South 59-51-45 East, a distance of 281.7053
Thence South 49-18-45 East, a distance of 297.3849
Thence South 53-35-18 East, a distance of 237.6448
Thence South 41-33-00 East, a distance of 235.0086
Thence South 49-00-08 East, a distance of 483.1160
Thence South 55-49-43 East, a distance of 125.8518
Thence South 44-35-25 East, a distance of 123.5701
Thence South 44-36-30 East, a distance of 271.6237
Thence South 44-36-10 East, a distance of 197.5973
Thence South 31-11-39 East, a distance of 266.6825
Thence South 29-50-24 East, a distance of 242.6743
Thence South 26-09-18 East, a distance of 273.3663
Thence South 28-55-20 East, a distance of 320.7559
Thence South 44-37-15 East, a distance of 247.0063
Thence South 39-21-54 East, a distance of 136.3797
Thence South 39-30-43 East, a distance of 1115.9357
Thence South 56-57-13 East, a distance of 518.5041
Thence South 32-18-58 East, a distance of 290.6424
Thence South 54-36-52 East, a distance of 213.2716
Thence South 47-36-34 East, a distance of 234.9146
Thence South 44-35-24 East, a distance of 172.8920
Thence South 35-05-29 East, a distance of 150.2478
Thence South 59-20-24 East, a distance of 242.6739
Thence South 59-19-30 East, a distance of 242.5664
Thence South 89-35-24 East, a distance of 139.7536
Thence South 89-35-24 East, a distance of 139.7536
Thence South 89-35-23 East, a distance of 52.3763
Thence North 67-16-06 East, a distance of 132.9522
Thence North 00-24-32 East, a distance of 52.5643
Thence North 33-16-47 West, a distance of 62.8730
Thence North 58-37-01 West, a distance of 203.6710
Thence North 47-58-30 West, a distance of 210.3380
Thence North 50-17-39 West, a distance of 248.1038
Thence North 41-34-22 West, a distance of 235.0915
Thence North 35-34-47 West, a distance of 237.6102
Thence North 52-44-11 West, a distance of 261.9812
Thence North 49-21-11 West, a distance of 297.5341
Thence North 49-21-20 West, a distance of 297.3572
Thence North 44-34-50 West, a distance of 271.7576
Thence North 38-15-35 West, a distance of 335.4983
Thence North 27-27-57 West, a distance of 336.0671
Thence North 50-30-00 West, a distance of 360.1165
Thence North 21-23-39 West, a distance of 470.1461
Thence North 10-11-56 West, a distance of 284.4954
Thence North 07-44-11 West, a distance of 246.9982
Thence North 19-33-17 West, a distance of 204.2826
Thence North 41-52-09 West, a distance of 259.7636
Thence North 63-00-09 West, a distance of 429.5609

Exhibit G – Description of the Water Management Plan Area

Thence North 43-07-25 West, a distance of 481.8419
Thence North 42-44-17 West, a distance of 382.9316
Thence North 28-24-46 West, a distance of 398.7864
Thence North 28-23-07 West, a distance of 398.6130
Thence North 38-46-12 West, a distance of 608.4346
Thence North 72-21-04 West, a distance of 530.2057
Thence North 77-53-41 West, a distance of 517.3797
Thence North 84-31-51 West, a distance of 596.0885
Thence North 68-33-48 West, a distance of 486.5318
Thence North 67-12-28 West, a distance of 642.2768
Thence North 76-42-02 West, a distance of 627.0671
Thence North 60-32-28 West, a distance of 899.1237
Thence North 75-54-13 West, a distance of 665.1543
Thence North 66-23-19 West, a distance of 665.0515
Thence North 80-51-29 West, a distance of 459.4613
Thence North 74-27-13 West, a distance of 669.4943
Thence North 63-02-06 West, a distance of 312.4704
Thence North 73-53-13 West, a distance of 580.5569
Thence North 76-51-43 West, a distance of 555.1563
Thence North 72-03-23 West, a distance of 347.9228
Thence North 71-08-13 West, a distance of 497.2030
Thence North 69-01-58 West, a distance of 746.1565
Thence North 46-26-06 West, a distance of 382.9739
Thence North 55-28-34 West, a distance of 654.0611
Thence North 65-37-13 West, a distance of 516.0126
Thence North 73-38-41 West, a distance of 508.7107
Thence North 70-36-46 West, a distance of 591.0123
Thence North 69-01-55 West, a distance of 447.6429
Thence North 64-48-32 West, a distance of 1750.7575
Thence North 68-24-13 West, a distance of 917.8053
Thence North 68-02-33 West, a distance of 1427.2827
Thence North 64-07-22 West, a distance of 1625.0677
Thence North 43-46-42 West, a distance of 876.7911
Thence North 47-49-40 West, a distance of 655.7561
Thence North 61-41-57 West, a distance of 335.8997
Thence North 51-42-49 West, a distance of 199.2231
Thence North 48-40-34 West, a distance of 346.7099
Thence North 47-34-33 West, a distance of 235.0408
Thence North 36-26-36 West, a distance of 174.6548
Thence North 09-53-20 East, a distance of 106.2668
Thence South 78-41-19 East, a distance of 462.3561
Thence South 74-50-24 East, a distance of 343.1933
Thence South 79-53-51 East, a distance of 726.5141
Thence South 82-28-31 East, a distance of 422.3874
Thence North 74-29-44 East, a distance of 254.3821
Thence North 67-11-37 East, a distance of 399.0744
Thence North 60-41-37 East, a distance of 281.6756
Thence North 79-05-27 East, a distance of 445.1700
Thence North 00-26-51 East, a distance of 192.0059
Thence North 31-36-58 West, a distance of 164.7668
Thence North 80-07-13 West, a distance of 637.4534
Thence North 79-17-00 West, a distance of 585.8427
Thence North 83-52-06 West, a distance of 702.1421
Thence North 81-40-22 West, a distance of 634.8176
Thence North 71-46-52 West, a distance of 513.7552
Thence North 78-48-11 West, a distance of 746.7136

Exhibit G – Description of the Water Management Plan Area

Thence North 70-26-56 West, a distance of 905.9868
Thence North 65-52-49 West, a distance of 2823.3710
Thence North 52-03-27 West, a distance of 1519.7285
Thence North 36-15-37 West, a distance of 1023.5333
Thence North 28-50-12 West, a distance of 1501.3573
Thence North 03-16-40 East, a distance of 699.5825
Thence North 40-00-38 East, a distance of 657.5376
Thence North 55-55-24 East, a distance of 339.1029
Thence North 56-42-53 East, a distance of 377.8643
Thence North 26-59-25 East, a distance of 312.6105
Thence North 71-58-47 East, a distance of 497.0045
Thence North 80-06-42 East, a distance of 585.9547
Thence South 87-23-25 East, a distance of 454.3462
Thence North 42-41-35 East, a distance of 519.3043
Thence North 65-30-29 East, a distance of 539.2736
Thence North 85-13-27 East, a distance of 192.9198
Thence South 77-48-22 East, a distance of 428.1601
Thence South 79-18-05 East, a distance of 195.2692
Thence North 69-51-14 East, a distance of 298.5136
Thence North 28-19-28 East, a distance of 335.9044
Thence North 31-22-11 East, a distance of 305.6825
Thence North 56-01-15 East, a distance of 402.0238
Thence North 82-39-26 East, a distance of 387.8052
Thence North 78-08-24 East, a distance of 411.1519
Thence North 60-22-03 East, a distance of 383.3919
Thence North 59-26-14 East, a distance of 203.6705
Thence North 05-12-58 East, a distance of 210.3711
Thence North 54-35-53 West, a distance of 426.4772
Thence North 11-40-50 West, a distance of 250.0533
Thence North 49-48-05 East, a distance of 161.0345
Thence North 48-23-44 East, a distance of 235.0392
Thence North 00-24-37 East, a distance of 174.5675
Thence North 23-13-24 West, a distance of 304.9592
Thence North 70-45-15 East, a distance of 259.7676
Thence South 78-49-18 East, a distance of 373.3326
Thence South 72-19-46 East, a distance of 530.4007
Thence North 68-01-44 East, a distance of 321.0687
Thence North 61-21-05 East, a distance of 179.8988
Thence North 15-39-15 East, a distance of 199.2007
Thence North 00-24-37 East, a distance of 174.5675
Thence North 09-52-20 West, a distance of 195.3932
Thence North 38-41-05 West, a distance of 359.9806
Thence North 38-15-35 West, a distance of 335.4983
Thence North 24-47-03 West, a distance of 328.3020
Thence North 18-01-30 West, a distance of 220.9698
Thence North 00-27-21 East, a distance of 157.1300
Thence North 24-36-33 West, a distance of 289.0680
Thence North 26-08-49 West, a distance of 195.4380
Thence North 37-10-21 West, a distance of 286.5286
Thence North 71-10-31 West, a distance of 276.0141
Thence North 89-35-24 West, a distance of 366.7594
Thence North 47-18-37 West, a distance of 259.8516
Thence North 02-26-15 West, a distance of 349.7545
Thence North 02-27-48 West, a distance of 125.0526
Thence North 02-27-50 West, a distance of 78.5106
Thence North 02-27-01 West, a distance of 146.1957

Exhibit G – Description of the Water Management Plan Area

Thence North 05-17-26 West, a distance of 351.1208
Thence North 29-50-24 West, a distance of 242.6743
Thence North 87-54-29 West, a distance of 594.1460
Thence South 25-25-45 West, a distance of 289.0690
Thence South 07-33-35 West, a distance of 54.1577
Thence South 07-31-36 West, a distance of 368.3617
Thence South 15-40-43 West, a distance of 398.2550
Thence South 21-34-12 West, a distance of 580.7325
Thence South 17-07-05 West, a distance of 546.9813
Thence South 18-03-11 West, a distance of 403.3575
Thence South 25-37-23 West, a distance of 328.0751
Thence South 34-42-09 West, a distance of 465.0331
Thence South 25-01-48 West, a distance of 461.1868
Thence South 54-23-57 West, a distance of 475.1916
Thence South 69-37-52 West, a distance of 541.7496
Thence North 73-56-54 West, a distance of 453.4280
Thence North 48-34-43 West, a distance of 532.4290
Thence North 28-23-07 West, a distance of 398.6121
Thence North 54-35-53 West, a distance of 426.4777
Thence North 16-41-42 West, a distance of 237.5764
Thence North 12-06-59 West, a distance of 322.1772
Thence North 33-16-47 West, a distance of 251.7194
Thence North 60-46-31 West, a distance of 398.7569
Thence North 40-31-06 West, a distance of 346.7031
Thence North 29-18-46 West, a distance of 281.6207
Thence North 31-34-49 West, a distance of 329.6291
Thence North 65-37-55 West, a distance of 344.1602
Thence North 33-16-48 West, a distance of 314.8173
Thence North 40-10-53 West, a distance of 160.9938
Thence South 48-09-08 West, a distance of 259.5913
Thence South 05-10-56 West, a distance of 210.3598
Thence South 01-52-06 East, a distance of 437.1073
Thence South 17-14-28 East, a distance of 403.1796
Thence South 16-17-52 East, a distance of 546.9801
Thence South 17-24-29 East, a distance of 513.9131
Thence South 44-35-54 East, a distance of 296.2405
Thence South 40-10-11 East, a distance of 322.2593
Thence South 35-07-29 East, a distance of 300.4644
Thence South 31-25-13 East, a distance of 596.0948
Thence South 27-28-50 East, a distance of 335.9003
Thence South 04-21-44 East, a distance of 210.3594
Thence South 42-01-35 West, a distance of 210.4263
Thence South 45-23-50 West, a distance of 197.5089
Thence South 52-08-16 West, a distance of 422.9006
Thence South 45-24-36 West, a distance of 469.3541
Thence South 70-25-56 West, a distance of 408.8638
Thence South 66-59-15 West, a distance of 571.0711
Thence South 33-18-10 West, a distance of 353.7851
Thence South 37-17-32 West, a distance of 349.2845
Thence South 49-29-46 West, a distance of 346.7099
Thence South 65-13-51 West, a distance of 328.1924
Thence South 55-43-12 West, a distance of 276.0820
Thence South 59-26-46 West, a distance of 407.4482
Thence South 55-41-57 West, a distance of 385.3996
Thence South 74-49-34 West, a distance of 746.6568
Thence South 88-29-17 West, a distance of 502.1748

Exhibit G – Description of the Water Management Plan Area

Thence North 70-28-56 West, a distance of 460.1936
Thence North 69-36-20 West, a distance of 783.2207
Thence North 43-33-28 West, a distance of 939.4676
Thence North 43-33-19 West, a distance of 1036.0201
Thence North 40-54-46 West, a distance of 2583.7541
Thence North 31-11-35 West, a distance of 1531.8376
Thence North 29-04-17 West, a distance of 883.9252
Thence North 09-00-43 East, a distance of 1454.7700
Thence North 54-11-24 West, a distance of 779.7834
Thence North 87-31-53 West, a distance of 468.6850
Thence North 57-43-25 West, a distance of 728.5775
Thence North 45-11-13 West, a distance of 1123.8200
Thence North 42-28-03 West, a distance of 639.0971
Thence North 44-35-23 West, a distance of 993.5551
Thence North 53-37-20 West, a distance of 1053.8761
Thence North 45-08-03 West, a distance of 1265.5924
Thence North 59-09-53 West, a distance of 2532.3330
Thence North 47-35-59 West, a distance of 2350.0134
Thence North 58-27-25 West, a distance of 2060.8752
Thence North 66-50-08 West, a distance of 1174.2981
Thence North 63-57-03 West, a distance of 968.6480
Thence North 63-00-31 West, a distance of 390.6801
Thence North 70-40-49 West, a distance of 646.2686
Thence North 40-55-19 West, a distance of 581.6539
Thence North 34-57-19 West, a distance of 664.1211
Thence North 29-30-50 West, a distance of 665.0486
Thence North 40-11-42 West, a distance of 644.1840
Thence North 32-41-45 West, a distance of 479.4718
Thence North 31-47-25 West, a distance of 557.3641
Thence North 35-29-16 West, a distance of 625.5074
Thence North 57-26-41 West, a distance of 722.0837
Thence North 56-11-52 West, a distance of 920.3187
Thence North 52-01-01 West, a distance of 859.5622
Thence North 43-09-18 West, a distance of 988.3405
Thence North 48-19-27 West, a distance of 1138.6784
Thence North 49-20-55 West, a distance of 892.3305
Thence North 61-42-59 West, a distance of 128.6036
Thence North 61-46-06 West, a distance of 582.4067
Thence North 38-45-39 West, a distance of 608.3563
Thence North 57-50-10 West, a distance of 431.4674
Thence North 54-15-44 West, a distance of 513.7375
Thence North 47-06-09 West, a distance of 284.2715
Thence North 61-17-55 West, a distance of 257.9420
Thence North 69-55-30 West, a distance of 259.6503
Thence North 82-28-31 West, a distance of 422.3874
Thence North 76-33-36 West, a distance of 233.1347
Thence North 73-00-13 West, a distance of 856.5357
Thence North 30-02-19 West, a distance of 344.5967
Thence North 32-29-37 West, a distance of 707.3623
Thence North 37-17-46 West, a distance of 485.6130
Thence North 24-21-08 West, a distance of 500.1906
Thence North 19-14-31 West, a distance of 519.2580
Thence North 09-53-20 East, a distance of 212.5327
Thence North 00-24-37 East, a distance of 296.8196
Thence North 38-14-00 West, a distance of 335.6954
Thence North 89-35-24 West, a distance of 192.1299

Exhibit G – Description of the Water Management Plan Area

Thence North 89-35-24 West, a distance of 209.6304
Thence North 55-06-11 West, a distance of 339.1010
Thence North 16-16-08 West, a distance of 182.4945
Thence North 34-35-39 West, a distance of 213.1185
Thence North 64-49-05 West, a distance of 250.1489
Thence North 70-17-53 West, a distance of 370.0374
Thence North 44-34-57 West, a distance of 345.8289
Thence North 16-18-05 West, a distance of 364.7246
Thence North 29-57-57 West, a distance of 587.1073
Thence North 16-16-28 West, a distance of 182.4350
Thence North 38-34-12 East, a distance of 310.9619
Thence North 26-58-53 East, a distance of 507.7685
Thence North 26-02-10 East, a distance of 484.4089
Thence North 28-30-44 East, a distance of 296.9540
Thence North 09-08-31 East, a distance of 229.7301
Thence North 06-25-49 East, a distance of 333.7245
Thence North 09-22-35 East, a distance of 336.0530
Thence North 04-13-57 East, a distance of 262.5279
Thence North 31-34-44 West, a distance of 164.7022
Thence South 45-26-05 West, a distance of 98.9540
Thence South 50-38-19 West, a distance of 136.2910
Thence South 31-20-58 West, a distance of 203.7449
Thence South 20-23-24 West, a distance of 204.5015
Thence South 37-18-31 West, a distance of 174.6797
Thence South 35-56-42 West, a distance of 300.4641
Thence South 30-10-36 West, a distance of 281.7456
Thence South 19-50-56 West, a distance of 314.7618
Thence South 10-42-47 West, a distance of 390.6845
Thence South 56-43-54 West, a distance of 251.9103
Thence South 62-31-10 West, a distance of 335.9003
Thence North 83-15-45 West, a distance of 316.4353
Thence South 67-46-15 West, a distance of 226.9957
Thence South 84-04-56 West, a distance of 316.4363
Thence North 80-51-20 West, a distance of 229.6689
Thence North 66-23-39 West, a distance of 398.4678
Thence North 66-22-50 West, a distance of 665.7744
Thence North 40-11-08 West, a distance of 805.0972
Thence North 55-01-37 West, a distance of 954.6359
Thence North 44-35-45 West, a distance of 419.8105
Thence North 59-05-55 West, a distance of 344.5304
Thence North 42-58-24 West, a distance of 432.4011
Thence North 50-05-14 West, a distance of 384.7675
Thence North 63-02-07 West, a distance of 312.4699
Thence North 64-14-47 West, a distance of 367.0874
Thence South 17-59-39 East, a distance of 110.4651
Thence South 35-50-56 East, a distance of 324.8520
Thence South 32-28-58 East, a distance of 353.7862
Thence South 31-35-51 East, a distance of 329.4689
Thence South 44-35-03 East, a distance of 420.0770
Thence South 41-51-46 East, a distance of 519.2197
Thence South 13-37-56 East, a distance of 287.9879
Thence South 09-35-21 East, a distance of 301.6528
Thence South 05-18-52 East, a distance of 175.4412
Thence South 27-00-57 West, a distance of 117.2299
Thence South 49-48-06 West, a distance of 161.0338
Thence North 89-35-23 West, a distance of 157.1290

Exhibit G – Description of the Water Management Plan Area

Thence North 72-13-07 West, a distance of 292.8656
Thence North 38-14-40 West, a distance of 223.5397
Thence North 49-21-21 West, a distance of 1487.2756
Thence North 50-30-26 West, a distance of 154.9607
Thence South 53-10-59 West, a distance of 150.5821
Thence South 54-44-21 West, a distance of 1005.8733
Thence South 55-06-24 West, a distance of 6992.3760
Thence South 54-09-37 West, a distance of 1051.0319
to the True Point of Beginning.

Perimeter: 551741.8300

Area: 2495992473.0343 57300.1027 acres

Mapcheck Closure - (Uses listed courses & COGO Units)

Error of Closure: 0.02737 Thence South 68-46-44 W

Precision 1: 20161685.12

Exhibit H – Judgment and Decree

1
2
3
4
5
6
7
8 UNITED STATES DISTRICT COURT
9 CENTRAL DISTRICT OF CALIFORNIA
10

11 SOBOBA BAND OF LUISEÑO
12 INDIANS, a federally recognized
Indian tribe,

13 Plaintiff,

14 v.

15 METROPOLITAN WATER
16 DISTRICT OF SOUTHERN
CALIFORNIA, a California
metropolitan water district; LAKE
17 HEMET MUNICIPAL WATER
DISTRICT, a California water
18 district; the UNITED STATES OF
AMERICA for the benefit of the
19 Soboba Band of Luiseño Indians,

20 Defendants,

21 v.

22 EASTERN MUNICIPAL WATER
23 DISTRICT, a California water
district,

24 Third-Party Defendant.
25
26
27
28

Case No. 00-04208 GAF (MANx)
Judge: Honorable Gary A. Feess

STIPULATED JUDGMENT

JUDGMENT AND DECREE

1 The Court has considered the Settlement Agreement dated _____, 2004,
2 which permanently resolves the claims of the Soboba Band of Luiseño Indians,
3 (hereinafter “Soboba Tribe”) and the United States appearing for the benefit of the
4 Soboba Tribe for alleged infringement of its water rights in the San Jacinto River
5 and the Canyon Sub-basin and Intake portion of the Upper Pressure Sub-basin
6 associated therewith (collectively “Basin”) in Riverside County, California, and for
7 damages related to historical interference with the Soboba Tribe’s rights and
8 unauthorized use of its water. A copy of the Settlement Agreement is attached as
9 Exhibit 1 to the Stipulation and Request for Entry of Judgment and Decree.

10 After consideration of the pleadings and papers filed in this action, the
11 evidence presented by the Parties, and the Stipulation and Request for Entry of
12 Judgment and Decree, it is hereby ORDERED, ADJUDGED AND DECREED:

13
14 1. The Settlement Agreement is hereby approved in its entirety, and this
15 Judgment and Decree incorporates the definitions set forth therein. When used in
16 this Judgment and Decree, the term “United States” shall mean the United States of
17 America acting on behalf of the Soboba Tribe, and in no other capacity except as
18 specifically otherwise provided herein.

19
20 2. The Soboba Tribe shall have the right to waters beneath the Soboba Indian
21 Reservation, which shall be held in trust by the United States for the benefit of the
22 Soboba Tribe, as follows:

23 A. The prior and paramount right, superior to all others, to pump 9,000
24 AFA from the Basin for any use on the Reservation and lands now owned or
25 hereafter acquired by the Soboba Tribe contiguous to the Reservation or within the
26 Basin.

27 B. The Soboba Tribe’s right to pump a total of 9,000 AFA from the
28

Basin is without regard to whether the water was naturally or artificially recharged.

1 C. In the event the Soboba Tribe is unable, except for mechanical failure
2 of its wells, pumps or water facilities, to produce from its existing wells or
3 equivalent replacements up to 3,000 AFA production from the Canyon Sub-basin
4 and the remainder of its Tribal Water Right from the Intake Sub-basin, Eastern
5 Municipal Water District and Lake Hemet Municipal Water District (“the Local
6 Districts”) shall deliver any shortage to the Soboba Tribe. Any shortage shall be
7 delivered at such locations as the Soboba Tribe and the Local Districts may agree,
8 or if there is no agreement, at the wellheads where the shortage occurred. Such
9 water may be supplied from Local District wells in either the Canyon or Intake
10 Sub-basins, or from other sources. For any water delivered pursuant to this
11 paragraph, the Soboba Tribe shall pay an acre-foot charge equal to its then current
12 cost of production, and any avoided cost of treatment, from the wells where the
13 shortage occurred, assuming pumping lifts equal to the Soboba Tribe’s averages in
14 the respective Sub-basins over the preceding ten years.

15
16 3. Beginning on the Effective Date of the Settlement Agreement, the Soboba
17 Tribe’s right to pump groundwater in the exercise of its Tribal Water Right shall be
18 subject to the following provisions:

19 A. The Soboba Tribe agrees to limit its exercise of the Tribal Water
20 Right to 4,100 acre-feet annually, for a period of fifty (50) years commencing with
21 the Effective Date of the Settlement Agreement, according to the schedule set forth
22 in Exhibit F of the Settlement Agreement. Should the Soboba Tribe during that
23 period identify a need for water in addition to the Schedule set forth in Exhibit F,
24 the Soboba Tribe shall have the right to purchase water from the Water
25 Management Plan at the rate then being charged to the Water Management Plan’s
26 municipal producers.

27 B. Any use of the Tribal Water Right by an individual member of the
28

Soboba Tribe shall be satisfied out of the water resources provided to the Soboba
Tribe in the Settlement Agreement and this Judgment and Decree.

4. The foregoing rights are in full satisfaction of all of the Soboba Tribe's
claims as provided in Article 5 of the Settlement Agreement.

5. This Court retains jurisdiction over this matter and the Parties for the limited
and sole purpose of interpretation and enforcement of this Judgment and Decree
and the Settlement Agreement.

6. The Action shall be transferred to the United States District Court, Central
District of California, Eastern Division.

7. Except as may be included in the payments contemplated by the Settlement
Agreement, no Party shall recover any attorney's fees or costs from any other
Party.

8. The Parties have waived their rights to appeal, and therefore, this Judgment
and Decree shall become final and nonappealable as of the date it is entered. This
Judgment and Decree shall become enforceable as of the date the United States
Secretary of the Interior causes to be published in the Federal Register a statement
of findings that all actions necessary to make the settlement effective have been
completed, as required by Section 10 of the Soboba Band of Luiseño Indians
Settlement Act, Public Law _____.

Dated: _____, 200_

United States District Court Judge

Exhibit I – Soboba Tribe’s Water Development Schedule

SETTLEMENT YEARS (FROM EFFECTIVE DATE)	MAXIMUM TRIBAL USAGE (AFA)
1 – 5	2900
6 – 10	3215
11 – 15	3520
16 – 20	3825
21 – 25	4010
26 – 30	4020
31 – 35	4025
36 – 40	4040
41 – 45	4075
46 – 50	4100

Exhibit J – Description of EMWD Property

Parcel 1:

The North half of the Northwest quarter of Section 34 in Township 5 South, Range 2 West, San Bernardino Meridian, in the County of Riverside, State of California, according to the Official Plat thereof;

Excepting therefrom the Westerly 30 feet for road purposes as conveyed to the County of Riverside, by Deed recorded November 13, 1929 in Book 722 page 447 of Deeds, Riverside County Records;

Also excepting therefrom that portion conveyed to the County of Riverside, for road purposes, by Deed filed for record January 18, 1949 as Instrument No. 1917, Official Records.

Also except that portion conveyed to Riverside County Flood Control and Water Conservation District by Grant Deed recorded May 13, 1987 as Instrument No. 133741, Official Records.

Also except that portion conveyed to the Metropolitan Water District of Southern California, a public corporation, by Grant Deed recorded July 22, 1994 as Instrument No. 291698, Official Records.

Also except that portion conveyed to the Metropolitan Water District of Southern California by Grant Deed recorded July 22, 1994 as Instrument No. 291699, Official Records.

Also except that portion conveyed to the Metropolitan Water District of Southern California, a public corporation by Grant Deed recorded January 30, 1997 as Instrument No. 32920, Official Records.

Parcel 2:

The South half of the Northwest quarter of Section 34, Township 5 South, Range 2 East, San Bernardino Meridian, in the County of Riverside, State of California, according to the Official Plat thereof.

Except that portion conveyed to the County of Riverside, by deed recorded April 26, 1949 in Book 1071, Page 392, Official Records.

Also except that portion conveyed to the Metropolitan Water District of Southern California, a public corporation, by Grant Deed recorded July 22, 1994 as Instrument No. 291698, Official Records.

Also except that portion conveyed to the Metropolitan Water District of Southern California, a public corporation by Grant Deed recorded January 30, 1997 as Instrument No. 32920, Official Records.

Also except that portion conveyed to the Metropolitan Water District of Southern California, a public corporation, by Grant Deed recorded May 5, 1997 as Instrument No. 154365, Official Records.

Exhibit K - Description of MWD Property

DRAFT

EXHIBIT A

Diamond Valley Lake
144-1-649C
Grant Deed
MWD to
The Soboba Band of Luiseno Indians

That parcel of land conveyed to The Metropolitan Water District of Southern California by Grant Deed recorded April 25, 1996 as Instrument No. 149322 Official Records of Riverside County, California, lying within the west half of the northeast quarter of Section 34, Township 5 South, Range 2 West San Bernardino Meridian, as shown on Record of Survey filed in Book 104, pages 62 through 76, inclusive, Records of Survey of said County.

EXCEPTING therefrom that portion lying southerly of the northerly line of that certain parcel conveyed to the County of Riverside by Grant Deed recorded November 21, 1999 as Document No. 1999-463789 Official Records of said County.

ALSO EXCEPTING therefrom that portion lying northerly of the southerly line of that certain parcel conveyed to the Riverside County Flood Control and Water Conservation District by Document No. 1999-441419, recorded October 4, 1999, Official Records of said County

Containing 21.718 acres, more or less.

All as shown on EXHIBIT "B" attached hereto and made a part hereof.

END OF DESCRIPTION

PREPARED UNDER MY SUPERVISION

~~DRAFT~~

Date _____

EXHIBIT B

PAGE 1 OF 1

W1/2NE1/4, SEC. 34, T5S, R2W, SBM,
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

THIS EXHIBIT IS TO BE ATTACHED TO THE LEGAL DESCRIPTION

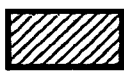
144-1-649A
GRANT DEED
TO RIVERSIDE COUNTY FLOOD CONTROL
& WATER CONSERVATION DISTRICT
O.R. DOC. # 1999-441419, 10-04-1999

144-1-649B
GRANT DEED
TO COUNTY OF RIVERSIDE
O.R. DOC. # 1999-483789, 10-21-1999

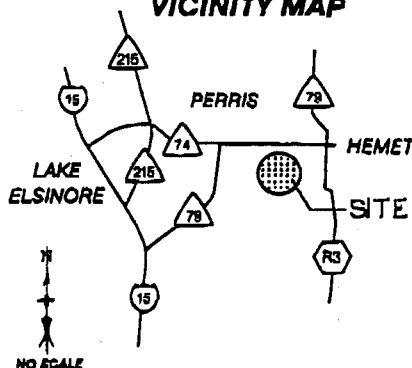
144-1-649
MWD FEE PARCEL
O.R. INST. # 149322
4-25-1986

TABLE		
1	N89°49'11"E	1329.57'
2	S00°07'08"E	723.98'
3	N89°39'24"W	997.55'
4	N00°20'36"E	30.00'
5	N89°39'24"W	309.45'
6	S00°03'43"W	30.00'
7	N89°39'24"W	25.00'
8	N00°03'43"E	711.82'

LEGEND

 = 144-1-649C
GRANT DEED
21.718 ACRES.

VICINITY MAP



PREPARED UNDER
MY SUPERVISION

DRAFT

DATE _____

**THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA**

DIAMOND VALLEY LAKE PROJECT

GRANT DEED

MWD

TO

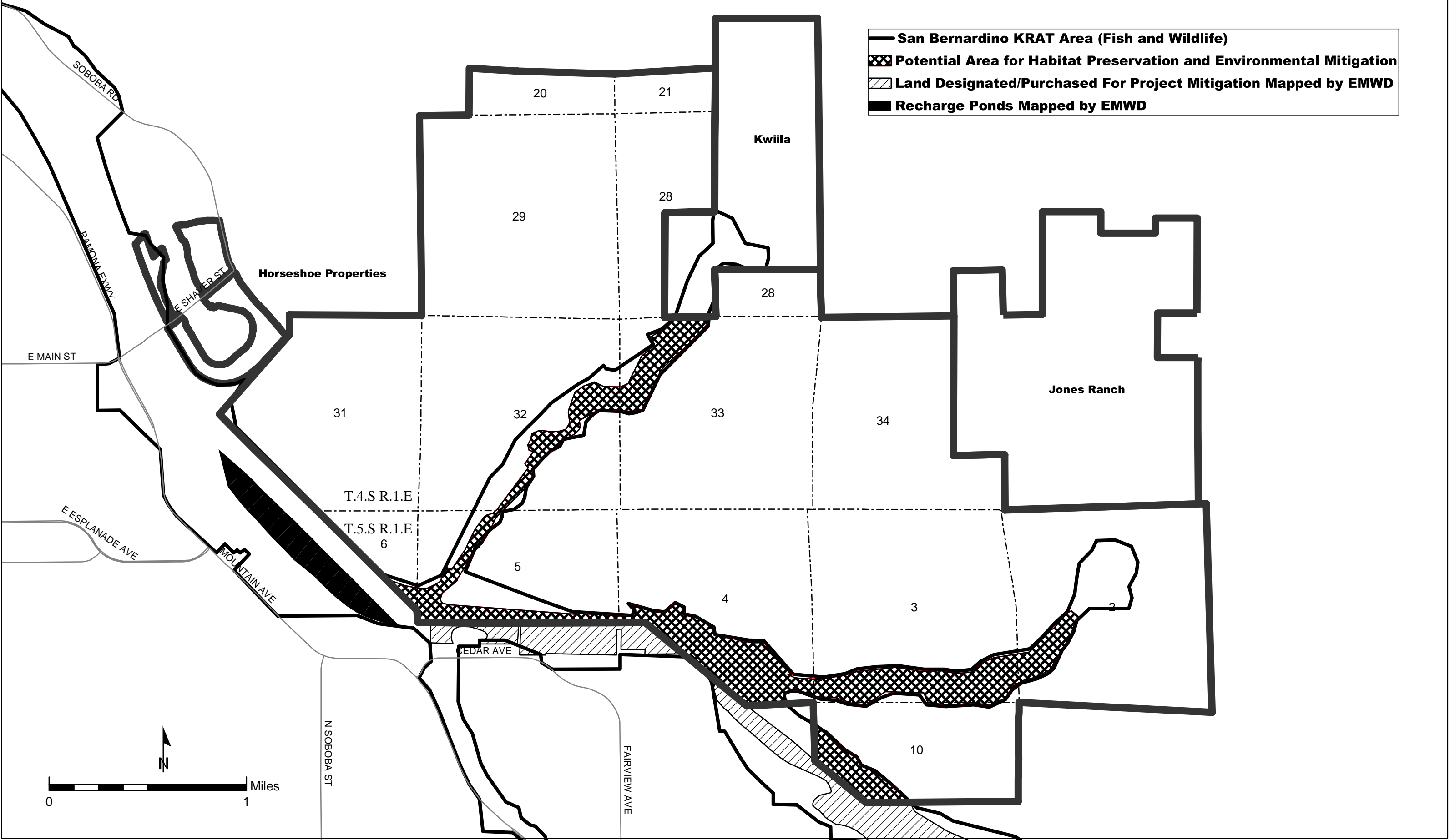
THE SOBOBA BAND OF LUISENO INDIANS

144-1-649C

Exhibit L – Description of LHMWD Property

Portions of Lots 3, 4 and 5 of Fairview Tract, as shown on the plat in San Diego Map Book 006, page 307, in Riverside County, California, comprising 11.57 acres more or less.

Exhibit M - Map of Potential Soboba Reservation Lands for Habitat Preservation and /or Environmental Mitigation



DRAFT

Attorneys for _____

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

EASTERN MUNICIPAL WATER
DISTRICT, a California municipal
water district,

Plaintiff,

v.

LAKE HEMET MUNICIPAL
WATER DISTRICT, a California
municipal water district;
CITY OF HEMET, a California
municipal corporation;
CITY OF SAN JACINTO, a
California municipal corporation;
_____, an individual;
_____, an individual;
_____, an individual;
_____, an individual,

Defendants.

Case No.

Judge:

STIPULATED JUDGMENT

Action Filed: _____, 200_

Trial Date: Stipulation

FINDINGS

After consideration of the pleadings and the Stipulation for Entry of Judgment, the Court finds that:

1. Complaint. On _____, 200_, Plaintiff Eastern Municipal Water District ("Eastern") filed a Complaint against Defendants Lake Hemet Municipal Water District ("Lake Hemet"), City of Hemet ("Hemet"), City of San Jacinto ("San Jacinto"), _____, _____, _____. The Complaint requests a declaration of Plaintiff's and Defendants' individual and collective rights to surface water and groundwater in the Canyon Sub-basin, the San Jacinto Upper Pressure Sub-basin downstream to Bridge Street, and the Hemet Basin ("Management Area") and the imposition of a physical solution to achieve the optimum, reasonable, beneficial use of the waters of the Management Area pursuant to Section 2 of Article X of the California Constitution. A map describing the boundaries of the Management Area is attached to this Judgment as Exhibit A and to the Complaint.

2. Parties.

A. Eastern. Eastern is a California municipal water district formed pursuant to the Municipal Water District Law, California Water Code Sections 71000-73001 (West 1966), with its principal place of business in Riverside County, California. Eastern diverts surface water from the San Jacinto River, and pumps groundwater from the Management Area for use by its customers within its boundaries.

1 B. Lake Hemet. Lake Hemet is a California municipal water
2 district formed pursuant to the Municipal Water District Law, California Water
3 Code Sections 71000-73001 (West 1966), with its principal place of business in
4 Riverside County, California. Lake Hemet diverts surface water from the Santa
5 Jacinto River and its tributaries, and pumps groundwater from the Management
6 Area for use by its customers within its boundaries.

7
8 C. Hemet. Hemet is a California municipal corporation providing
9 utility services pursuant to the California Constitution, Article XI, Section 9.
10 Hemet pumps groundwater from the Management Area for use by its customers
11 within its boundaries.

12
13 D. San Jacinto. San Jacinto is a California municipal corporation
14 providing utility services pursuant to the California Constitution, Article XI,
15 Section 9. San Jacinto pumps groundwater from the Management Area for use by
16 its customers within its boundaries.

17
18 E. _____, _____, _____, _____ and _____ are
19 persons who own farms or other property within the Management Area, and pump
20 groundwater from the Management Area.

21
22 3. Answers and Stipulation for Judgment. On _____, 200_,
23 Defendants filed Answers. On _____, 200_, the Parties filed a Stipulation
24 for Entry of Judgment.

25
26 4. Sole Producers. Other than the Soboba Band of Luiseno Indians, and
27 certain overlying users not parties to this litigation, the parties claim essentially all
28 of the rights to produce surface water and groundwater in the Management Area.

1 5. Importance of Surface Water and Groundwater. Surface water and
2 groundwater from the Management Area are important water supplies for
3 agriculture, domestic and municipal use. The Parties have a mutual and collective
4 interest in the coordinated management of such water resources to ensure that the
5 common resource is used efficiently and reasonably, and that it is sustained and
6 replenished.

7
8 6. Overdraft. It is estimated that the overdraft of the Management Area is
9 at least 10,000 acre-feet per year. This estimate will be refined through further
10 studies to be completed pursuant to the Water Management Plan, including data on
11 the several sub-basins within the Management Area. Studies confirm that in recent
12 years the total production from the Management Area, including pumping by those
13 persons not parties to this litigation, has averaged approximately 63,800 acre-feet
14 per year.

15
16 7. Importance of Judgment. The Parties have an interest in the physical
17 solution imposed by this Judgment to promote the efficient and coordinated
18 management of surface water and groundwater, to avoid problems from overdraft,
19 to assist in protecting the rights of the Soboba Band of Luiseno Indians, to sustain
20 and enhance water resources, and to resolve competing claims to surface water and
21 groundwater.

22
23 8. Jurisdiction. This Court has jurisdiction to enter this Judgment
24 declaring and adjudicating the rights of the Parties to the reasonable and beneficial
25 use of surface water and groundwater in the Management Area, and to impose a
26 physical solution pursuant to law, including California Constitution, Article X,
27 Section 2.

JUDGMENT

IT IS ORDERED, ADJUDGED AND DECREED:

1. DEFINITIONS.

1.1 Adjusted Production Right – the Base Production Right of each Public Agency, as adjusted pursuant to Sections 3.2 to 3.2.5.

1.2 Administrative Assessment – an acre-foot charge to be levied against each Public Agency for water pumped up to its Adjusted Production Right, including any unused amount of such Right that is pumped in a following year. Such assessments shall be used for Administrative Expenses, and for the purchase of Supplemental Water after Administrative Expenses have been paid.

1.3 Administrative Expenses – Watermaster's expenses for office rental, personnel, supplies, office equipment, general overhead, preparing and collecting assessments, monitoring well pumping, measuring water levels, sampling and analyzing water quality, compiling and interpreting collected data, conducting special studies, and litigation.

1.4 Advisor. An independent engineering firm or qualified individual as provided in Section 9.6.3.

1.5 Annual Basin Yield – the quantity of Groundwater that Watermaster determines the Parties may Produce from the Management Area in a calendar year without a replenishment obligation under the Physical Solution.

1 1.6 Base Production Right – the water right of a Public Agency or
2 Class B Participant as set forth in the attached Exhibit "C."

3
4 1.7 Carry-Over Credit – a Party's credit against the Replenishment
5 Assessment in a Fiscal Year, based on the Party's Adjusted Production Right or
6 share of Imported Water not produced in prior calendar years.

7
8 1.8 Class A Participant – a Private Pumper who stipulates to this
9 Judgment and participates in the Water Management Plan as defined in Sections
10 4.3 to 4.3.5.

11
12 1.9 Class B Participant – a Private Pumper who stipulates to this
13 Judgment and participates in the Water Management Plan as defined in Sections
14 4.4 to 4.4.6.

15
16 1.10 Fiscal Year – the period from July 1 through June 30 of the
17 following calendar year.

18
19 1.11 Fruitvale Documents –

20
21 (a) Fruitvale Judgment – The Judgment and Decree entered
22 in the Superior Court for the County of Riverside on June 4, 1954, in an action
23 titled The City of San Jacinto, et al. v. Fruitvale Mutual Water Company, et al.,
24 Case No. 51-546;

25
26 (b) Fruitvale Mutual Water Company Sale of Assets to
27 Eastern – That certain "Agreement for the Sale of Assets of the Fruitvale Mutual
28 Water Company to Eastern Municipal Water District" dated September 10, 1971;

1 (c) Fruitvale Mutual Water Company Agency Agreements –
2 The Agreement Between the City of San Jacinto and Eastern Municipal Water
3 District dated June 15, 1972, the Agreement Between Lake Hemet Municipal Water
4 District and Eastern Municipal Water District dated June 9, 1972, and the
5 Agreement Between the City of Hemet and Eastern Municipal Water District dated
6 June 13, 1972, all providing for recognition of ownership of stock in Fruitvale
7 Mutual Water Company by the Cities and by Lake Hemet, and making provision
8 for the continued sale of water produced through the Fruitvale facilities by Eastern
9 to the Cities and to Lake Hemet.

10
11 1.12 Groundwater – all water within and beneath the ground
12 surface of the Management Area.

13
14 1.13 Imported Water – An average of 7,500 acre feet annually of
15 water sold by The Metropolitan Water District of Southern California to Eastern
16 pursuant to Section 4.4 of the Soboba Band of Luiseño Indians “Settlement
17 Agreement.”

18
19 1.14 Management Area –the Canyon Sub-basin, the San Jacinto
20 Upper Pressure Sub-basin downstream to Bridge Street, and the Hemet Basin, as
21 delineated on the map attached as Exhibit "A."

22
23 1.15 Metropolitan – The Metropolitan Water District of Southern
24 California.

25
26 1.16 Natural Recharge – Groundwater replenishment within the
27 Management Area occurring from precipitation on the surface, percolation from
28 surface flows of the San Jacinto River and its tributaries, return flows from

1 irrigation, artificial spreading or injection of such surface flows, and subsurface
2 inflows.

3
4 1.17 Non-Participant – a Private Pumper who elects not to
5 participate in the Management Plan, or to be a party to this Judgment.

6
7 1.18 Overdraft – a condition whereby pumping in the Management
8 Area exceeds the Safe Yield thereof.

9
10 1.19 Overlying Right – the appurtenant right of an owner of land
11 overlying the Management Area to pump water from such land for beneficial use
12 thereon.

13
14 1.20 Party or Parties – Eastern, Lake Hemet, Hemet, San Jacinto
15 and the other Persons listed in the attached Exhibit "B."

16
17 1.21 Person – any individual, partnership, association, corporation,
18 trust, government agency or other organization.

19
20 1.22 Physical Solution – the Court decreed method of managing
21 the water supply of the Management Area to maximize the reasonable and
22 beneficial use of the waters thereof pursuant to the California Constitution,
23 Article X, Section 2, to eliminate overdraft pursuant to the provisions of this
24 Judgment, to protect the prior rights of the Soboba Tribe, and to provide for the
25 substantial enjoyment of all water rights recognizing their priorities.

1 1.23 Private Pumper – a Person who owns land with an Overlying
2 Right or other right in the Management Area and pumps more than 25 acre-feet
3 per year.

4
5 1.24 Public Agency or Agencies – Eastern, Lake Hemet, Hemet
6 and San Jacinto.

7
8 1.25 Recharge or Replenish – to sink, spread or inject water
9 directly or indirectly underground in the Management Area.

10
11 1.26 Recharge Right – a Party's right to the use of Recharge Water.

12
13 1.27 Recharge Water – water used for Recharge.

14
15 1.28 Recycled Water – treated wastewater which is processed and
16 suitable for controlled use in the Management Area, including Recharge.

17
18 1.29 Replenishment Assessment – an acre-foot charge to be levied
19 against each Public Agency for water pumped in excess of the sum of its
20 respective Adjusted Production Right, its share of Imported Water, and applicable
21 Carry-Over Credits; and against each Class B Participant for pumping in excess
22 of its 1995-99 average production, i.e., its Base Production Right. Such
23 assessments shall be determined by the Watermaster to be used for
24 Replenishment Expenses.

25
26 1.30 Replenishment Expenses – Watermaster expenses for the
27 acquisition of Supplemental Water supplies, for land, and for the construction,
28 maintenance and operation of facilities necessary to replenish groundwater in the

1 Management Area, or otherwise to provide water to producers within the
2 Management Area.

3
4 1.31 Safe Yield – the long term, average quantity of water supply
5 in the Management Area that can be pumped without causing undesirable results,
6 including the gradual reduction of natural groundwater in storage over long-term
7 hydrologic cycles.

8
9 1.32 Settlement Agreement – that Agreement titled “The Soboba
10 Band of Luiseño Indians Settlement Agreement” among the Soboba Tribe, the
11 United States, as Trustee for the Tribe, Eastern Municipal Water District, Lake
12 Hemet Municipal Water District, and The Metropolitan Water District of
13 Southern California.

14
15 1.33 Soboba Tribe (sometimes the “Tribe”) – the Soboba Band of
16 Luiseno Indians.

17
18 1.34 Soboba Action – the lawsuit entitled Soboba Band of Mission
19 Indians, etc., v. Metropolitan, etc., et al, U.S. District Court, Central District of
20 California, Case No. 00-84208 GAF (MANx).

21
22 1.35 Storage Agreement – an agreement between Watermaster and
23 a Party to store Supplemental Water by sinking, spreading, injecting or in-lieu
24 procedures in the Management Area, and subsequently to recover such water,
25 without payment of Replenishment Assessments.

26
27 1.36 Storage Right – a Party's right to store and pump
28 Supplemental Water pursuant to a Storage Agreement.

1 1.37 Stored Water – Supplemental Water stored by a Party
2 pursuant to a Storage Agreement.

3
4 1.38 Surface Water – all water tributary to the Management Area
5 and flowing above the ground surface.

6
7 1.39 Supplemental Water – nontributary water imported into the
8 Management Area, including Imported Water and Recycled Water, and in-lieu
9 programs that reduce groundwater pumping.

10
11 1.40 Transfer – a temporary or permanent conveyance, assignment,
12 sale, contract or lease of part or all of a Party's Adjusted Production Right, Carry-
13 Over Credit, Storage Right or Recharge Right to any other Party, or a temporary
14 assignment, contract, lease or sale of part of the Soboba Tribe's quantified water
15 right.

16
17 1.41 Tribal Water Rights – the Soboba Tribe's rights to water set
18 forth in Section 4.1 of the Settlement Agreement and Section 5 of this Stipulated
19 Judgment.

20
21 1.42 Tunnel – the San Jacinto Tunnel in Riverside County,
22 California, constructed by Metropolitan in the 1930s.

23
24 1.43 Watermaster – the Board with the powers and duties defined
25 in Section 9.

26
27 1.44 Water Management Plan (sometimes the "Plan") – the Plan
28 adopted by the Watermaster, as it may be modified from time to time, to

1 implement the Physical Solution, to ensure an adequate and reliable source of
2 future water supply for the Management Area, and to protect the prior rights of
3 the Soboba Tribe.

4
5 2. EXHIBITS.

6
7 The following exhibits are attached to this Judgment and incorporated in it:

8
9 "A." Map of the Management Area and the Management Area Watershed.

10
11 "B." List of Parties to this Judgment.

12
13 "C." Description of each Public Agency's and Class B Participant's Base
14 Production Right.

15
16 3. PUBLIC AGENCIES' WATER RIGHTS.

17
18 3.1 Base Production Right. The Public Agencies are owners of
19 rights to pump groundwater from the Management Area as set forth in Exhibit
20 "C." These rights are for a calendar year and were calculated as follows:

21
22 3.1.1 The Base Production Right of Eastern is based upon its
23 respective average pumping for calendar years 1995-1999, less an adjustment of
24 1800 acre-feet for seepage from Metropolitan's San Jacinto tunnel, and for use of
25 Fruitvale water. The 1995-1999 period was chosen to reflect recent production
26 prior to the commencement of negotiations leading to this Stipulated Judgment.

1 3.1.2 The Base Production Right of Lake Hemet is based on
2 its average production for calendar years 1995-1999.

3
4 3.1.3 The Base Production Right of Hemet is based on its
5 average production for calendar years 1995-99, plus an adjustment of 900 acre feet
6 per year.

7
8 3.1.4 The Base Production Right of San Jacinto is based upon
9 its average Production for calendar years 1995-1999, plus 500 acre-feet per year,
10 and plus an adjustment of 900 acre feet per year. The 500 acre-feet per year has
11 been added because San Jacinto's recent pumping does not reflect its historic
12 production, due to water purchases and other factors.

13
14 3.1.5 The Base Production Rights of Hemet and San Jacinto
15 each include 900 acre-feet per year that have been added to their respective
16 amounts of pumping for calendar years 1995-1999. These amounts have been
17 added to provide Hemet and San Jacinto a fair share of water from, and to resolve
18 disputes regarding, Eastern's use of tunnel seepage, Eastern's use of Fruitvale
19 waters, and Lake Hemet's surface stream diversions. These additional amounts of
20 900 acre-feet per year shall be treated as the first amounts pumped by Hemet and
21 San Jacinto, shall not be subject to reduction by the Watermaster as provided in
22 Sections 3.2 to 3.2.2, and shall not be subject to any Administrative or
23 Replenishment Assessments as provided in Sections 3.3 to 3.3.2, or to any other fee
24 or charge imposed under the Management Plan.

25
26 3.2 Adjusted Production Rights. It is the goal of the Physical
27 Solution to adjust Base Production Rights over time on a pro-rata basis to a level
28 consistent with the Watermaster's determination of Safe Yield. The reduction

1 will be based on periodic demand, hydrology, recharge, and the community's
2 ability to pay for Supplemental Water, and protection of the Tribal Water Rights.
3 In order to implement this reduction in a phased manner, each Public Agency's
4 Base Production Right shall be subject to adjustment as follows:

5
6 3.2.1 Subject to Section 3.1.5, a 10% reduction from each
7 Base Production Right in the first full year after entry of this Judgment.

8
9 3.2.2 Until Adjusted Production Rights are consistent with the
10 Public Agencies' share of Safe Yield, Watermaster shall determine the required
11 reductions in Adjusted Production Rights in each subsequent year to achieve Safe
12 Yield within a reasonable period of time as determined by the Watermaster,
13 considering the extent of the overdraft, the economic impact on the Parties bound
14 by this Judgment, and other relevant factors. The goal is to achieve Safe Yield over
15 a six (6) year period assuming an annual overdraft of 10,000 acre feet. In the event
16 the extent of the overdraft is greater or lesser than assumed, then the period of time
17 reasonably required to reach Safe Yield may be extended or reduced accordingly.
18 However, in no event shall any reduction be more than 10% of the Adjusted
19 Production Rights of the prior year.

20
21 3.2.3 A party may pump in excess of its Adjusted Production
22 Right, without any additional Replenishment Assessment, by an amount equal to its
23 share of the 7,500 acre feet of Imported Water that is not used by the Tribe. The
24 amount of the Tribe's unused portion of the 7,500 acre feet shall be determined
25 annually by the Watermaster. This provision shall apply only during such period as
26 Imported Water is provided pursuant to Section 5.2 hereof. Shares of unused
27 Imported Water shall be allotted in proportion to Base Production Rights, and shall
28 be acquired and paid for pursuant to contract with Eastern.

1 3.2.4 A Base Production Right of a Public Agency serving the
2 land of a Class B Participant shall be increased in an amount equal to such
3 Participant's Base Production Right, adjusted and reduced pursuant to Sections
4 3.2.1 and 3.2.2, when the Participant's land is converted from agricultural use to
5 water service from the Public Agency, pursuant to Section 4.4.3.
6

7 3.2.5 The Adjusted Production Rights of the Public Agencies
8 may be increased by the Watermaster on a prorata basis to the extent that pumping
9 by Class A participants, or pumping by persons not parties to this Judgment, may
10 decrease, and the Watermaster finds that achieving the goal of maintaining the
11 Management Area in a Safe Yield condition can still be met.
12

13 3.3 Public Agency Production Assessments. Public Agency
14 pumping shall be subject to the following assessments:
15

16 3.3.1 An Administrative Assessment as provided in Section
17 1.2 . The Administrative Assessment will be \$50.00 per acre-foot of water pumped
18 in the first full year after entry of this Judgment, and such amount thereafter will be
19 set by the Watermaster.
20

21 3.3.2 A Replenishment Assessment as provided in Section
22 1.29. Pumping by a Public Agency in excess of the sum of its Adjusted Production
23 Right, its share of Imported Water, and applicable Carry-Over Credits in order to
24 meet increasing demands is permissible, provided that such excess extractions shall
25 be subject to Replenishment Assessments.
26

27 3.4 Surface Rights. Eastern holds License Number 016667 from
28 the State Water Resources Control Board to divert, spread and recover surface

1 flows of the San Jacinto River within the Management Area. Lake Hemet holds
2 pre-1914 appropriative rights to divert and store surface flows in Lake Hemet,
3 and to divert surface flows tributary to but outside of the Management Area from
4 Strawberry Creek and from the North and South Forks of the San Jacinto River.
5 All Parties acknowledge such Eastern and Lake Hemet rights, and the fact that
6 they are not subject to any assessments under this Judgment; provided that any
7 water pumped by Eastern under its License shall be included in its Adjusted
8 Production Right.

9
10 3.5 Fruitvale Judgment, Sale of Assets, and Agreements. The
11 Court hereby finds that Eastern purchased all of the water rights and assets of the
12 Fruitvale Mutual Water Company ("Fruitvale") pursuant to the Agreement
13 described in Section 1.11(b) hereof, and is now the owner thereof. Eastern, as the
14 successor in interest to Fruitvale, is also a defendant in the action described in
15 Section 1.11(a) hereof. The Court finds that the only other remaining party in
16 such action is the plaintiff City of San Jacinto. The Court retained continuing
17 jurisdiction in such action, and Eastern has made annual reports pursuant to the
18 Fruitvale Judgment. Pursuant to stipulation between Eastern and San Jacinto, and
19 in accord with the physical solution and terms of this Judgment, the Court hereby
20 finds that the rights and obligations of the Fruitvale Judgment have been
21 subsumed in, and superseded by, this Judgment and are no longer enforceable;
22 that the limitations upon the place and amounts of water use in the Fruitvale
23 Judgment, the sale Agreement, and the Agency Agreements described in Sections
24 1.11(a), (b), (c) are no longer applicable or enforceable; and that the continuing
25 jurisdiction of the Court under the Fruitvale Judgment, and the obligation of
26 Eastern to report thereunder, are hereby terminated; provided, however, that none
27 of the service area agreements included in the Fruitvale documents in Section
28

1 1.11, or any other agreements related to mutual aid, system interties, or service
2 areas, shall be affected by this Judgment.

3
4 3.6 Fruitvale Agency Rights. The water rights of Hemet, San
5 Jacinto and Lake Hemet under the several agreements with Eastern described in
6 Section 1.11(c) hereof have been incorporated in their respective Base Production
7 Rights under this Judgment.

8
9 4. PRIVATE PUMPERS' WATER RIGHTS

10
11 4.1 Recognition of Rights. The Private Pumpers are owners of
12 Overlying or other water rights to pump from the Management Area. The Public
13 Agencies recognize these rights, and do not intend to take or adversely impact
14 these rights without an agreement with the owner of such rights. There is no
15 intent to affect water use that is consistent with the historical use of the Private
16 Pumpers.

17
18 4.2 Non-Participation. A Private Pumper can elect not to
19 participate in the Water Management Plan and not to formally acknowledge its
20 existence. Such Pumpers are referred to as Non-Participants. Non-Participants
21 shall continue to exercise whatever water rights they may hold under California
22 law unaffected by the Plan. However, the Parties do not waive their rights to
23 challenge any new or expanded use of water or water rights. Non-Participants
24 will not have the option of intervening as a party under the Judgment at a later
25 date.

26
27 4.3 Class A Participation. A Private Pumper can stipulate to be a
28 party to the Judgment as a Class A Participant under the following terms:

1 4.3.1 A Class A Participant approves this Physical Solution
2 and may vote for and/or be elected to serve as the Private Pumper representative on
3 the Watermaster, but other than Section 4.3.4 shall not otherwise have any
4 obligation for the implementation of the Physical Solution or the Water
5 Management Plan.

6
7 4.3.2 A Class A Participant may, without any assessment by
8 the Watermaster, pump from the Participant's property within the Management
9 Area the amount of water that can be put to reasonable and beneficial use in the
10 Participant's historic place of use or as authorized under California law.

11
12 4.3.3 A Class A Participant shall have the right to convert to
13 Class B Participation during a grace period that shall end 3 years after the entry of
14 this Judgment, and upon payment of the total assessments, without interest, that the
15 Class A Participant would have paid had the Class A Participant elected to be a
16 Class B Participant from the outset.

17
18 4.3.4 A Class A Participant hereby authorizes the installation
19 of water meters, and the collection and reading of Groundwater production, level
20 and water quality data from the Class A Participant's well(s) by personnel
21 authorized by the Watermaster. The metering, meter reading, and other related
22 monitoring efforts shall be at no cost to the Class A Participant, and the Class A
23 Participant shall receive copies of the reports and information obtained upon
24 request.

25
26 4.3.5 The Stipulation signed by a Class A Participant shall
27 describe or otherwise identify the Participant's land and wells within the
28 Management Area. The heirs, successors and assigns of such land and wells shall

1 succeed to the benefits of the Participant's rights under the Judgment, and be bound
2 by the obligations thereof, provided that such successor intervenes as a party under
3 the Judgment. Absent such intervention, the successor will be treated as a Non-
4 Participant.

5
6 4.4 Class B Participation. A Private Pumper can stipulate to be or
7 intervene as a party under the Judgment as a Class B Participant on the following
8 terms:

9
10 4.4.1 A Class B Participant's annual pumping shall be limited
11 to average annual Production during the calendar years 1995 through 1999, less any
12 amount of water that had been used on land that was developed for non-agricultural
13 purposes after 1999, which is the Participant's Base Production Right. The Class B
14 Participant shall pay Replenishment Assessments on amounts in excess of its Base
15 Production Right. A Class B Participant shall not be subject to Administrative
16 Assessments, and until conversion to a Public Agency, such Base Production Right
17 shall not be subject to reduction to Safe Yield. In the absence of production history
18 for this period, the Watermaster, using all available information including power
19 consumption records and records of water use by similar farming operations in the
20 area, will estimate the average annual production for the Participant.

21
22 4.4.2 The Class B Participant approves this Physical Solution
23 and may vote for and/or be elected to serve as the Private Pumper's representative
24 on the Watermaster;

25
26 4.4.3 Upon conversion of a Class B Participant's land from
27 agricultural to a use that requires water service from a Public Agency, the Public
28 Agency shall credit, to the extent legally permissible, the Class B Participant's Base

1 Production Right, adjusted pursuant to the percentage reductions in Sections 3.2.1
2 and 3.2.2, against any requirement then in effect for any water supply assessment
3 requirements, or against any fees associated with water supply that the Public
4 Agency may then have in effect. The Public Agency serving the converted land
5 shall receive a credit added to its Base Production Right as set forth in Section
6 3.2.4.

7
8 4.4.4 A Class B Participant is eligible to enter into a contract
9 with the Watermaster, or a participating Public Agency, to sell for a defined period
10 of time the unused portion of the Class B Participant's Base Production Right,
11 under terms and conditions approved by the Watermaster. Criteria used in
12 consideration of such contract shall include:

13
14 4.4.4.1 The Water Management Plan's need to acquire
15 additional water supplies to address overdraft and recovery;

16
17 4.4.4.2 Submission of a water conservation plan,
18 including use of in lieu water, by the Class B Participant that will reasonably
19 guarantee conservation of water that would otherwise be produced from the
20 Management Area; and the amount of conserved water transferred reflects a
21 reduction pursuant to Sections 3.2.1 and 3.2.2.

22
23 4.4.4.3 Public policy considerations of local
24 government jurisdictions, including economic, land use and community impacts of
25 any proposed water conservation plan.

26
27 4.4.5 The Class B Participant hereby authorizes the installation
28 of meters and the collection and reading of Groundwater production, water level

1 and water quality data from the Class B Participant's well(s) by personnel
2 authorized by the Watermaster. The metering, meter reading and other related
3 monitoring efforts shall be at no cost to the Class B Participant, and the Class B
4 Participant shall receive copies of the reports and information obtained upon
5 request.

6
7 4.4.6 The Stipulation signed by a Class B Participant shall
8 describe or otherwise identify the Participant's land and wells within the
9 Management Area. The heirs, successors and assigns of such land and wells shall
10 succeed to the benefits of the Participant's rights under the Judgment, and be bound
11 by the obligations thereof, provided that such successor intervenes as a party under
12 the Judgment. Absent such intervention, the successor will be treated as a Non-
13 Participant.

14
15 4.5 In-Lieu Water Use. In the event a Private Pumper receives
16 Supplemental Water from a Public Agency to serve an historic use in place of
17 Groundwater, or otherwise engages in an in-lieu program, the Overlying Right of
18 the Private Pumper shall not be diminished by the receipt and use of such
19 Supplemental Water or by engaging in an in-lieu program.

20
21 4.6 Future Production Participation. Any new pumper after the
22 entry of this Judgment may intervene in this action and Judgment only as a Class
23 A Participant.

24
25 4.7 Replacement Wells. Re-drilling of existing wells and the
26 drilling of new wells to replace existing wells will not be considered new
27 production as provided in Section 4.6.

1 5. TRIBAL WATER RIGHTS

2
3 The Tribal Water Rights will be determined as part of a settlement
4 among the Soboba Tribe, the United States, Eastern, Lake Hemet and Metropolitan.
5 The settlement will be reflected in a Settlement Agreement, Congressional
6 legislation and appropriation of funds, and a Judgment in the Soboba Action. Such
7 settlement includes the following provisions, which shall be effective only upon
8 fulfillment of all of the conditions precedent set forth in Article 3 of the Settlement
9 Agreement, a copy of which is attached hereto.

10
11 5.1 Senior Right. The Soboba Tribe shall have a prior and
12 paramount right, superior to all others, to pump 9000 acre-feet per year (3000
13 acre feet from the Canyon Subbasin and the remainder from a portion of the San
14 Jacinto Upper Pressure Subbasin referred to as the Intake Subbasin), for use on
15 the Reservation, as defined in Article 2.20 of the Settlement Agreement, and on
16 lands now owned or hereafter acquired by the Soboba Tribe contiguous to the
17 Reservation or within the Canyon and Intake Subbasins; provided, however, that
18 such use shall be limited to 4100 acre-feet per year for the first 50 years after the
19 Effective Date as set forth in the Settlement Agreement. The Tribe's right to
20 pump applies to all Groundwater, whether replenished by Natural Recharge or by
21 Supplemental Water. In addition, the Tribe shall have the right to purchase
22 additional water from the Watermaster during the fifty years that its use is limited
23 to 4,100 AFA at the rate then being charged to the Public Agencies under the
24 Water Management Plan. In the event the Soboba Tribe is unable, except for
25 mechanical failure of its wells, pumps or water facilities, to produce from its
26 existing wells or equivalent replacements up to 3000 AFA production from the
27 Canyon Sub-basin and the remainder of its Tribal Water Rights from the Intake
28 Sub-basin, Eastern and Lake Hemet shall deliver any shortage to the Soboba

1 Tribe as provided in Section 4.1C of the Settlement Agreement. Pumping for
2 such purpose shall not be subject to Administrative or Replenishment
3 Assessments, and shall not be counted as part of Adjusted Production Rights.
4

5 5.2 Metropolitan Water. The Soboba settlement provides, among
6 other matters, that Metropolitan will use its best efforts to deliver sufficient
7 Imported Water to yield 7,500 acre-feet per year, based upon 15 year averages,
8 for recharge in the Management Area at its untreated replenishment water rate, or
9 any successor rate as provided in Section 4.4A of the Settlement Agreement.
10

11 5.3 Settlement Payment. Subject to the Effective Date of the
12 Settlement Agreement and funding by the United States, Eastern pursuant to the
13 terms set forth in the Water Management Plan, will pay the Soboba Tribe \$17
14 million dollars pursuant to Article 4.7A of the Settlement Agreement in
15 consideration, in part, of the Tribe's agreement to limit its water use up to 4,100
16 acre-feet per year for the first 50 years after the Effective Date according to the
17 build-up schedule set forth in the Settlement Agreement as Exhibit I. Subject to
18 contracts with Eastern, the Public Agencies shall have the right to pump and use
19 all Imported Water not used by the Tribe, and the unused portion of the Tribal
20 Water Rights shall be available for use by the Parties, pursuant to their rights
21 herein.
22

23 5.4 Capital Facilities. Eastern on behalf of the Water
24 Management Plan participants will receive \$10 million from the United States, to
25 be applied to the costs of constructing and operating the Phase I capital facilities
26 necessary to import and recharge Supplemental Water as described in the Plan.
27 Additional grant funds from the State of California or the United States may also
28 be available for such capital facilities. The rights of the Public Agencies to the

1 use of such facilities will be affirmed by contract as set forth in Sections 9.6.4(a)
2 and 9.6.4(c).

3
4 5.5 Acknowledgement of Soboba Tribe Settlement. The Parties
5 to this Judgment hereby recognize the Tribal Water Rights, as set forth above,
6 and the applicable provisions of the Soboba Tribe Settlement Agreement, and
7 acknowledge that protection of Tribal Water Rights is one of the goals of the
8 Water Management Plan.

9
10 6. PHYSICAL SOLUTION.

11
12 6.1 Purpose and Objective. Pursuant to California water law and
13 the California Constitution, Article X, Section 2, the Court adopts this Physical
14 Solution to maximize reasonable beneficial use of Surface Water, Groundwater
15 and Supplemental Water for water users in or dependent upon the Management
16 Area, to eliminate overdraft, to protect the prior rights of the Soboba Tribe, and to
17 provide the Parties with the substantial enjoyment of their respective rights,
18 including, the priorities thereof.

19
20 6.2 Need for Flexibility. In order to adapt to potential changes in
21 hydrology, land use, and social and economic conditions, the Physical Solution
22 must provide some degree of flexibility and adaptability. Accordingly, the Court
23 retains broad jurisdiction to supplement the discretion granted to the
24 Watermaster.

25
26 6.3 Rights to Groundwater. Groundwater in the Management
27 Area may occur from: natural recharge; spreading operations of natural flows;
28 recharge with Supplemental Water acquired with Assessment funds; return flows,

1 following or in-lieu recharge programs financed with Assessment funds. All such
2 Groundwater shall be available to support the pumping of the Parties as allowed
3 herein, and shall not be the property of any individual Party. Subject to the
4 provisions of Section 6.7.2, this Section does not preclude any Party, pursuant to
5 a Storage Agreement, from storing Supplemental Water at its own cost, retaining
6 title thereto, and pumping such water without Assessment.

7
8 6.4 Resolution of Priorities. By reason of the long and continuous
9 overdraft of the Management Area, the contribution of all parties to the overdraft,
10 the economies that have developed on the basis of the overdraft, the severe
11 economic disruption that could occur under strict priorities and the doctrines of
12 prescription and laches, the complexity of determining appropriative priorities,
13 and the need to make the maximum beneficial use of the water resources of the
14 State, the Parties are estopped and barred from asserting specific priorities or
15 preferences to the pumping of groundwater in the Management area, except as
16 provided in this Judgment, and the Court finds that the provisions of this
17 Judgment provide for the substantial enjoyment of the respective rights of the
18 Parties.

19
20 6.5 Water Management Plan. The Watermaster will approve and
21 implement a Water Management Plan to enforce and implement the Physical
22 Solution, and may modify such Plan as conditions require, subject to the
23 provisions of the Settlement Agreement. The Plan will also facilitate and
24 accommodate the settlement of the water rights of the Soboba Tribe, and shall be
25 subject to the approval of the Soboba Tribe and the United States as trustee for
26 the Tribe. The Parties agree that the Plan shall incorporate and serve to
27 implement the following goals:
28

1 6.5.1 Groundwater levels within the Management Area have
2 generally been declining for a number of years, and the Management Area is
3 presently in a condition of Overdraft. The Plan will, within a reasonable period,
4 eliminate Groundwater Overdraft and provide for excess production by
5 implementing a combination of available water resources management elements.
6 These elements include: reduction in natural Groundwater production; enhanced
7 Recharge with native and/or Supplemental Water; increased use of recycled water;
8 in-lieu replenishment; acquisition and development of Supplemental Water; and
9 water conservation programs.

10
11 6.5.2 The Management Area is expected to experience
12 residential, commercial, and industrial growth and development over the next
13 decade. The estimated amount of Supplemental Water that will be necessary to
14 provide for and adequately serve this new growth and development is 15,000 acre
15 feet per year. The Water Management Plan shall accommodate the orderly
16 expansion of existing water production and service systems, and provide a clear
17 planning process for meeting these projected growth trends.

18
19 6.5.3 The Plan should be implemented in a manner to protect
20 and/or enhance Management Area water quality. However, implementation of
21 certain elements of the Plan may cause limited localized water quality degradation.
22 If such degradation impedes the then current beneficial uses of water by any Public
23 Agency in the Management Area, the Watermaster shall implement appropriate
24 mitigation measures to ensure the water supply to the affected Public Agency, and
25 to bear the associated costs. The standards for local water quality degradation shall
26 be defined in the Plan.

1 6.5.4 The Water Management Plan should serve to support the
2 pursuit of cost-effective water supply and water treatment by the Public Agencies,
3 both individually and collectively.

4
5 6.5.5 The Water Management Plan should serve to protect
6 Tribal Water Rights.

7
8 6.5.6 The Watermaster shall implement a monitoring program
9 to ensure that Plan activities follow best management and engineering principles to
10 protect Management Area water resources, and to compile and analyze data on
11 groundwater production, water levels, water quality and groundwater in storage.

12
13 6.6 Replenishment Program. The groundwater replenishment
14 program shall be administered by the Watermaster. The program shall include:
15 the acquisition of Supplemental Water; the collection and expenditure of
16 Replenishment Assessments; the recharge of the Management Area; and the
17 construction and operation of all necessary facilities, including but not limited to,
18 development of surface and sub-surface percolation and injection facilities. In
19 addition, a source of Recharge Water for agencies contributing to the Settlement
20 Payment described in Section 5.3 will be Imported Water provided by
21 Metropolitan under the Settlement Agreement, and not used by the Soboba Tribe.

22
23 6.6.1 Priority for replenishment will be based on an equitable
24 apportionment of available replenishment water among the sub-basins after full
25 consideration of:

26
27 6.6.1.1 The Public Agency's participation in the
28 payment in the Settlement Payment described in Section 5.3.

1 6.6.1.2 Hydrologic conditions in the Management
2 Area.

3
4 6.6.1.3 The Management Area's Water demands.

5
6 6.6.1.4 The availability of storage capacity to
7 accommodate the Natural Recharge of surface flows.

8
9 6.6.1.5 The availability of appropriate conveyance
10 facilities.

11
12 6.6.1.6 The availability of Supplemental Water,

13
14 6.6.1.7 Protection of Tribal Water Rights.

15
16 6.6.2 The Watermaster is encouraged to take advantage of
17 surplus imported water from Metropolitan that occasionally may be available at low
18 cost, and to use available Assessment funds to bank such Recharge Water against
19 future production in excess of Adjusted Production Rights.

20
21 6.6.3 The Public Agencies shall independently or jointly
22 operate their present facilities to maximize the existing spreading and Recharge
23 operations of natural flow in the Management Area. Such Recharge Water shall be
24 available to support the pumping of all users, and shall not be the property of the
25 spreading Public Agency.

26
27 6.6.4 All water used to replenish any sub-basin in the
28 Management Area shall meet the Regional Water Quality Control Board, Santa Ana

1 Region requirements, and the provisions of Article 4.2 of the Settlement
2 Agreement, and may be used in any sub-basin where such requirements are met.

3
4 6.7 Storage Rights. Unused storage capacity may exist in the
5 Management Area, and this capacity will be managed by the Watermaster
6 conjunctively with natural and available Supplemental Water supplies.

7
8 6.7.1 Subject to availability of Assessment funds and unused
9 storage capacity as determined by Watermaster, the Management Area may be
10 Recharged when water is available, to be drawn upon by the Public Agencies in
11 later years when such Supplemental Water may not be available.

12
13 6.7.2 Unused storage capacity, as determined by Watermaster,
14 and pursuant to a Storage Agreement, may be used for “put and take” operations of
15 Supplemental Water that is paid for by any Public Agency provided that:

16
17 6.7.2.1 Such operations do not interfere with the rights
18 of any other pumper, or with the use of the storage capacity for recharge and
19 storage under the Water Management Plan.

20
21 6.7.2.2 The Watermaster shall have the first right to
22 purchase any water available for Recharge for use under the Plan.

23
24 6.7.2.3 Later recovery of Stored Water shall exclude
25 losses, and shall not be subject to either Administrative or Replenishment
26 Assessments.

1 6.7.2.4 Such recovered water may be used anywhere
2 within the service area of the Party.

3
4 6.7.2.5 Such Stored Water may be transferred while
5 still in storage.

6
7 6.7.3 Any conjunctive use programs for the benefit of territory
8 outside of the Management Area shall be subject to the Watermaster and the
9 governance provisions herein. Any storage, conjunctive use programs by third
10 parties, or in-lieu recharge programs financed with assessment funds, shall be
11 subject to the Watermaster and the governance provisions herein; provided that
12 Metropolitan has the right under the Soboba Settlement Agreement to use up to
13 40,000 acre-feet of storage capacity in the San Jacinto Upper Pressure Sub-basin for
14 the pre-delivery of water required under Section 5.2.

15
16 6.7.4 Eastern and Lake Hemet have previously provided water
17 for replenishment of the Management Area. As of May 1, 2005 these amounts, less
18 losses, were 12,694 acre-feet for Eastern and 950 acre-feet for Lake Hemet. Such
19 Parties shall have Recharge Rights to recover these amounts, less any future losses,
20 without either Administrative or Replenishment Assessments, and may be used to
21 offset excess pumping in lieu of Replenishment Assessments. The water available
22 under such Recharge Rights shall be pumped within 15 years of the entry of this
23 Judgment, but at not more than 2000 acre-feet in a single year. The Public
24 Agencies shall notify the Watermaster when such Recharged Water is being
25 pumped, and in what amounts, and the Watermaster shall keep an accounting of the
26 amounts remaining. The use of such credits shall be interpreted and administered
27 so as not to increase the replenishment obligations or assessments of those parties
28 without such past credits, or after such credits have been fully used.

1 6.7.5 The accounting for recovery of Stored Water or
2 Recharge Water from the Management Area shall not include any water that
3 escapes therefrom and migrates downstream beyond the Management Area. Losses
4 will be calculated based upon best engineering principles.
5

6 6.8 Recycled Water. The use of Recycled Water produced by
7 Eastern can be of substantial benefit in providing additional water in the
8 Management Area. The Watermaster shall have a right of first refusal to
9 purchase all recycled water produced from treatment facilities serving the
10 Management Area that is not subject to then existing contracts. Such recycled
11 water may be used for recharge or direct use within the Management Area..
12

13 6.8.1 Each Public Agency may implement its own Recycled
14 Water program, for direct use, subject to the availability of recycled water. The
15 Public Agency shall be responsible for financing, operating and maintaining the
16 facilities necessary for that program. The Watermaster will support loan or grant
17 applications, and the Public Agencies will work to integrate Recycled Water into
18 the Water Management Plan, to the extent economically feasible while meeting
19 regulatory standards.
20

21 6.8.2 Currently only Eastern has Recycled Water available for
22 Recharge. To the extent such Recycled Water is not acquired by the Watermaster
23 for use under the Plan, the water if recharged in the Management Area shall remain
24 the property of Eastern and may be pumped (less losses) without Replenishment
25 Assessments.
26
27
28

1 6.9 Assessment Program. The assessment program contemplated
2 by the Water Management Plan shall be administered by Eastern pursuant to a
3 contract with the Watermaster pursuant to the provisions of Section 9.6.4(e).

4
5 6.9.1 All Assessments shall be used for Replenishment
6 Expenses and Administrative Expenses.

7
8 6.9.2 Subject to the limitations in this Judgment, each Public
9 Agency that produces less than its Adjusted Production Right and share of Imported
10 Water, and any Class B Participant producing less than its Base Production Right,
11 shall have the following Carry-Over Credit:

12
13 6.9.2.1 Carry-Over Credit shall be the difference in
14 acre-feet between a Party's Adjusted Production Right and share of Imported Water,
15 or the Class B Participant's Base Production Right, and the Party's actual
16 production in a calendar year.

17
18 6.9.2.2 The Carry-Over Credit may be applied to
19 reduce the amount of acre feet upon which a Party must pay a Replenishment
20 Assessment. Carry-Over Credits are transferable among the Parties, and may be
21 retained for more than one calendar year. The Parties shall notify the Watermaster
22 if a Carry-Over Credit is being retained.

23
24 6.9.2.3 The Watermaster shall keep an accounting of
25 all Carry-Over Credits.

26
27 6.9.3 All Watermaster assessment invoices shall be payable to
28 Watermaster within 60 days of notice. Any delinquent assessments shall bear

1 interest at a rate to be set by the Watermaster. Watermaster is entitled to recover its
2 reasonable expenses in collecting any assessment, including attorney's fees and
3 costs.

4
5 6.10 Export. The Public Agencies may export water outside the
6 Management Area, on a temporary basis, upon approval by the Watermaster.
7 However, any water exported shall be replenished with an appropriate amount of
8 similar or better quality water as determined by Watermaster. Water exports by
9 the Public Agencies shall not interfere with the Water Management Plan or any
10 other Public Agency's operations. The Water Management Plan will set forth the
11 specific criteria for the export of water, including, but not limited to, conjunctive
12 use programs.

13
14 6.11 Capital Facilities. Each Public Agency shall continue to own
15 its existing capital facilities for water supply and management, subject to the
16 provisions of Section 9.6.6. However, the Phase I capital facilities necessary to
17 implement the Water Management Plan shall be owned and operated by Eastern,
18 pursuant to the Plan and in a fiduciary capacity for the benefit of all Parties under
19 this Judgment, pursuant to Sections 5.4; 9.6.4(a); 9.6.4(c).

20
21 6.11.1 Financing of Water Management Plan facilities may be
22 funded by Assessments, regional capital fees, loans and grants, contributions for
23 storage rights by Metropolitan or other third-parties, and municipal bonds.
24 Responsibility for the costs of future capital facilities necessary to implement the
25 Plan, beyond the Phase I facilities, shall be determined by the Watermaster and
26 apportioned on relative benefit to be derived by each Public Agency.

1 6.11.2 Any of the participating Public Agencies may propose
2 projects to be included in the Water Management Plan to increase the Management
3 Area water supply. Such proposals, after evaluation by the Watermaster, shall be
4 included or rejected. If the Watermaster chooses to reject the proposal, the
5 proposing Public Agency may implement the rejected project at its own cost so
6 long as it does not significantly impact the implementation of the Management Plan
7 and/or interfere with the ongoing production by the Public Agencies.
8

9 7. INJUNCTION.
10

11 Each Party and his, her or its officers, agents, employees, successors
12 and assigns, is enjoined and restrained from:
13

14 7.1 Producing water from the Management Area without payment
15 of required Administrative Assessments.
16

17 7.2 Producing water from the Management Area in excess of the
18 Party's Adjusted Production Right and share of Imported Water, or the Base
19 Production Right in the case of a Class B Participant, without payment of
20 required Replenishment Assessments.
21

22 7.3 Transferring Production Rights except as authorized in this
23 Judgment.
24

25 7.4 Recharging water in the Management Area except as
26 authorized in this Judgment.
27
28

1 7.5 Storing or exporting water except as authorized in this
2 Judgment.

3
4 8. CONTINUING JURISDICTION.

5
6 8.1 Full Jurisdiction. Full jurisdiction, power and authority is
7 reserved to the Court as to all matters contained in this Judgment, including
8 expedited intervention by successors in interest to Private Pumpers, except:

9
10 8.1.1 To redetermine Base Production Rights of the Public
11 Agencies or Class B Participants.

12
13 8.1.2 As otherwise limited by law.

14
15 8.2 Motion to Interpret. By motion to the Court, upon 30 days
16 written notice and after hearing, any Party or Watermaster may request the Court
17 to make such further or supplemental orders to interpret, enforce, carry-out or
18 amend this Judgment. Any such motion shall be reviewed de novo by the Court.
19 Any such motion shall be served on all Parties and Watermaster at the addresses
20 on the Watermaster's notice list.

21
22 9. WATERMASTER.

23
24 9.1 Composition. The Watermaster shall consist of a board
25 composed of one elected official selected by each of the Public Agencies and one
26 Private Pumper representative selected by the Class A and Class B Private
27 Pumpers.

1 9.2 Terms. Each member of the Watermaster shall serve until
2 replaced by the Public Agency or Private Pumpers that made the original
3 appointment.

4
5 9.3 Removal and Replacement. Any Watermaster member may
6 be removed and replaced by the same procedure used in his or her appointment.

7
8 9.4 Voting. Each member of the Watermaster shall have one
9 vote. Four affirmative votes shall be required in order to constitute Watermaster
10 action on each of the following matters. (1) any change sought in the form of
11 governance; (2) any change in voting requirements; (3) retaining the services of
12 legal counsel and Advisor; (4) establishing, levying, increasing or decreasing all
13 assessment amounts; (5) adopting or amending an annual budget; (6) determining
14 the extent of overdraft and quantifying safe yield; (7) determining Adjusted
15 Production Rights; (8) decisions regarding the financing of Supplemental Water
16 or facilities, other than any financing provisions included in this Stipulated
17 Judgment as provided in Sections 5.3, 5.4, 5.5 hereof; (9) decisions regarding
18 ownership of facilities, other than ownership of the Phase I facilities described in
19 the Water Management Plan, which shall be owned by Eastern Municipal Water
20 District, subject to a right of use by those parties participating in the financing
21 thereof; (10) policies for the management of the Management Area; (11) and any
22 decision that involves a substantial commitment by the Watermaster, including
23 any contracts for conserved water. All other actions by the Watermaster shall
24 require three affirmative votes.

25
26 9.5 Court Review. Any action by the Watermaster, or any failure
27 to act by virtue of insufficient votes, may be reviewed by the Court on motion by
28

1 any party, with notice to all other parties. The Court's review shall be de novo,
2 and the Court's decision shall constitute action by the Watermaster.

3
4 9.6 Powers and Duties. In order to implement the provisions of
5 this Judgment, the Watermaster shall have the following duties and powers:

6
7 9.6.1 Water Management Plan. Watermaster shall develop
8 and implement a Water Management Plan, with such additions and modifications as
9 may from time to time be appropriate, and shall administer the provisions of this
10 Judgment. The Water Management Plan shall be subject to approval by the Court,
11 by the Soboba Tribe, and by the United States.

12
13 9.6.2 Independent Counsel. The Watermaster shall retain
14 independent legal counsel to provide such legal services as the Watermaster may
15 direct.

16
17 9.6.3 Advisor. The Watermaster shall retain either an
18 independent engineering firm or qualified individual experienced in hydrology to
19 evaluate and analyze the data collected by Eastern, and any conclusions based
20 thereon, and to make recommendations to the Watermaster, referred to herein as
21 "Advisor." The Advisor shall also provide general coordination among Eastern, the
22 Technical Advisory Committee and the Watermaster with respect to their respective
23 functions, and perform such executive functions as the Watermaster may direct.
24 The Watermaster reserves the right to refer any matter it may choose to any person
25 it may select for assistance in carrying out its duties under this Judgment.

1 9.6.4 Operations and Other Functions.

2
3 (a) *Operations – Phase I Facilities.* The Phase I Facilities
4 (including capital facilities and spreading basins, as more particularly defined in the
5 Water Management Plan) are either existing facilities of Eastern that will be
6 expanded or improved as part of the Water Management Plan, or are new facilities
7 that will be integrated into Eastern’s existing facilities and will be owned by
8 Eastern. Pursuant to the terms and conditions of contracts to be entered into
9 between Eastern and the Watermaster, and Eastern and the other Public Agencies,
10 Eastern shall construct, install, and operate the Phase I Facilities consistent with the
11 Water Management Plan.
12
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15
16 (b) *Operations – Other Facilities.* The Water Management Plan
17 anticipates the need for the construction and installation of other facilities in order
18 to accomplish the goals of the Judgment. Such facilities may be constructed,
19 installed and operated under contract with the Watermaster, by a member of the
20 Watermaster or, in circumstances approved by the Watermaster, by other
21 responsible entities.
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24

25 (c) *Purchase of Water for Groundwater Recharge.* The Soboba
26 settlement requires Metropolitan to use its best efforts to deliver an average of 7500
27
28

1 acre-feet per year of Imported Water for recharge of the Management Area. This
2 supply is dedicated first to satisfy the rights of the Soboba Tribe as provided in the
3 Settlement Agreement. Such portion of the supply that is not used by the Soboba
4 Tribe will be available to those Parties who have participated in the cost thereof.
5 Subject to the approval of the Watermaster, Eastern shall enter into a contract with
6 Metropolitan for the purchase and delivery of such Imported Water supply. Eastern
7 shall also purchase as a member agency of Metropolitan, or otherwise acquire, such
8 additional supplies of water as may be directed by the Watermaster to implement
9 the Water Management Plan, subject to availability and transmission capacity. All
10 such water delivered by Metropolitan, or otherwise acquired by Eastern, and all
11 Eastern facilities used to deliver, recharge and recapture such water, shall be subject
12 to rights of use by the Parties entitled thereto. Such rights of use shall be confirmed
13 in detail in written contracts with Eastern. Recycled water is also available for direct
14 and indirect groundwater recharge from Eastern's wastewater treatment facilities
15 serving the Management Area. The Watermaster shall have a right of first refusal
16 to purchase all recycled water produced from such plant that is not subject to then
17 existing contracts. Nothing contained herein shall limit the right of the
18 Watermaster to acquire Imported or Supplemental Water supplies from any of the
19 Parties, or from other responsible entities.
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27 (d) *Data Collection.* The Watermaster shall provide for the
28 collection and maintenance of all production, water level, water quality, and other

1 technical data necessary under or required by the Water Management Plan
2 (“Data”). Pursuant to the terms and conditions of a contract to be entered into
3 between Eastern and the Watermaster, Eastern shall collect and maintain all such
4 Data and transmit such Data to the Watermaster, its Advisor, and the Technical
5 Advisory Committee as directed by the Watermaster. The foregoing clause does not
6 restrict the ability of the Watermaster to enter into other agreements with other
7 members of the Watermaster and/or private firms and individuals for the collection
8 of Data.

9
10 (e) *Accounting*. The Watermaster shall provide for the levy, billing,
11 and collection of all assessments provided for under the Judgment, for the payment
12 of costs and expenses of the Watermaster, and for the performance of such
13 accounting and related functions as may be required in connection with those
14 functions (“Accounting Functions”). All funds collected shall be held in a
15 segregated account. All expenses and disbursements shall be separately accounted
16 for. Pursuant to the terms and conditions of a contract to be entered into between
17 Eastern and the Watermaster, Eastern shall initially perform the Accounting
18 Functions for Watermaster. The foregoing clause does not restrict the ability of the
19 Watermaster to enter into other agreements with other members of the Watermaster
20 and/or private firms and individuals to provide some or all of the Accounting
21 Functions.

22 9.6.5 Technical Advisory Committee. There has been a
23 Technical Advisory Committee that has functioned throughout the development of
24 the Water Management Principles and Plan, and this Stipulated Judgment. That
25 Committee has been composed of such managerial and technical representatives as
26 the individual parties decide to appoint. Each party has paid the costs of its own
27 representatives, and shall continue to do so in the future. The Technical Advisory
28 Committee shall continue to function, and to provide such technical assistance as

1 the Watermaster may request. The Technical Advisory Committee shall make
2 recommendations to the Watermaster's Advisor and to the Watermaster on all
3 matters requiring four votes for Watermaster action, and shall receive from Eastern
4 all data associated with such matters for its review and evaluation. The Technical
5 Advisory Committee and its members shall also function as a way to keep the City
6 Councils, Boards of Directors and participating Private Pumpers fully informed
7 about the implementation of this Judgment.

8
9
10 9.6.6 Reservation of Rights. The Watermaster reserves the
11 right to assume, on its own, any functions set forth in Section 9.6.4, except as
12 provided in Section 9.6.4(a), and to undertake all other acts required to implement
13 the Plan and this Judgment, so long as it is legally capable of performing such
14 functions. The Watermaster, if it should choose, may also act through or in
15 conjunction with the other Public Agencies, or through a Joint Powers Agency
16 composed of all the Public Agencies hereunder. Except as specifically provided in
17 Section 9.6.4(a) with respect to Eastern's facilities used in Phase I, the Watermaster
18 shall have no right to use or acquire the water facilities of any of the Parties,
19 without their consent, provided that it is the intent of the Parties that their individual
20 facilities will be available where appropriate to implement the Water Management
21 Plan, upon terms equitable to all parties, and consistent with their respective
22 obligations to their own customers.

23
24 9.6.7 Rules and Regulations. The Watermaster may make such
25 rules and regulations as may be necessary for its own operations as well as for the
26 operation of the Plan and this Judgment, subject to Court approval. Meetings of the
27 Watermaster shall be subject to the Brown Act .
28

1 9.6.8 Reports to Court. The Watermaster shall file annually
2 with the Court, and serve on all Parties, a report regarding its activities during the
3 preceding year, including an audited statement of all accounts and financial
4 activities.

5
6 9.6.9 Notice to Parties. Watermaster shall maintain a current
7 list of the Parties and their addresses for notice purposes. Rules for service shall be
8 governed by the California Code of Civil Procedure and the California Rules of
9 Court. Each Party shall notify Watermaster in writing of the name and address for
10 its receipt of notice and service under this Judgment. A Party may change this
11 information by written notice to Watermaster. Notice shall be deemed sufficient if
12 directed to the most recent address provided by the Watermaster.

13
14 9.7 Watermaster Records. Watermaster's records shall be kept at
15 the office of Eastern unless changed by the Watermaster and approved by the
16 Court. These records shall be treated as public records under the Public Records
17 Act. Cal. Gov't Code §§ 6250-6277 (West 1995 and Supp. 2002).

18
19 10. MISCELLANEOUS.

20
21 10.1 Intervention After Judgment. Any Person who is not a Party
22 and who proposes to Produce water from the Management Area, or who is an
23 heir, successor or assign of an existing party, may become a Party to this action
24 and Judgment, subject to the conditions contained herein, by filing a petition in
25 intervention. The petition may be filed and approved ex parte with notice to the
26 Watermaster. Such intervener shall thereafter be a Party bound by this Judgment,
27 and entitled to the rights and privileges accorded under this Judgment.

1 10.2 Loss of Rights. No right adjudicated in this Judgment shall be
2 lost by non-use, abandonment, forfeiture or otherwise, except upon a written
3 election by the owner of the right filed with Watermaster, or by order of the Court
4 upon noticed motion and after hearing.

5
6 10.3 Attorney's Fees and Costs. No Party shall recover any
7 attorney's fees or costs in this proceeding from any Party.

8
9 Dated: _____, 200_

10
11 _____
12 Judge of the Superior Court
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EXHIBIT B

List of Parties to this Judgment

1. Parties

- A. Eastern Municipal Water District ("Eastern")
- B. Lake Hemet Municipal Water District ("Lake Hemet")
- C. City of Hemet ("Hemet")
- D. City of San Jacinto ("San Jacinto")

2. Class A Participants

- A.
- B.
- C.
- D.

3. Class B Participants

- A.
- B.
- C.

Exhibit C

Base Production Rights

1. Public Agencies

Agency Name	Base Production Rights (Acre-feet per year)
Eastern Municipal Water District	10,869
Lake Hemet Municipal Water District	11,063
City of Hemet	6,320
City of San Jacinto	4,031

2. Class B Participants

Eastern Municipal Water District:

Name	Title
David J. Slawson	Board President, Division 5
Ronald Sullivan	Board Vice President, Division 4
Joe Kuebler, CPA	Director Division 2, EMWD Board Treasurer
Philip E. Paule	Director Division 1
Randy A. Record	Director Division 3, MWD Director

Lake Hemet Municipal Water District:

Name	Title
Frank Douglas Marshall III	Board President
Patrick Searl	Board Vice President
Herbert C. Forst	Board Secretary
John S. Fricker	Board Treasurer
Larry Minor	Director

City of Hemet:

Name	Title
Marc Searl	Mayor
Lori Van Arsdale	Vice- Mayor
C. Robin Resser Lowe	Councilperson
Brian Christie	Councilperson
Eric Mc Bride	Councilperson
Steve Clayton	City Clerk
Judith Oltman	City Treasurer

City of San Jacinto:

Name	Title
Jim Ayres	Mayor
Chris Carlson	Vice- Mayor
Dale Stubblefield	Council Member
Robert Ritchie	Council Member
John Mansperger	Council Member

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: _____, 2004.

EASTERN MUNICIPAL WATER
DISTRICT

By: _____

Dated: _____, 2004.

LAKE HEMET MUNICIPAL WATER
DISTRICT

By: _____

Dated: _____, 2004.

CITY OF HEMET

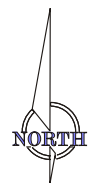
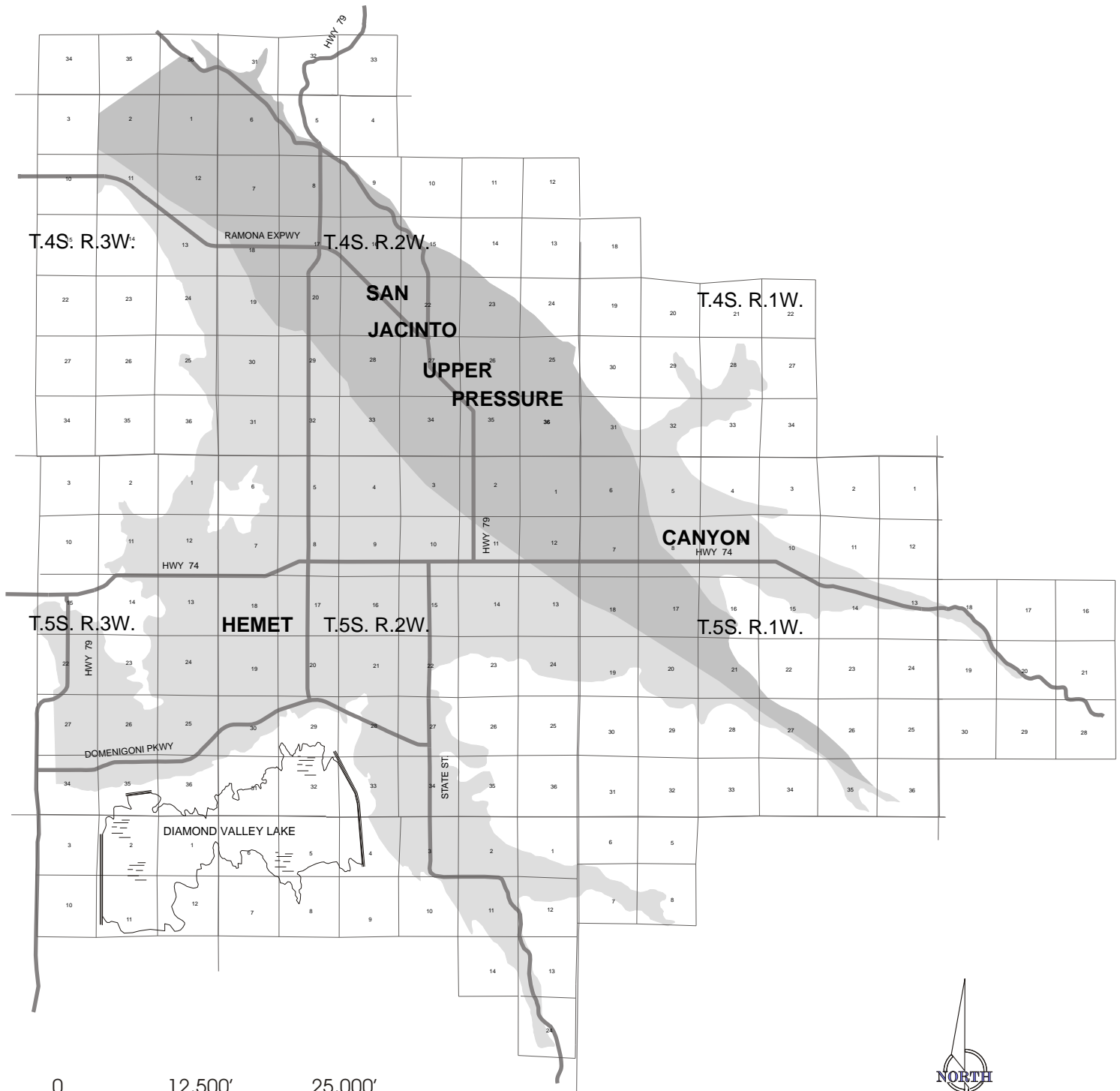
By: _____

Dated: _____, 2004.

CITY OF SAN JACINTO

By: _____

MANAGEMENT AREA



1" = 12,500'
05-29-2003

APPENDIX E

LIST OF COMMITTEE ATTENDEES

Appendix E. List of Committee Attendees

The attendees of the PC who contributed to this plan:

Name	Title	Affiliation
Debi Lara	Administrative Assistant	City of Hemet
Marc Searl	Member, City Council	City of Hemet
Steve Temple	City Manager	City of Hemet
Eric Vail	Attorney	City of Hemet
Lori VanArsdale	Member, City Council	City of Hemet
Dennis Williams	Consultant	City of Hemet
Chris Carlson-Buydos	Member, City Council	City of San Jacinto
Bob Hargreaves	Attorney	City of San Jacinto
Steven Johnson	Consultant	City of San Jacinto
Barry McClellan	City Manager	City of San Jacinto
Ken Shaw	Member, City Council	City of San Jacinto
Samson Haile-Selassie	Project Manager	DWR
Eric Hong	Project Manager	DWR
Dale Schafer	Facilitator	DWR
Ali Taghavi	Consultant	DWR
Mike Garner	Asst. General Manager	EMWD
Richard Hall	Member, BOD	EMWD
Behrooz Mortazavi	Asst. General Manager	EMWD
Tony Pack	General Manager	EMWD
Ravi Ravishanker	Deputy General Manager	EMWD
Gerry Shoaf	Attorney	EMWD
Rodger Siems	Member, BOD	EMWD
Herb Forst	Member, BOD	LHMWD
John Fricker	Member, BOD	LHMWD
Rob Lindquist	General Manager	LHMWD
Art Littleworth	Attorney	LHMWD
John Loncar	Consultant	LHMWD
Tom Wagoner	General Manager	LHMWD
Bruce Scott	Private Water Producer	Private Water Producer
Jim Conner	Private Water Producer	Private Water Producer
Bill Corwin	Private Water Producer	Private Water Producer
Gary McMillan	Private Water Producer	Private Water Producer
Randy Record	Private Water Producer	Private Water Producer
Joe Garcia	Environmental Specialist	Soboba Tribe

Appendix E. List of Committee Attendees

The members of the TC who contributed to this plan:

Name	Title	Affiliation
Mike Gow	Director of Public Works	City of Hemet
Dennis Williams	Consultant	City of Hemet
Steve Johnson	Consultant	City of San Jacinto
Maurice Hall	Project Manager	DWR
Eric Hong	Project Manager	DWR
Dale Schafer	Facilitator	DWR
Ali Taghavi	Consultant	DWR
Khos Ghaderi	Director of Operations	EMWD
Joe Lewis	Director of Engineering Svcs.	EMWD
Fahkri Manghi	Hydrologist	EMWD
Behrooz Mortazavi	Asst. General Manager	EMWD
Peter Odencrans	Public Affairs Officer	EMWD
Ralph Phraner	Senior Geologist	EMWD
Ravi Ravishanker	Deputy General Manager	EMWD
John Loncar	Consultant	LHMWD
Tom Wagoner	General Manager	LHMWD
Dick Kelley	Private Water Producer	Private Water Producer
Bruce Scott	Private Water Producer	Private Water Producers
Joe Garcia	Environmental Specialist	Soboba Tribe
Peter Pyle	Consultant	Soboba Tribe

Appendix E. List of Committee Attendees

The representatives of each Public Agency and DWR at CAM Committee meetings who contributed to this plan:

Name	Title	Affiliation
Steve Temple	City Manager	City of Hemet
Eric Vail	Attorney	City of Hemet
Dennis Williams	Consultant	City of Hemet
Bob Hargreaves	Attorney	City of San Jacinto
Steve Johnson	Consultant	City of San Jacinto
Barry McClellan	City Manager	City of San Jacinto
Samson Haile-Selassie	Project Manager	DWR
Eric Hong	Project Manager	DWR
Dale Schafer	Facilitator	DWR
Ali Taghavi	Consultant	DWR
Mike Garner	Asst. General Manager	EMWD
Behrooz Mortazavi	Asst. General Manager	EMWD
Tony Pack	General Manager	EMWD
Chuck Rathbone	Director of Finance	EMWD
Gerry Shoaf	Attorney	EMWD
Art Littleworth	Attorney	LHMWD
John Loncar	Consultant	LHMWD
Tom Wagoner	General Manager	LHMWD

LHMWD SURFACE WATER DIVERSION

EMWD IMPORTED WATER USAGE

EMWD RECYCLED WATER PRODUCTION

EMWD RECYCLED WATER SALES

EMWD
Historical Water Supply Components (AF)

Year	Groundwater*	Imports	Recycled Water**	Sales to other Agencies	Conveyance Water	Total
1984	11,763	2,228	0	(1,811)	0	12,181
1985	11,859	971	0	(2,301)	0	10,529
1986	11,605	605	0	(1,750)	0	10,460
1987	12,217	2,889	37	(3,549)	0	11,594
1988	14,539	4,463	42	(2,929)	0	16,116
1989	14,762	5,712	40	(4,500)	0	16,014
1990	16,533	5,774	24	(8,417)	0	13,915
1991	12,051	378	24	(2,667)	0	9,786
1992	11,810	92	25	(2,149)	0	9,778
1993	10,483	0	1	(155)	0	10,329
1994	12,253	0	0	(1,823)	0	10,430
1995	11,055	50	7	(707)	0	10,406
1996	16,349	0	57	(1,902)	(2,583)	11,921
1997	16,282	183	31	(1,133)	(3,120)	12,242
1998	14,692	0	4	(417)	(3,656)	10,623
1999	17,458	0	0	(1,658)	(3,130)	12,670
2000	17,634	198	0	(2,236)	(2,690)	12,906
2001	15,127	1,761	0	(2,853)	(907)	13,128
2002	15,370	0	0	(4,895)	(929)	9,546
2003	13,693	325	0	(1,864)	(686)	11,468
2004	12,515	5,636	0	(4,283)	0	13,868

* Groundwater includes conveyance water

** Recycled water does not include water sold to land owners for irrigation

LHMWD
Historical Water Supply Components (AF)

Year	Groundwater	Purchases from EMWD	Surface Water	Total
1984	4,901	1811	*	*
1985	6,609	2074	6,557	15,241
1986	6,961	1750	6,078	14,789
1987	6,929	3396	4,418	14,743
1988	7,427	2792	6,424	16,642
1989	6,481	4338	6,837	17,656
1990	5,829	8382	1,902	16,114
1991	7,559	2300	2,057	11,917
1992	7,770	2149	2,206	12,125
1993	6,748	155	6,064	12,967
1994	9,780	1820	1,633	13,233
1995	9,166	653	4,328	14,146
1996	10,932	1841	3,359	16,132
1997	12,472	507	2,959	15,938
1998	9,356	266	4,019	13,641
1999	13,390	952	3,033	17,375
2000	13,093	1808	1,765	16,666
2001	12,490	2103	1,348	15,941
2002	12,595	4100	441	17,136
2003	12,044	1343	1,530	14,918
2004	11,900	3635	1,330	16,865

* Surface water data unavailable for 1984

**City of Hemet Water Service Area
Historical Water Supply Components (AF)**

Year	Groundwater	Purchases from EMWD	Total
1984	3,514	0	3,514
1985	3,810	227	4,037
1986	5,531	0	5,531
1987	4,669	153	4,822
1988	6,306	137	6,443
1989	6,549	162	6,711
1990	5,776	35	5,811
1991	5,138	367	5,505
1992	5,597	0	5,597
1993	5,478	0	5,478
1994	5,327	3	5,330
1995	5,643	1	5,644
1996	5,961	14	5,975
1997	5,891	27	5,918
1998	4,801	31	4,832
1999	4,805	642	5,447
2000	5,048	428	5,476
2001	4,735	749	5,484
2002	4,955	761	5,716
2003	4,999	518	5,517
2004	5,684	345	6,029

**City of San Jacinto Water Service Area
Historical Water Supply Components (AF)**

Year	Groundwater	Purchases from EMWD	Total
1984	2,805	0	2,805
1985	2,840	0	2,840
1986	2,763	0	2,763
1987	2,746	0	2,746
1988	2,980	0	2,980
1989	2,662	0	2,662
1990	3,841	0	3,841
1991	3,051	0	3,051
1992	3,481	0	3,481
1993	2,802	0	2,802
1994	2,793	0	2,793
1995	2,637	54	2,691
1996	2,831	47	2,878
1997	2,337	600	2,937
1998	2,585	120	2,705
1999	2,766	65	2,831
2000	2,780	0	2,780
2001	2,742	1	2,743
2002	3,231	34	3,265
2003	3,154	2	3,156
2004	2,794	303	3,097

**Private Water Producers
Historical Water Supply Components (AF)**

Year	Groundwater	Recycled Water	Total
1984	27,420	2086	29,506
1985	30,465	4076	34,541
1986	29,317	4480	33,797
1987	28,512	4461	32,973
1988	27,933	5010	32,943
1989	27,390	5571	32,961
1990	24,725	4439	29,164
1991	23,894	3688	27,582
1992	23,904	3076	26,980
1993	26,130	3301	29,431
1994	30,777	2416	33,193
1995	28,777	3847	32,624
1996	27,216	4312	31,528
1997	28,566	4507	33,073
1998	27,630	3926	31,556
1999	29,358	4975	34,333
2000	33,123	4596	37,719
2001	28,678	4319	32,997
2002	19,962	4888	24,850
2003	15,465	3898	19,363
2004	17,179	5047	22,226

Soboba Tribe
Historical Water Supply Components (AF)

Year	Groundwater	Total
1984	398	398
1985	948	948
1986	912	912
1987	450	450
1988	450	450
1989	450	450
1990	450	450
1991	450	450
1992	450	450
1993	450	450
1994	246	246
1995	951	951
1996	1,324	1,324
1997	1,190	1,190
1998	1,000	1,000
1999	1,545	1,545
2000	1,321	1,321
2001	1,536	1,536
2002	2,016	2,016
2003	1,773	1,773
2004	1,315	1,315



STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

License for Diversion and Use of Water

APPLICATION 924

PERMIT 468

LICENSE 10667

THIS IS TO CERTIFY, That **EASTERN MUNICIPAL WATER DISTRICT**
P. O. BOX 858, HENET, CALIFORNIA 92343

HAS *made proof as of* **JANUARY 23, 1969** *(the date of inspection)*
to the satisfaction of the State Water Resources Control Board of a right to the use of the water of
SAN JACINTO RIVER IN RIVERSIDE COUNTY

tributary to **LAKE ELSINORE**

for the purpose of **IRRIGATION AND DOMESTIC USES**
under Permit **468** *of the Board and that the right to the use of this water has been perfected*
in accordance with the laws of California, the Regulations of the Board and the permit terms; that the
priority of this right dates from **FEBRUARY 14, 1918** *and that the amount of water to which*
this right is entitled and hereby confirmed is limited to the amount actually beneficially used for the stated
purposes and shall not exceed **FIVE THOUSAND SEVEN HUNDRED SIXTY (5,760) ACRE-Feet PER ANNUM,**
TO BE COLLECTED TO UNDERGROUND STORAGE BY SPREADING FROM NOVEMBER 1 OF EACH YEAR TO
JUNE 30 OF THE SUCCEEDING YEAR AT A RATE OF 41 CUBIC FEET PER SECOND AND SUBSEQUENTLY
EXTRACTED AND PLACED TO BENEFICIAL USE. SO LONG AS THERE IS NO INTERFERENCE WITH
OTHER RIGHTS, JUNIOR, AS WELL AS SENIOR, LICENSEE MAY INCREASE HIS RATE OF DIVERSION
TO A MAXIMUM OF 100 CUBIC FEET PER SECOND; PROVIDED THAT THE TOTAL QUANTITY DIVERTED
IN ANY 30-DAY PERIOD DOES NOT EXCEED 2,442 ACRE-Feet.

THE POINTS OF DIVERSION OF SUCH WATER ARE LOCATED:

- (1) SOUTH 2,900 FEET AND EAST 1,400 FEET FROM NW CORNER OF SECTION 10, T5S, R1E, SBB&M, BEING WITHIN NE1/4 OF SW1/4 OF SAID SECTION 10, AND**
- (2) NORTH 1,600 FEET AND WEST 900 FEET FROM SW CORNER OF SECTION 4, T5S, R1E, SBB&M, BEING WITHIN NW1/4 OF SW1/4 OF SAID SECTION 4.**

**A DESCRIPTION OF LANDS OR THE PLACE WHERE
SUCH WATER IS PUT TO BENEFICIAL USE IS AS FOLLOWS:**

**DOMESTIC USE AND IRRIGATION OF 7,500 ACRES NET WITHIN A GROSS AREA OF 29,500 ACRES
WITHIN T4S, R1W; T4S, R1E; T5S, R1E; T5S, R1W; T5S, R2W, SBB&M, AS SHOWN ON MAP
FILED WITH STATE WATER RESOURCES CONTROL BOARD.**

**DIVERSION OF WATER UNDER THIS LICENSE IS, AND SHALL BE, SUBJECT TO THE PRO-
VISION OF JUDGMENT AND DECREE ISSUED IN CASE NUMBER 51,546 IN THE SUPERIOR COURT
OF THE STATE OF CALIFORNIA IN AND FOR THE COUNTY OF RIVERSIDE, SAID JUDGMENT AND
DECREE BEING DATED 3 JUNE, 1954.**

Licensee shall allow representatives of the Board and other parties, as may be authorized from time to time by the Board, reasonable access to project works to determine compliance with the terms of this license.

All rights and privileges under this license including method of diversion, method of use and quantity of water diverted are subject to the continuing authority of the Board in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of said water.

Reports shall be filed promptly by licensee on appropriate forms which will be provided for the purpose from time to time by the Board.

The right hereby confirmed to the diversion and use of water is restricted to the point or points of diversion herein specified and to the lands or place of use herein described.

This license is granted and licensee accepts all rights herein confirmed subject to the following provisions of the Water Code:

Section 1625. Each license shall be in such form and contain such terms as may be prescribed by the Board.

Section 1626. All licenses shall be under the terms and conditions of this division (of the Water Code).

Section 1627. A license shall be effective for such time as the water actually appropriated under it is used for a useful and beneficial purpose in conformity with this division (of the Water Code) but no longer.

Section 1628. Every license shall include the enumeration of conditions therein which in substance shall include all of the provisions of this article and the statement that any appropriator of water to whom a license is issued takes the license subject to the conditions therein expressed.

Section 1629. Every licensee, if he accepts a license does so under the conditions precedent that no value whatsoever in excess of the actual amount paid to the State therefor shall at any time be assigned to or claimed for any license granted or issued under the provisions of this division (of the Water Code), or for any rights granted or acquired under the provisions of this division (of the Water Code), in respect to the regulation by any competent public authority of the services or the price of the services to be rendered by any licensee or by the holder of any rights granted or acquired under the provisions of this division (of the Water Code) or in respect to any valuation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State, of the rights and property of any licensee, or the possessor of any rights granted, issued, or acquired under the provisions of this division (of the Water Code).

Section 1630. At any time after the expiration of twenty years after the granting of a license, the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State shall have the right to purchase the works and property occupied and used under the license and the works built or constructed for the enjoyment of the rights granted under the license.

Section 1631. In the event that the State, or any city, city and county, municipal water district, irrigation district, lighting district, or political subdivision of the State so desiring to purchase and the owner of the works and property cannot agree upon the purchase price, the price shall be determined in such manner as is now or may hereafter be provided by law for determining the value of property taken in eminent domain proceedings.

Dated: MAY 25 1976

STATE WATER RESOURCES CONTROL BOARD

Division	DISTRIBUTION	Code
	Deputy Secretary	
	General Manager	
	Deputy General Manager	
	Administrative Services	
	Community Relations	
	Contract Administration	
	Purchasing	
	Engineering Branch	
	Planning	
	Maps & Records	
	Engineering	
	Construction	
	Operations Branch	
	Water Reservoirs & Sewer	
	Water Operations & M. & E.	
	Water Utility	
	Administration Branch	
	Customer Service	
	Water Billing	
	Public Information	
	Finance	
	General Services	

R. J. Rosenberger
Chief, Division of Water Rights

W/enuL.

APPENDIX H1: PREPARATION OF WATER MANAGEMENT PLAN

***APPENDIX H2: DRAFT AGREEMENT REGARDING PHASE 1 FACILITIES
CONSTRUCTION COST AND USE***

APPENDIX H3: MONITORING PROGRAM

APPENDIX H4: INTERIM WATER SUPPLY PLAN

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 by 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.

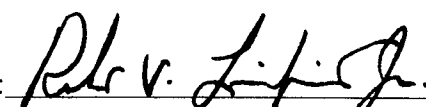
4.6 **Effective Date.** This MOU has become effective among and between the Parties on the date by which each Party's governing board or council has approved the MOU and the authorized representative of each Party has executed the MOU.

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: Julio 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. Chauinard
~~City of San Jacinto~~
City Clerk

Approved as to Form:

By: Robert H. Hargrave
~~Robert H. Hargrave~~ Robert H. Hargrave
City Attorney

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.

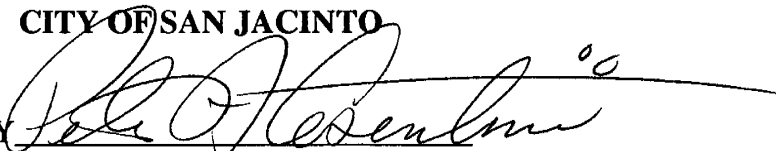
CITY OF HEMET

DATE 9/13/03

BY 
City Manager

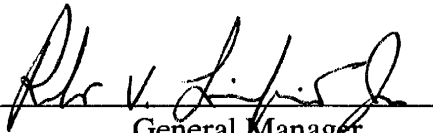
CITY OF SAN JACINTO

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

***AGREEMENT TO IMPLEMENT THE 2005 WATERSHED
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 Policy and Technical Committees was formed in June of 2001 to identify programs needed to improve groundwater resources management in the area.
6. The AGENCIES developed and implemented a groundwater monitoring program for the year 2004 for the accurate evaluation of groundwater changes within the Hemet/San Jacinto Management area.
7. The AGENCIES are interested in the continuation of the groundwater monitoring program for the accurate evaluation of water resources in the Hemet/San Jacinto Management area.
8. The AGENCIES are interested in overseeing the current USGS surface water monitoring program for better evaluation of the recharge into the Hemet/San Jacinto Management area.
9. The AGENCIES have determined that implementation of a watershed monitoring program which consists of groundwater and surface water monitoring is necessary for the accurate evaluation of the safe yield of the Hemet/San Jacinto Management area.

B – The Purpose of this Agreement:

1. Conduct a Watershed Monitoring Program which consists of groundwater and surface water monitoring in the Hemet/San Jacinto Management area for year 2005.
2. Appoint Eastern Municipal Water District as the Monitoring Program Administrator.
3. Establish an equitable funding mechanism to collect the corresponding shares of each entity to fund the Monitoring Program for 2005.

II. COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals and mutual covenants contained herein, the AGENCIES hereby agree as follows:

A Watershed Monitoring Program:

The AGENCIES and other private groundwater producers in the area hereby will implement a Watershed Monitoring Program during 2005.

B Roles and Responsibilities of the AGENCIES:

The AGENCIES shall continue the duties as performed during implementation of the Groundwater Monitoring Program in 2004 and oversee the surface water monitoring conducted by U.S. Department of Interior - Geological Survey (USGS).

C Monitoring Program Costs:

A total of \$112,000 is estimated to be required for the operation of the watershed monitoring program during 2005. This amount includes participation in a cooperative surface water monitoring program with USGS in addition to the groundwater monitoring program conducted during 2004. Contingencies and uncertainties associated with such monitoring programs are also included in this amount.

D Cost Sharing of the Monitoring Program:

Until the full implementation of the Water Management Plan, the AGENCIES will share the Watershed Monitoring Program costs based on their base groundwater production percentages that are subject to assessments as determined by the Hemet/San Jacinto Policy Committee and shown below:

Cost Sharing For 2005				
Agency	Base Production (AF)	Production subject to Assessment	Percentage	Cost Contribution
City of Hemet	6,320	5,420	17.8%	\$ 19,900
City of San Jacinto	4,031	3,131	10.3%	\$ 11,500
LHMWD.	11,063	11,063	36.3%	\$ 40,700
EMWD	10,869	10,869	35.7%	\$ 39,900

Totals	32,283	30,483	100.0%	\$ 112,000
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If the above costs increase by more than 10%, the AGENCIES shall meet and confer on the cost allocation amendment.

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.

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 1/24/05

BY 
City Manager

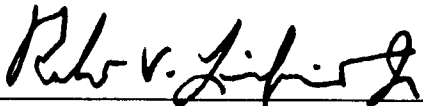
CITY OF SAN JACINTO

DATE 1-12-05

BY  00
City Manager


**LAKE HEMET MUNICIPAL
WATER DISTRICT**

DATE JAN. 12, 2004

BY 
General Manager

EASTERN MUNICIPAL WATER DISTRICT

DATE Jan 19, 2005

BY 
General Manager

MEMORANDUM OF UNDERSTANDING

2006-2008 WATERSHED MONITORING PROGRAM

HEMET/SAN JACINTO MANAGEMENT AREA

This Memorandum Of Understanding; 2006-2008 Watershed Monitoring Program, Hemet/San Jacinto Management Area ("MOU"), is hereby dated for reference purposes as of May 23, 2006, 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 previously entered into an "Agreement to Implement the 2004 Watershed Monitoring Program in the Hemet/San Jacinto Management Area" dated September 19, 2003 ("2004 MOU") and an "Agreement to Implement the 2005 Watershed Monitoring Program in the Hemet/San Jacinto Management Area" dated January 26, 2005 ("2005 MOU"). The purpose and rationale of the Watershed Monitoring Program ("WMP") as reflected in the 2004 MOU and 2005 MOU is to conduct a program which consists of groundwater and surface water monitoring in the Hemet/San Jacinto Management Area ("Management Area") for years 2004 and 2005.

B. The Parties agree that the groundwater in the Management Area has been, and will remain, a significant source of water for the people and agribusiness of Riverside County, thus providing an invaluable contribution to the local economy and public good, for which the Parties strive to increase the availability and reliability of local surface and groundwater resources in the area.

C. The Parties have an interest in the management of local water resources within the Management Area. To this end, the California 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.

D. Through cooperation, open communication, and consensus building among the Parties, the Hemet/San Jacinto Policy and Technical Committees were formed in June of 2001, to identify programs needed to improve groundwater resources management in the area. Through these committees, the Parties developed and implemented the 2004 MOU and 2005 MOU for the accurate evaluation of groundwater changes within the Management Area. The parties desire to continue the WMP for the accurate evaluation of water resources within the Management Area.

E. The Parties further desire to oversee the current U.S. Department of Interior - Geological Survey ("USGS") Surface Water Monitoring Program for a better evaluation of the

recharge into the Management Area. Accordingly, the Parties have determined that implementation of a WMP which consists of groundwater and surface water monitoring is necessary for the accurate evaluation of the safe yield of the Management Area.

F. In furtherance thereof, it is the purpose and intent of the Parties in entering into this MOU to continue the WMP consisting of groundwater and surface water monitoring in the Management Area for years 2006 through 2008, appoint Eastern Municipal Water District as the WMP Administrator, and establish an equitable funding mechanism to collect the corresponding shares of each entity to fund the WMP for 2006 through 2008. To implement this goal, the Parties pledge to undertake the following actions.

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:

1.0 THE PARTIES' PLEDGES AND CONDITIONS

1.1 **Pledges by the Parties**. Subject to the conditions set forth in Section 1.2, the Parties pledge the following:

1.1.1 **Implementation of the WMP**. The Parties agree to implement, and other local private groundwater producers have separately agreed to implement outside of this MOU, a WMP for the years 2006 through 2008, and agree to continue the duties as performed during implementation of the 2004 MOU and 2005 MOU to oversee the surface water monitoring conducted by U.S. Department of Interior - Geological Survey (USGS).

1.1.2 **Appointment of EMWD as WMP Administrator**. The Parties agree that EMWD shall be appointed as the WMP Administrator, whose duties shall include the administration of the WMP and the invoicing of the other Parties as provided below.

1.1.3 **WMP Costs**. An annual cost of \$112,000 is estimated to be required for the operation of the WMP for each of the three years from 2006 through 2008. This amount includes participation in a cooperative Surface Water Monitoring Program with USGS in addition to the WMP conducted during 2004 and 2005. Contingencies and uncertainties associated with such monitoring programs are also included in this amount. If the above cost increases by more than 10%, the Parties agree to meet and confer on the cost allocation amendment.

1.1.4 **Cost Sharing of the WMP**. Until the full implementation of the Water Management Plan, the Parties agree to share the WMP costs based on their base groundwater production percentages that are subject to assessments as determined by the Hemet/San Jacinto Policy Committee and shown in the table below:

Cost Sharing For 2006 through 2008				
Agency	Base Production (AF)	Production subject to Assessment	Percentage	Cost Contribution
Hemet	6,320	5,420	17.8%	\$ 19,900
San Jacinto	4,031	3,131	10.3%	\$ 11,500
LHMWD	11,063	11,063	36.3%	\$ 40,700
EMWD	10,869	10,869	35.7%	\$ 39,900
Totals	32,283	30,483	100.0%	\$ 112,000

1.2 **Cooperation with Other Parties.** The Parties agree to cooperate with each other 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.

2.0 MISCELLANEOUS PROVISIONS

2.1 **Term and Continuation of the WMP.** This MOU shall terminate, unless extended by the mutual agreement of the Parties memorialized in writing, on the earlier of the following dates: (i) the date upon which two or more Parties mutually agree to terminate the MOU; (ii) the date upon which all Parties have adopted the Water Management Plan; or (iii) December 31, 2008. During the Term of this MOU, all of the obligations of the Parties shall be continued and carried over to the next calendar year, subject to adjustment if the WMP cost increases by more than 10%. The Parties shall meet and confer during the last quarter of the preceding year to determine the anticipated cost to be apportioned among the Parties for the forthcoming year and memorialized in a statement signed by the managers of all Parties. In any year subsequent to 2006, no Party shall be obligated to contribute more than one hundred twenty-five percent (125%) of its contribution assigned for the prior year without approval of its Board or Council

2.2 **Invoicing.** The Parties agree that EMWD shall invoice each Party for its contribution to the WMP and subsequent years, either in one lump sum during the year, or in installments over the year as is agreed upon by the Party being invoiced and arranged by that Party with EMWD.

2.3 **Ownership of Documents.** The Parties agree that all data and reports produced shall become the joint property of the Parties.

2.4 **Costs & Expenses.** Other than as set forth above, the Parties shall bear their own costs and expenses of otherwise participating in this MOU.

2.5 **Authority.** The individuals executing this MOU 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.


2.6 **Counterpart Originals.** This Agreement may be executed in duplicate originals, each of which is deemed to be an original.

2.7 **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.

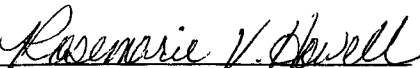
[SIGNATURE ON FOLLOWING PAGES]

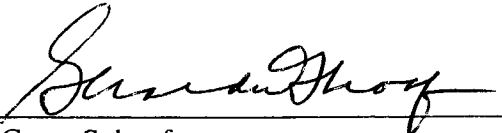
EASTERN MUNICIPAL WATER DISTRICT

By: 
Tony Pack
General Manager

ATTEST:

Approved as to Form:

By: 
Board Secretary

By: 
Gerry Schoaf
General Counsel

LAKE HEMET MUNICIPAL WATER DISTRICT

By: Tom Wagoner
Tom Wagoner, General Manager

ATTEST:

Approved as to Form:

By: John Chubb
District, Secretary

By: Arthur L. Littleworth
Arthur Littleworth, General Counsel


CITY OF HEMET


By: 

Steve Temple, City Manager

ATTEST:

Approved as to Form:

By: 
Stephen Clayton, City Clerk

By: 
Eric S. Vail, City Attorney

CITY OF SAN JACINTO

By: Barry McClellan
Barry McClellan, City Manager

ATTEST:

Approved as to Form:

By: Dorothy Chomnard
Dorothy Chomnard, City Clerk

By: Robert Hargreaves
Robert Hargreaves, Special Counsel

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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 Meniffee 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 Meniffee 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 Meniffee 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

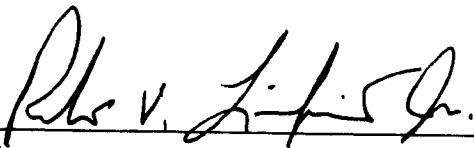
By:




Its:

GENERAL MANAGER

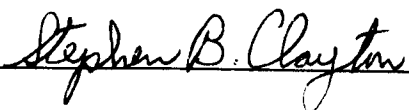
LAKE HEMET MUNICIPAL WATER
DISTRICT

By: 
Its: GENERAL MANAGER


CITY OF HEMET

By: 
Steve Temple, City Manager

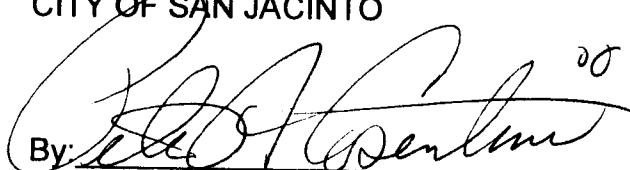
ATTEST:

By: 
Stephen Clayton
City Clerk

Approved as to Form:

By: 
Eric S. Vail
Assistant City Attorney for the City
of Hemet

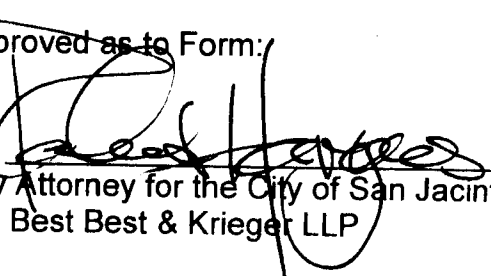
CITY OF SAN JACINTO

By:  28
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

2005 INTERIM WATER SUPPLY PLAN

UPPER SAN JACINTO SUB-BASINS

This Memorandum Of Understanding; 2005 Interim Water Supply Plan, Upper San Jacinto Sub-Basins ("MOU"), is hereby entered into this 1ST day of March, 2005 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 previously entered into that "Memorandum of Understanding Interim Water Supply Plan Upper San Jacinto Sub-Basins" dated April 1, 2004 ("2004 MOU") to purchase supplemental water for recharge into certain portions of the canyon and intake sub-areas of the San Jacinto Basin ("Upper San Jacinto Sub-Basins"). The purpose and rationale of the Interim Water Supply Plan ("IWSP") is more fully recited in the 2004 MOU and is incorporated herein by reference.

B. The Parties have determined that it is in the best interest of each of them to continue the IWSP through calendar year 2005 on the terms and conditions set forth in this MOU. The Parties have also affirmed that continuation of the IWSP in this manner is consistent with their effort to engage in collective approaches to addressing the overdraft while the Parties work toward completion of the Water Management Plan.

C. In furtherance thereof, it is the purpose and intent of the Parties in entering into this MOU to assist in providing for interim stabilization of the Upper San Jacinto Sub-Basins through the application of approximately 8,000 acre feet of direct and indirect groundwater recharge during the calendar year 2005. To implement this goal, the Parties pledge to undertake the following actions during the calendar year 2005.

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 One Million One Hundred Fifty-eight Thousand Two Hundred Dollars and No Cents (\$1,158,200.00) for the acquisition, transportation, operation, 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 2005, and will eliminate the use of any conveyance water during the 2005 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 2005 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 2005, 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 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, 3.1, and 4.1.

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 Nine Hundred Eighty-seven Thousand Six Hundred Dollars and No Cents (\$987,600.00) for the acquisition, transportation, operation, 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 2005, 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 2005 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 2005, and to eliminate the use of any conveyance water during the 2005 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 2005 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 2005, 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, 3.1, and 4.1.

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 Pledges by Hemet. Subject to the conditions set forth in Section 3.2, Hemet pledges the following:

3.1.1 Purchase and Recharge of Water. Hemet will contribute up to One Hundred Sixty-four Thousand Dollars and No Cents (\$164,000.00) for the acquisition, transportation, operation, and recharge of imported water into the Upper San Jacinto Sub-Basins. Hemet will coordinate and cooperate with EMWD and MWD regarding the acquisition of imported water. Hemet 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.

3.1.2 Optimizing Capacity. Hemet will cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2005, 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 Hemet may have to purchase and receive Fruitvale Water.

3.2 Hemet's Conditions. The pledges of Hemet stated in Section 3.1 are subject to the following conditions:

3.2.1 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.

3.2.2 Preservation of Fruitvale Water Rights. Notwithstanding Hemet's pledge to not exercise its entitlements to purchase and receive Fruitvale Water during calendar year 2005, 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.

3.2.3 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 2005 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 2005 calendar year.

3.2.4 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, 2.1, and 4.1.

3.3 Acceptance of Other Parties' Conditions. Hemet hereby accepts each other Party's conditions on their respective pledges.

3.4 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 Pledges by San Jacinto. Subject to the conditions set forth in Section 4.3, San Jacinto pledges the following:

4.1.1 Purchase and Recharge of Water. San Jacinto will contribute up to Ninety Thousand Two Hundred Dollars and No Cents (\$90,200.00) for the acquisition, transportation, operation, and recharge of imported water into the Upper San Jacinto Sub-Basins. San Jacinto will coordinate and cooperate with EMWD and MWD regarding the acquisition of imported water. San Jacinto 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.

4.1.2 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 2005, 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.

4.2 San Jacinto's Conditions. San Jacinto's pledges as stated in Section 4.2 are subject to the following conditions:

4.2.1 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 San Jacinto, San Jacinto reserves the right to exercise its rights to delivery of Fruitvale Water during the months of July, August and September 2005 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.

4.2.2 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 2005, 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.

4.2.3 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 2005 calendar year.

4.2.4 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, 2.1, and 3.1.

4.3 Acceptance of Other Parties' Conditions. San Jacinto hereby accepts each other Party's conditions on their respective pledges.

4.4 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, 2005.

5.2 **Invoicing.** The Parties agree that EMWD shall invoice each Party for its contribution to the 2005 IWSP either in one lump sum during the Term, or in installments over the Term as is agreed upon by the Party being invoiced and arranged by that Party with EMWD.

5.3 **Costs & Expenses.** The Parties shall bear the costs of implementing their own pledges, and shall bear their own costs and expenses of otherwise participating in this MOU.

5.4 **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.

5.5 **Counterpart Originals.** This Agreement may be executed in duplicate originals, each of which is deemed to be an original.

5.6 **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.

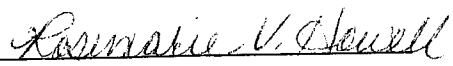
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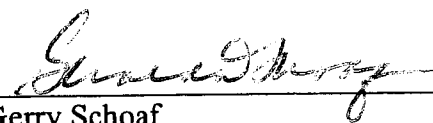
EASTERN MUNICIPAL WATER DISTRICT

By: 
Tony Pack
General Manager

ATTEST:

Approved as to Form:

By: 
Board Secretary

By: 
Gerry Schoaf
General Counsel

LAKE HEMET MUNICIPAL WATER DISTRICT

By: Rob Lindquist
Rob Lindquist, General Manager


ATTEST:

Approved as to Form:

By: Karen Hornbarger
Karen Hornbarger, Secretary
Assistant Secretary

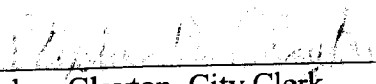
By: Arthur L. Littleworth
Arthur Littleworth, General Counsel

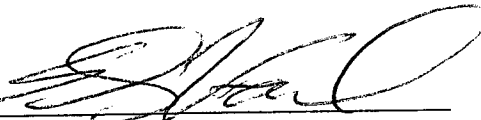
CITY OF HEMET

By: 
Steve Temple, City Manager

ATTEST:

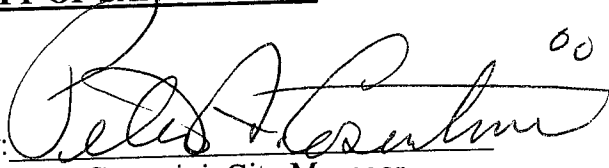
Approved as to Form:

By: 
Stephen Clayton, City Clerk

By: 
Eric S. Vail, City Attorney

CITY OF SAN JACINTO

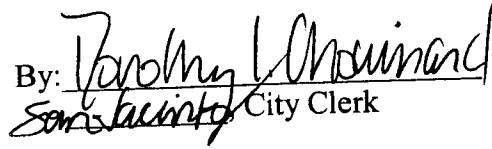
By:



Peter Cosentini, City Manager

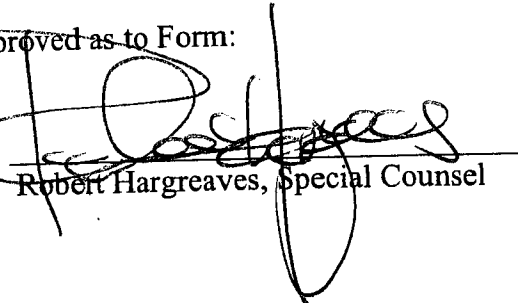
ATTEST:

By:


Dorothy L. Chouinard
San Jacinto City Clerk

Approved as to Form:

By:



Robert Hargreaves, Special Counsel

MEMORANDUM OF UNDERSTANDING

2006 INTERIM WATER SUPPLY PLAN

UPPER SAN JACINTO SUB-BASINS

This Memorandum Of Understanding; 2006 Interim Water Supply Plan, Upper San Jacinto Sub-Basins ("MOU"), is hereby dated for reference purposes as of April 8, 2006, 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 previously entered into that "Memorandum of Understanding, Interim Water Supply Plan, Upper San Jacinto Sub-Basins" dated April 1, 2004 ("2004 MOU") and that "Memorandum of Understanding, 2005 Interim Water Supply Plan, Upper San Jacinto Sub-Basins" dated March 1, 2005 ("2005 MOU"). The purpose and rationale of the Interim Water Supply Plan ("IWSP") as reflected in the 2004 MOU and 2005 MOU is to purchase supplemental water for recharge into certain portions of the canyon and intake sub-areas of the San Jacinto Basin ("Upper San Jacinto Sub-Basins").

B. The IWSP was undertaken by the parties as an interim measure pending completion and adoption of a Water Management Plan and entry of a Stipulated Judgment (collectively "WMP") by a Court of competent jurisdiction, binding the Parties to a long term solution to managing and resolving the overdraft of the Hemet / San Jacinto Basin ("Management Area"). Although the Parties have been working earnestly toward completion of the WMP, it is anticipated that the WMP will not be finalized and adopted by all Parties sufficiently early in 2006 so as to supersede the need for the IWSP.

C. Based on this state of affairs, the Parties have determined that it is in their mutual best interests to continue the IWSP through calendar year 2006 and/or until such time as the WMP is finalized and adopted by all of the Parties. The Parties have also affirmed that continuation of the IWSP in this manner is consistent with their effort to engage in collective approaches to addressing the overdraft while the Parties work toward completion of the WMP.

D. In furtherance thereof, it is the purpose and intent of the Parties in entering into this MOU to assist in providing for 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 the calendar year 2006 and an equivalent or greater amount of water, adequate supply providing, in subsequent years. To implement this goal, the Parties pledge to undertake the following actions.

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.** During the Term of this MOU, EMWD agrees to contribute funds, in the amounts provided for in this MOU, for the acquisition, transportation, operation, 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. For calendar 2006, EMWD agrees to contribute up to Six Hundred Seventy-Five Thousand Seven Hundred Dollars and No Cents (\$675,700.00) for imported water under the MOU.

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 2006, and will eliminate the use of any conveyance water during the 2006 calendar year in the Meniffee 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 2006 calendar year. In addition, EMWD will investigate water supply contingency plans.

1.1.3 **Continued Participation in IWSP.** Subject to Section 5.1 EMWD agrees that it will continue its participation in the Interim Water Supply Plan in the same manner and to the same extent as set forth in Article 1.0 of the MOU during each subsequent calendar year until the WMP has been finalized and adopted by all parties.

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 2006, 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 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, 3.1, and 4.1.

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. During the Term of this MOU, LHMWD agrees to contribute funds, in the amounts provided for in this MOU, for the acquisition, transportation, operation, 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. For calendar 2006, LHMWD agrees to contribute up to Eight Hundred Forty-Two Thousand Four Hundred Dollars and No Cents (\$842,400.00) for imported water under the MOU.

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 2006, 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.

2.1.3 Continued Participation in IWSP. Subject to Section 5.1, LHMWD agrees that it will continue its participation in the Interim Water Supply Plan in the same manner and to the same extent as set forth in Article 2.0 of the MOU during each subsequent calendar year until the WMP has been finalized and adopted by all parties.

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 2006 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 2006, and to eliminate the use of any conveyance water during the 2005 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 2006 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 2006, 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, 3.1, and 4.1.

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 Pledges by Hemet. Subject to the conditions set forth in Section 3.2, Hemet pledges the following:

3.1.1 Purchase and Recharge of Water. During the Term of this MOU, Hemet agrees to contribute funds, in the amounts provided for in this MOU, for the acquisition, transportation, operation, and recharge of imported water into the Upper San Jacinto Sub-Basins. Hemet will coordinate and cooperate with EMWD and MWD regarding the acquisition of imported water. Hemet 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. For calendar 2006, Hemet agrees to contribute up to One Hundred Ninety-Four Thousand Dollars and No Cents (\$194,000.00) for imported water under the MOU.

3.1.2 Optimizing Capacity. Hemet will cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2006, 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 Hemet may have to purchase and receive Fruitvale Water.

3.1.3 Continued Participation in IWSP. Subject to Section 5.1, Hemet agrees that it will continue its participation in the Interim Water Supply Plan in the same manner and to the same extent as set forth in Article 3.0 of the MOU during each subsequent calendar year until the WMP has been finalized and adopted by all parties.

3.2 Hemet's Conditions. The pledges of Hemet stated in Section 3.1 are subject to the following conditions:

3.2.1 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 Department, Hemet shall be entitled to increase water production from any one or more of Hemet's wells located within the Upper San Jacinto Sub-Basins, or receive Fruitvale Water during the duration of the emergency for which Hemet shall pay EMWD the standard rate for Fruitvale Water, for amounts delivered within Hemet's entitlement. For amounts required by Hemet and delivered by EMWD over the entitlement amount, Hemet shall pay EMWD's then current wholesale water rates.

3.2.2 Preservation of Fruitvale Water Rights. Notwithstanding Hemet's pledge to not exercise its entitlements to purchase and receive Fruitvale Water during calendar year 2006, 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.

3.2.3 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 2006 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 2006 calendar year.

3.2.4 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, 2.1, and 4.1.

3.3 **Acceptance of Other Parties' Conditions.** Hemet hereby accepts each other Party's conditions on their respective pledges.

3.4 **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 **Pledges by San Jacinto.** Subject to the conditions set forth in Section 4.3, San Jacinto pledges the following:

4.1.1 **Purchase and Recharge of Water.** During the Term of this MOU, San Jacinto agrees to contribute funds, in the amounts provided for in this MOU, for the acquisition, transportation, operation, and recharge of imported water into the Upper San Jacinto Sub-Basins. San Jacinto will coordinate and cooperate with EMWD and MWD regarding the acquisition of imported water. San Jacinto 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. For calendar 2006, San Jacinto agrees to contribute up to Eighty-Seven Thousand Nine Hundred Dollars and No Cents (\$87,900.00) for imported water under the MOU.

4.1.2 **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 2006, 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.

4.1.3 **Continued Participation in IWSP.** Subject to Section 5.1, San Jacinto agrees that it will continue its participation in the Interim Water Supply Plan in the same manner and to the same extent as set forth in Article 4.0 of the MOU during each subsequent calendar year until the WMP has been finalized and adopted by all parties.

4.2 **San Jacinto's Conditions.** San Jacinto's pledges as stated in Section 4.1 are subject to the following conditions:

4.2.1 **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 San Jacinto, San Jacinto reserves the right to exercise its rights to delivery of Fruitvale Water during the months of July, August and September 2006 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.

4.2.2 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 2006, 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.

4.2.3 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 2006 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 2006 calendar year.

4.2.4 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, 2.1, and 3.1.

4.3 Acceptance of Other Parties' Conditions. San Jacinto hereby accepts each other Party's conditions on their respective pledges.

4.4 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 and Continuation of the IWSP. This MOU shall terminate, unless extended by the mutual agreement of the Parties memorialized in writing, on the earlier of the following dates: (i) the date upon which two or more Parties mutually agree to terminate the MOU; (ii) the date upon which all Parties have adopted the WMP; or (ii) December 31, 2008. During the Term of this MOU, all of the obligations of the Parties shall be continued and carried over to the next calendar year, subject to adjustment for the amount of water to be recharged in any subsequent year. The Parties acknowledge that the amount of water to be recharged may fluctuate year to year depending upon conditions within the Management Area, the availability of Imported Water, and the ability to receive and recharge such water. The Parties agree that the goal is to purchase and recharge between 6,000 to 8,000 acre feet of Imported Water each year during the Term. The Parties shall meet and confer during the last quarter of the preceding year to determine the amount of water and the anticipated cost to be apportioned among the Parties for the forthcoming year and memorialized in a statement signed by the managers of all Parties. In any year subsequent to 2006, no Party shall be obligated to contribute more than one hundred

twenty-five percent (125%) of its contribution assigned for the prior year without approval of its Board or Council.

5.2 **Invoicing.** The Parties agree that EMWD shall invoice each Party for its contribution to the 2006 IWSP and subsequent years, either in one lump sum during the year, or in installments over the year as is agreed upon by the Party being invoiced and arranged by that Party with EMWD.

5.3 **Costs & Expenses.** The Parties shall bear the costs of implementing their own pledges, and shall bear their own costs and expenses of otherwise participating in this MOU.

5.4 **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.


5.5 **Counterpart Originals.** This Agreement may be executed in duplicate originals, each of which is deemed to be an original

5.6 **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.

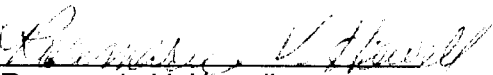
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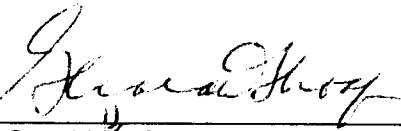
EASTERN MUNICIPAL WATER DISTRICT

By: 
Anthony J. Pack
General Manager

ATTEST:

Approved as to Form:

By: 
Rosemarie V. Howell
Board Secretary

By: 
Gerald R. Shoaf
General Counsel

LAKE HEMET MUNICIPAL WATER DISTRICT

By: Thomas W. Wagoner
Tom Wagoner, General Manager

ATTEST:

Approved as to Form:

By: Karen Hornbarger
Assistant Secretary
Karen Hornbarger

By: Arthur L. Littleworth
Arthur Littleworth, General Counsel

CITY OF SAN JACINTO

By: Barry McClellan
Barry McClellan, City Manager


ATTEST:

Approved as to Form:

By: Dorothy Chouinard
Dorothy Chouinard, City Clerk


By: Robert Hargreaves
Robert Hargreaves, Special Counsel


CITY OF HEMET

By: 
Steve Temple, City Manager

ATTEST:

Approved as to Form:

By: 
Stephen Clayton, City Clerk

By: 
Eric S. Vail, City Attorney

APPENDIX I

**SB1938 GROUNDWATER MANAGEMENT
PLAN COMPLIANCE CHECKLIST**

Water Management Plan GWMP Components

Description	Section(s)
<i>SB 1938 Mandatory Components</i>	
1. Documentation of public involvement	2.2.4, 11.10
2. BMO(s)	3.1
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality	3.1.7, 3.2.7, 11.2
4. Plan to involve other agencies located in the groundwater basin	2
5. Adoption of monitoring protocols	11.2
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with agencies boundaries that are subject to GWMP	2.2, 4.1
7. For agencies not overlying groundwater basins, prepare the GWMP using appropriate geologic and hydrogeologic principles	N/A
<i>AB 3030 and SB 1938 Voluntary Components</i>	
1. Control of saline water intrusion	3.2.3
2. Identify and manage well protection and recharge areas	3.2, 11.2
3. Regulate the migration of contaminated groundwater	3.2
4. Administer well-abandonment and destruction program	11.2, 11.9
5. Control and mitigate groundwater overdraft	3.2, 5.3
6. Replenish groundwater	3.2, 5.3
7. Monitor groundwater levels	3.2, 11.2
8. Develop and operate conjunctive use projects	3.2, 5.3
9. Identify well-construction policies	11.9
10. Develop and operate groundwater contamination cleanup, recharge, storage, conservation, water-recycling, and extraction projects	3.2, 5.3
11. Develop relationships with state and federal regulatory agencies	1.1, 3.2, 4.10
12. Review land use plans and coordinate with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	5.1
<i>DWR Bulletin 118 Suggested Components</i>	
1. Manage with guidance of advisory committee	2.4, 9
2. Describe area to be managed under GWMP	2.1
3. Create links between BMOs and goals and actions of GWMP	3, 11.6
4. Describe GWMP monitoring programs	3.2, 11.2
5. Describe integrated water-management planning efforts	3.2, 4.8.3, 5.3.3.1, 5.3.3.6

Description	Section(s)
6. Report of implementation of GWMP	11.2, 11.5
7. Evaluate GWMP periodically	11.5, 9.6.2

Appendix G - Stipulated Judgment

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SUPERIOR COURT OF CALIFORNIA
COUNTY OF RIVERSIDE
APR 18 2013
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EASTERN MUNICIPAL WATER DISTRICT

SUPERIOR COURT OF THE STATE OF CALIFORNIA
IN AND FOR THE COUNTY OF RIVERSIDE

EASTERN MUNICIPAL WATER DISTRICT,)	CASE NO.:
A California Municipal Water District,)	
)	STIPULATED JUDGMENT
)	
Plaintiff,)	
vs.)	
)	
CITY OF HEMET;)	
CITY OF SAN JACINTO;)	
LAKE HEMET MUNICIPAL WATER)	
DISTRICT;)	
DOES 1 through 1,000, inclusive,)	
)	
Defendants.)	
)	

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1 **FINDINGS**

2
3 After consideration of the pleadings and the Stipulation for Entry of Judgment, the Court
4 finds that:

5 1. **Complaint.** On May 16, 2012, Plaintiff Eastern Municipal Water District
6 ("Eastern") filed a Complaint against Defendants Lake Hemet Municipal Water District ("Lake
7 Hemet"), City of Hemet ("Hemet"), City of San Jacinto ("San Jacinto"), and DOES 1 through
8 1,000, inclusive. The Complaint requests a declaration of Plaintiff's and Defendants' individual
9 and collective rights to Surface Water and Groundwater in the Canyon Subbasin, the San Jacinto
10 Upper Pressure Subbasin downstream to Bridge Street, and the Hemet Basin ("Management
11 Area") and the imposition of a Physical Solution to achieve the optimum, reasonable, beneficial
12 use of the waters of the Management Area pursuant to section 2 of article X of the California
13 Constitution. A map describing the boundaries of the Management Area is attached to this
14 Judgment as Exhibit "A" and to the Complaint.

15 2. **Parties.**

16 A. **Eastern.** Eastern is a California municipal water district formed pursuant
17 to the Municipal Water District Law, California Water Code Sections 71000-73001 (West 1966),
18 with its principal place of business in Riverside County, California. Eastern diverts Surface
19 Water from the San Jacinto River, and pumps Groundwater from the Management Area for use
20 by its customers within its boundaries.

21 B. **Lake Hemet.** Lake Hemet is a California municipal water district formed
22 pursuant to the Municipal Water District Law, California Water Code Sections 71000-73001
23 (West 1966), with its principal place of business in Riverside County, California. Lake Hemet
24 diverts Surface Water from the Santa Jacinto River and its tributaries, and pumps Groundwater
25 from the Management Area for use by its customers within its boundaries.

26 C. **Hemet.** Hemet is a California municipal corporation providing utility
27 services pursuant to the California Constitution, article XI, section 9. Hemet pumps
28 Groundwater from the Management Area for use by its customers within its boundaries.

1 **D. San Jacinto.** San Jacinto is a California municipal corporation providing
2 utility services pursuant to the California Constitution, article XI, section 9. San Jacinto pumps
3 Groundwater from the Management Area for use by its customers within its boundaries.

4 **E. Pumpers.** Does 1 through 1,000, inclusive, are Persons or entities who
5 own farms or other property within the Management Area, and pump Groundwater from the
6 Management Area.

7 **3. Answers and Stipulation for Judgment.** All defendants have filed Answers,
8 and all Parties have filed a Stipulation for Entry of Judgment.

9 **4. Sole Producers.** Other than the Soboba Band of Luiseño Indians, and certain
10 overlying users not Parties to this litigation, the Parties claim essentially all of the rights to
11 produce Surface Water and Groundwater in the Management Area.

12 **5. Importance of Surface Water and Groundwater.** Surface water and
13 Groundwater from the Management Area are important water supplies for agriculture, domestic
14 and municipal use. The Parties have a mutual and collective interest in the coordinated
15 management of such water resources to ensure that the common resource is used efficiently and
16 reasonably, and that it is sustained and replenished.

17 **6. Overdraft.** It is estimated that the Overdraft of the Management Area is
18 approximately 10,000 acre-feet per year. This estimate will be refined through further studies to
19 be completed pursuant to the Water Management Plan, including data on the several subbasins
20 within the Management Area. Studies confirm that in recent years the total Groundwater
21 production from the Management Area, including pumping by those Persons not Parties to this
22 litigation, has averaged approximately 54,800 acre-feet per year.

23 **7. Importance of Judgment.** The Parties have an interest in the Physical Solution
24 imposed by this Judgment to promote the efficient and coordinated management of Surface
25 Water and Groundwater, to avoid problems from Overdraft, to assist in protecting the rights of
26 the Soboba Band of Luiseño Indians, to sustain and enhance water resources, and to resolve
27 competing claims to Surface Water and Groundwater.

28 **8. Jurisdiction.** This Court has jurisdiction to enter this Judgment declaring and

1 adjudicating the rights of the Parties to the reasonable and beneficial use of Surface Water and
2 Groundwater in the Management Area, and to impose a Physical Solution pursuant to law,
3 including California Constitution, article X, section 2.

4
5 **JUDGMENT**

6
7 **IT IS ORDERED, ADJUDGED AND DECREED:**

8 **1. DEFINITIONS.**

9 **1.1 Adjusted Production Right** – the Base Production Right of each Public
10 Agency, as adjusted pursuant to Sections 3.2 to 3.2.5.

11 **1.2 Administrative Assessment** – an acre-foot charge to be levied against
12 each Public Agency for water pumped up to its Adjusted Production Right, including any unused
13 amount of such Right that is pumped in a following year (Carry-Over Credit). Such assessments
14 shall be used for Administrative Expenses, and for the purchase of Supplemental Water after
15 Administrative Expenses have been paid. No Administrative Assessment shall be levied on a
16 Party's pumping of its share of Imported, Supplemental, or Stored Water.

17 **1.3 Administrative Expenses** – Include, but are not limited to,
18 Watermaster's expenses for office rental, personnel, supplies, office equipment, general
19 overhead, preparing and collecting assessments, monitoring well pumping, measuring water
20 levels, sampling and analyzing water quality, compiling and interpreting collected data,
21 conducting special studies, litigation, and such other expenses as are reasonable and necessary
22 for the Watermaster to carry out its duties under the Physical Solution and Water Management
23 Plan.

24 **1.4 Advisor.** An independent engineering firm or qualified individual as
25 provided in Section 9.6.3.

26 **1.5 Annual Basin Yield** – the quantity of Groundwater that Watermaster
27 determines the Parties may Produce from the Management Area in a calendar year without a
28 replenishment obligation under the Physical Solution.

1 **1.6 Base Production Right** – a water right of a Public Agency or Class B
2 Participant.

3 **1.7 Carry-Over Credit** – a Public Agency’s or a Class B Participant’s credit
4 against the Replenishment Assessment in a Fiscal Year, based on the Agency’s Adjusted or Base
5 Production Right or share of Imported Water not produced in prior calendar years.

6 **1.8 Class A Participant** – a Private Pumper who stipulates to this Judgment
7 and participates in the Water Management Plan as defined in Sections 4.3 to 4.3.5.

8 **1.9 Class B Participant** – a Private Pumper who stipulates to this Judgment
9 and participates in the Water Management Plan as defined in Sections 4.4 to 4.4.6.

10 **1.10 Fiscal Year** – the period from July 1 through June 30 of the following
11 calendar year.

12 **1.11 Fruitvale Documents** –

13 **(a) Fruitvale Judgment** – The Judgment and Decree entered in the
14 Superior Court for the County of Riverside on June 4, 1954, in an action titled The City of San
15 Jacinto, et al. v. Fruitvale Mutual Water Company, et al., Case No. 51-546;

16 **(b) Fruitvale Mutual Water Company Sale of Assets to Eastern** –
17 That certain “Agreement for the Sale of Assets of the Fruitvale Mutual Water Company to
18 Eastern Municipal Water District” dated September 10, 1971 (“Purchase Agreement”);

19 **(c) Fruitvale Mutual Water Company Agency Agreements** – The
20 Agreement Between the City of San Jacinto and Eastern Municipal Water District dated
21 November 2, 1971, the Agreement Between Lake Hemet Municipal Water District and Eastern
22 Municipal Water District dated June 9, 1972, and the Agreement Between the City of Hemet and
23 Eastern Municipal Water District dated June 13, 1972, all providing for recognition of ownership
24 of stock in Fruitvale Mutual Water Company by the Cities and by Lake Hemet, and making
25 provision for the continued sale of water produced through the Fruitvale facilities by Eastern to
26 the Cities and to Lake Hemet.

27 **1.12 Groundwater** – all water within and beneath the ground surface of the
28 Management Area.

1 **1.13 Groundwater Degradation** (also “groundwater quality degradation” and
2 “water quality degradation,” “Degradation” and “Degraded Groundwater”) – Water
3 contamination as defined in state and/or federal law, and other conditions of reduced water
4 quality as determined by the Watermaster to be harmful or undesirable for the operation of the
5 Management Area.

6 **1.14 Imported Water** – An average of 7,500 acre feet annually of water sold
7 by The Metropolitan Water District of Southern California to Eastern pursuant to Section 4.4 of
8 the Soboba Band of Luiseño Indians “Settlement Agreement.”

9 **1.15 In-Lieu Water** – Groundwater that is not pumped, but which would have
10 otherwise been pumped by the holder of an Overlying or Appropriative Right within the
11 Management Area, by virtue of the pumper’s agreement with an Agency or the Watermaster to
12 receive and use Recycled Water or other nonpotable water in lieu of Groundwater.

13 **1.16 Management Area** –the Canyon, the San Jacinto Upper Pressure, and the
14 Hemet North and Hemet South Basins, as delineated on the map attached as Exhibit “A.”

15 **1.17 Metropolitan** – The Metropolitan Water District of Southern California.

16 **1.18 Natural Recharge** – Groundwater replenishment within the Management
17 Area occurring from precipitation on the surface, percolation from surface flows of the San
18 Jacinto River and its tributaries, spreading or injection of such surface flows, return flows from
19 irrigation, and subsurface inflows.

20 **1.19 New Pumper** – a Private Pumper who pumps for the first time after entry
21 of Judgment herein.

22 **1.20 Non-Participant** – a Private Pumper who elects not to participate in the
23 Management Plan, or to be a Party to this Judgment.

24 **1.21 Overdraft** – a condition whereby pumping in the Management Area
25 exceeds the Safe Yield thereof.

26 **1.22 Overlying Right** – the appurtenant right of an owner of land overlying the
27 Management Area to pump water from such land for beneficial use thereon.
28

1 **1.23 Party or Parties** – Eastern, Lake Hemet, Hemet, San Jacinto and the other
2 Persons listed in the attached Exhibit “B.”

3 **1.24 Person** – any individual, partnership, association, corporation, trust,
4 government agency or other organization.

5 **1.25 Physical Solution** – the Court decreed method of managing the water
6 supply of the Management Area to maximize the reasonable and beneficial use of the waters
7 thereof pursuant to the California Constitution, article X, section 2, to eliminate Overdraft
8 pursuant to the provisions of this Judgment, to protect the prior rights of the Soboba Tribe, and to
9 provide for the substantial enjoyment of all water rights recognizing their priorities.

10 **1.26 Private Pumper** – a Person who owns land with an Overlying Right or
11 other right in the Management Area and pumps more than 25 acre-feet per year. Private Pumper
12 includes New Pumps.

13 **1.27 Public Agency or Agencies** – Eastern, Lake Hemet, Hemet and San
14 Jacinto.

15 **1.28 Recharge or Replenish** – to sink, spread or inject water directly or
16 indirectly underground in the Management Area.

17 **1.29 Recharge Right** – the rights of Eastern and Lake Hemet to pump and use
18 water previously replenished to the Management Area as provided in Section 6.7.4.

19 **1.30 Recycled Water** – treated wastewater which is processed and suitable for
20 controlled use in the Management Area, including Recharge.

21 **1.31 Replenishment Assessment** – a charge to be levied against each Public
22 Agency for each acre foot, or portion thereof, of Groundwater pumped in excess of the sum of its
23 respective Adjusted Production Right, its share of Imported Water, Stored Water, Supplemental
24 Water, and applicable Carry-Over Credits and Recharge Rights; and against each Class B
25 Participant for pumping in excess of its 1995-99 average production, i.e., its Base Production
26 Right. The rate of such assessments shall be determined by the Watermaster and shall be used
27 for Replenishment Expenses.
28

1 **1.32 Replenishment Expenses** – Watermaster expenses, including, but not
2 limited to, the acquisition of Supplemental Water supplies, development of In-Lieu Water
3 projects, acquisition or improvement of land, and for the construction, maintenance and
4 operation of facilities necessary to replenish Groundwater in the Management Area, or otherwise
5 to provide water to Parties within the Management Area.

6 **1.33 Safe Yield** – the long term, average quantity of water supply in the
7 Management Area that can be pumped without causing undesirable results, including the gradual
8 reduction of natural Groundwater in storage over long-term hydrologic cycles. The initial Safe
9 Yield of the Management Area is estimated to be approximately 45,000 acre feet per year.

10 **1.34 Settlement Agreement** – that Agreement titled “The Soboba Band of
11 Luiseño Indians Settlement Agreement” among the Soboba Tribe, the United States, as Trustee
12 for the Tribe, Eastern Municipal Water District, Lake Hemet Municipal Water District, and The
13 Metropolitan Water District of Southern California.

14 **1.35 Soboba Tribe (sometimes the “Tribe”)** – the Soboba Band of Luiseño
15 Indians.

16 **1.36 Soboba Action** – the lawsuit entitled Soboba Band of Mission Indians,
17 etc., v. Metropolitan, etc., et al, U.S. District Court, Central District of California, Case No.
18 00-84208 GAF (MANx).

19 **1.37 Storage Agreement** – an agreement between Watermaster and a Party to
20 store Supplemental Water (other than a Party’s share of Imported Water) by sinking, spreading,
21 injecting or in-lieu procedures in the Management Area, and to establish a manner of accounting
22 for the credit therefore and subsequently to recover such water, without payment of
23 Administrative or Replenishment Assessments.

24 **1.38 Storage Right** – a Party's right to store and pump Supplemental Water
25 (not required for a Party’s share of Imported Water) pursuant to a Storage Agreement.

26 **1.39 Stored Water** – Supplemental Water (other than a Party’s share of
27 Imported Water) stored by a Party pursuant to a Storage Agreement.
28

1 **1.40 Supplemental Water** – nontributary water imported into the Management
2 Area, including imported water (i.e., other than or in addition to Imported Water as defined in
3 Section 1.14), Recycled Water, In-Lieu Water, and other nonpotable water.

4 **1.41 Surface Water** – all water tributary to the Management Area and flowing
5 above the ground surface.

6 **1.42 Transfer** – a temporary or permanent authorized conveyance, assignment,
7 sale, contract or lease of part or all of a Public Agency’s Carry-Over Credit, Storage Right or
8 Recharge Right to any other Party, or a temporary assignment, contract, lease or sale of a Public
9 Agency’s share of Imported Water.

10 **1.43 Tribal Water Rights** – the Soboba Tribe’s rights to water set forth in
11 Section 4.1 of the Settlement Agreement and Section 5 of this Stipulated Judgment.

12 **1.44 Tunnel** – the San Jacinto Tunnel in Riverside County, California,
13 constructed by Metropolitan in the 1930s.

14 **1.45 Watermaster** – the Board with the powers and duties defined in Section
15 9.

16 **1.46 Water Management Plan** (sometimes the “Plan”) – the Plan adopted by
17 the Watermaster, as it may be modified from time to time, to implement the Physical Solution, to
18 ensure an adequate and reliable source of future water supply for the Management Area, and to
19 protect the prior rights of the Soboba Tribe.

20 **2. EXHIBITS.**

21 The following exhibits are attached to this Judgment and incorporated in it:

22 “A.” Map of the Management Area and the Management Area Watershed.

23 “B.” List of Parties to this Judgment.

24 “C.” Description of each Public Agency’s and Class A and Class B Participant’s
25 Base Production Right.

1 **3. PUBLIC AGENCIES' WATER RIGHTS.**

2 **3.1 Base Production Right.** The Public Agencies are owners of rights to
3 pump Groundwater from the Management Area as set forth in Exhibit "C." These rights are for
4 a calendar year and were calculated as follows:

5 **3.1.1 Eastern.** The Base Production Right of Eastern is based upon its
6 respective average pumping for calendar years 1995-1999, less an adjustment of 1800 acre-feet
7 representing a portion of a credit which it receives from Metropolitan for seepage into
8 Metropolitan's San Jacinto Tunnel, for Eastern's use of Fruitvale water elsewhere, and for use of
9 Fruitvale water by Lake Hemet, San Jacinto, and Hemet. The 1995-1999 period was chosen to
10 reflect recent production prior to the commencement of negotiations leading to this Stipulated
11 Judgment.

12 **3.1.2 Lake Hemet.** The Base Production Right of Lake Hemet is based
13 on its average production for calendar years 1995-1999.

14 **3.1.3 Hemet.** The Base Production Right of Hemet is based on its
15 average production for calendar years 1995-99, plus an adjustment of 900 acre feet per year
16 representing a portion of the seepage credit referenced in Section 3.1.1.

17 **3.1.4 San Jacinto.** The Base Production Right of San Jacinto is based
18 upon its average Production for calendar years 1995-1999, plus 500 acre-feet per year, and plus
19 an adjustment of 900 acre feet per year representing a portion of the seepage credit referenced in
20 Section 3.1.1. The 500 acre-feet per year has been added because San Jacinto's recent pumping
21 does not reflect its historic production, due to water purchases and other factors.

22 **3.1.5 Adjustments.** The Base Production Rights of Hemet and San
23 Jacinto each include 900 acre-feet per year that have been added to their respective amounts of
24 pumping for calendar years 1995-1999. These amounts have been added to provide Hemet and
25 San Jacinto a fair share of water from, and to resolve disputes regarding, Eastern's use of tunnel
26 seepage, Eastern's use of Fruitvale waters, and Lake Hemet's surface stream diversions. These
27 additional amounts of 900 acre-feet per year shall be treated as the first amounts pumped by
28 Hemet and San Jacinto, shall not be subject to reduction by the Watermaster as provided in

1 Sections 3.2 to 3.2.2, and shall not be subject to any Administrative or Replenishment
2 Assessments as provided in Sections 3.4 to 3.4.2, or to any other fee or charge imposed under the
3 Management Plan.

4 **3.2 Adjusted Production Rights.** It is the goal of the Physical Solution to
5 adjust the Base Production Rights of the Public Agencies over time on a pro-rata basis to a level
6 consistent with the Watermaster's determination of Safe Yield. The reduction will be based on
7 periodic demand, hydrology, Recharge, and the community's ability to pay for Supplemental
8 Water, and protection of the Tribal Water Rights. In order to implement this reduction in a
9 phased manner, each Public Agency's Base Production Right shall be subject to adjustment as
10 follows:

11 3.2.1 Subject to Section 3.1.5, a 10% reduction from each Base
12 Production Right in the first full year after entry of this Judgment.

13 3.2.2 Until Adjusted Production Rights are consistent with the Public
14 Agencies' share of Safe Yield, Watermaster shall determine the required reductions in Adjusted
15 Production Rights in each subsequent year to achieve Safe Yield within a reasonable period of
16 time as determined by the Watermaster, considering the extent of the Overdraft, the economic
17 impact on the Parties bound by this Judgment, and other relevant factors. The goal is to achieve
18 Safe Yield over a six (6) year period assuming an annual Overdraft of 10,000 acre feet. In the
19 event the extent of the Overdraft is greater or lesser than assumed, then the period of time
20 reasonably required to reach Safe Yield may be extended or reduced accordingly. However, in
21 no event shall any reduction be more than 10% of the Adjusted Production Rights of the prior
22 year.

23 3.2.3 A Public Agency Party may pump in excess of its Adjusted
24 Production Right, without any additional Administrative or Replenishment Assessment, by an
25 amount equal to its share of the 7,500 acre feet per year of Imported Water that is not used by the
26 Tribe provided such water has been previously delivered and is stored or will be delivered during
27 the current water year. The amount of the Tribe's unused portion of the 7,500 acre feet shall be
28 determined annually by the Watermaster. Shares of unused Imported Water shall be allotted to

1 the Public Agency Parties in proportion to Base Production Rights, and shall be acquired and
2 paid for pursuant to contract with Eastern.

3 3.2.4 A Base Production Right of a Public Agency serving the land of a
4 Class B Participant shall be increased in an amount equal to such Participant's Base Production
5 Right, adjusted and reduced pursuant to Sections 3.2.1 and 3.2.2, when the Participant's land is
6 converted from agricultural use to water service from the Public Agency, pursuant to Section
7 4.4.3.

8 3.2.5 The Adjusted Production Rights of the Public Agencies may be
9 increased by the Watermaster on a prorata basis to the extent that pumping by Class A
10 participants, or pumping by Persons not Parties to this Judgment, may decrease, and the
11 Watermaster finds that achieving the goal of maintaining the Management Area in a Safe Yield
12 condition can still be met.

13 3.3 **Allocation of Unused Imported Water.** A Public Agency's share of
14 Imported Water that is not used by the Soboba Tribe, as described in Section 3.2.3 shall be
15 subject to the following additional rules:

16 3.3.1 To the extent that a Public Agency does not use all of its share of
17 the Imported Water, the unused portion may be stored for its account for future use or transfer by
18 the Public Agency.

19 3.3.2 A Public Agency may lease, sell or otherwise transfer any portion
20 of the Public Agency's stored Imported Water or of the then current year's share of the Imported
21 Water to another Public Agency or to the Watermaster.

22 3.4 **Public Agency Production Assessments.** Public Agency pumping shall
23 be subject to the following assessments:

24 3.4.1 An Administrative Assessment as provided in Section 1.2. The
25 Administrative Assessment will be \$50.00 per acre-foot of a Party's Adjusted Production Right
26 pumped after entry of this Judgment. The Watermaster shall set the Administrative Assessment
27 rate annually thereafter. The first 900 acre feet per year of Adjusted Production Right pumped
28

1 by Hemet and San Jacinto and water pumped by a Public Agency pursuant to Section 3.4 above
2 shall not be subject to such assessment.

3 3.4.2 A Replenishment Assessment will be levied on each Public
4 Agency as provided in Section 1.31. However, a Public Agency may pump Groundwater in
5 excess of the sum of its Adjusted Production Right, its share of Imported Water, Supplemental
6 Water applicable Carry-Over Credits per Section 6.9.2, Recharge Rights, and production of
7 Stored Water, in order to meet increasing demands, provided that such excess extractions shall
8 be subject to Replenishment Assessments.

9 3.5 **Surface Rights.** Eastern holds License Number 016667 from the State
10 Water Resources Control Board to divert, spread and recover surface flows of the San Jacinto
11 River within the Management Area. Lake Hemet holds pre-1914 appropriative rights to divert
12 and store surface flows in Lake Hemet, and to divert surface flows tributary to but outside of the
13 Management Area from Strawberry Creek and from the North and South Forks of the San
14 Jacinto River. All Parties acknowledge such Eastern and Lake Hemet rights, and the fact that
15 they are not subject to any assessments under this Judgment; provided that any water pumped by
16 Eastern under its License shall be included in its Adjusted Production Right.

17 3.6 **Fruitvale Judgment, Sale of Assets, and Agreements.** The Court
18 hereby finds that Eastern purchased all of the water rights and assets of the Fruitvale Mutual
19 Water Company ("Fruitvale") pursuant to the Agreement described in Section 1.11(b) hereof,
20 and is now the owner thereof. Eastern, as the successor in interest to Fruitvale, is also a
21 defendant in the action described in Section 1.11(a) hereof. The Court finds that the only other
22 remaining Party in such action is the plaintiff City of San Jacinto. The Court retained continuing
23 jurisdiction in such action, and Eastern has made annual reports pursuant to the Fruitvale
24 Judgment. Pursuant to stipulation between Eastern and San Jacinto, and in accord with the
25 Physical Solution and terms of this Judgment, the Court hereby finds that the rights and
26 obligations of the Fruitvale Judgment have been subsumed in, and superseded by, this Judgment
27 and are no longer enforceable; that the limitations upon the place and amounts of water use in the
28 Fruitvale Judgment, the Purchase Agreement (including the provisions regarding domestic water

1 rates within the Fruitvale Improvement District) and the Agency Agreements, all described in
2 Sections 1.11(a), (b) and (c) are no longer applicable or enforceable; and that the continuing
3 jurisdiction of the Court under the Fruitvale Judgment and the obligations of Eastern to report
4 thereunder, are hereby terminated; provided, however, that any service area agreements or
5 agreements related to mutual aid or system interties between any of the Public Agency Parties
6 are not affected by this Judgment.

7 **3.7 Fruitvale Agency Rights.** The water rights of Hemet, San Jacinto and
8 Lake Hemet under the several agreements with Eastern described in Section 1.11(c) hereof have
9 been incorporated in their respective Base Production Rights under this Judgment.

10 **4. PRIVATE PUMPERS' WATER RIGHTS**

11 **4.1 Recognition of Rights.** The Private Pumpers are owners of Overlying or
12 other water rights to pump from the Management Area. The Public Agencies recognize these
13 rights, and do not intend to take or adversely impact these rights without an agreement with the
14 owner of such rights. There is no intent to affect water use that is consistent with the historical
15 use of the Private Pumpers.

16 **4.2 Non-Participation.** A Private Pumper can elect not to participate in the
17 Water Management Plan and not to formally acknowledge its existence. Such Pumpers are
18 referred to as Non-Participants. Non-Participants shall continue to exercise whatever water
19 rights they may hold under California law unaffected by the Plan. However, the Parties do not
20 waive their rights to challenge any new or expanded use of water or water rights. Non-
21 Participants will not have the option of intervening as a Party under the Judgment at a later date.

22 **4.3 Class A Participation.** A Private Pumper can become a Party to the
23 Judgment as a Class A Participant under the following terms:

24 **4.3.1** A Class A Participant who or which approves this Physical
25 Solution may vote for and/or be elected to serve as the Private Pumper representative on the
26 Watermaster, but other than as set forth in Sections 4.3.4 and 4.3.5, shall not otherwise have any
27 obligation for the implementation of the Physical Solution or the Water Management Plan.
28

1 4.3.2 A Class A Participant may, without any assessment by the
2 Watermaster, pump from the Participant's property within the Management Area the amount of
3 water that can be put to reasonable and beneficial use in the Participant's historic place of use or
4 as authorized under California law.

5 4.3.3 Unless the Watermaster determines otherwise, a Class A
6 Participant shall have the right to convert to Class B Participation during a grace period that shall
7 end 3 years after the entry of this Judgment and upon payment of the total assessments, without
8 interest, that the Class A Participant would have paid had the Class A Participant elected to be a
9 Class B Participant from the later of the initial production of Groundwater or the entry of the
10 Judgment herein. Conversely, the converting Participant will be given Carry-Over Credits to
11 which the Participant would have been entitled as a Class B Participant during said period
12 pursuant to Section 6.9.2 below; said Carry-Over Credits may be used to offset any
13 replenishment assessments, including any that would become due following the conversion.

14 4.3.4 A Class A Participant hereby authorizes the installation of water
15 meters, and the collection and reading of Groundwater production, level and water quality data
16 from the Class A Participant's well(s) by personnel authorized by the Watermaster. The
17 metering, meter reading, and other related monitoring efforts shall be at no cost to the Class A
18 Participant, and the Class A Participant shall receive copies of the reports and information
19 obtained upon request.

20 4.3.5 A Class A Participant shall describe or otherwise identify the
21 Participant's land and wells within the Management Area. The heirs, successors and assigns of
22 such land and wells shall succeed to the benefits of the Participant's rights under the Judgment,
23 and be bound by the obligations thereof, provided that such successor intervenes as a Party under
24 the Judgment. Absent such intervention, the successor will be treated as a Non-Participant.

25 **4.4 Class B Participation.** A Private Pumper can become a Class B
26 Participant on the following terms:

27 4.4.1 A Class B Participant's Base Production Right shall be equal to the
28 Participant's average annual production during the calendar years 1995 through 1999, less any

1 amount of water that had been used on land that was developed for non-agricultural purposes
2 after 1999, subject to adjustments by the Watermaster pursuant to Section 4.4.1.1. Any In-Lieu
3 Water used during said period in place of Groundwater production shall be treated as part of the
4 Groundwater production for calculating Base Production Rights. The Class B Participant shall
5 pay Replenishment Assessments on amounts in excess of its Base Production Right, subject to
6 any Carry-Over Credit adjustments pursuant to Section 6.9.2, but shall not be subject to
7 Administrative Assessments, and until transfer to a Public Agency, such Base Production Right
8 shall not be subject to reduction to Safe Yield. In the absence of production history for the entire
9 period (1995-99), the Watermaster, using all available information including power consumption
10 records and records of water use by similar farming operations in the area, will estimate the
11 average annual production for the Participant.

12 4.4.1.1 In the event that the land of a Class B Participant or of a
13 Class A Participant that requests conversion to Class B Participation did not go into full
14 production during the period 1995-1999, or in the absence of a sufficient production history or
15 record, the Watermaster will determine the Base Production Rights to be assigned to such
16 Participant, using all information available to it.

17 4.4.1.2 Upon written request by a Class B Participant, the
18 Watermaster shall have the authority to adjust the Class B Participant's Base Production Rights
19 for such period, and on such terms and conditions, as the Watermaster deems appropriate under
20 the circumstances. For example, but not by way of limitation, the Watermaster could increase
21 the Participant's Base Production Rights on a temporary basis to permit increased Groundwater
22 production during dry periods, or for frost protection, with or without a requirement that such
23 increased production be offset or "repaid" by a decrease in Groundwater production during
24 subsequent wet periods, or to account for added acreage or for a change in crops or use of the
25 land or for a change in ownership. Where new trees were planted during the period 1995-1999,
26 the Watermaster may calculate the Base Production Rights based on known or estimated water
27 use at maturity of such trees.

1 4.4.2 The Class B Participant approves this Physical Solution and may
2 vote for and/or be elected to serve as the Private Pumper's representative on the Watermaster.

3 4.4.3 Upon conversion of a Class B Participant's land from agricultural
4 to a use that requires water service from a Public Agency, the Public Agency shall credit, to the
5 extent legally permissible, the Class B Participant's Base Production Right, adjusted pursuant to
6 the percentage reductions in Sections 3.2.1 and 3.2.2, against any requirement then in effect for
7 any water supply assessment requirements, against any fees associated with water supply that the
8 Public Agency may then have in effect. The Public Agency serving the converted land shall
9 receive a credit added to its Base Production Right as set forth in Section 3.2.4.

10 4.4.4 Upon the sale of property to which or for which Base Production
11 Rights have been assigned by reason of the judgment herein, the Class B Participant may transfer
12 said rights to the purchaser on condition that the purchaser agrees in writing to be bound by the
13 terms of the judgment as a Class B Participant.

14 4.4.5 The Class B Participant hereby authorizes the installation of meters
15 and the collection and reading of Groundwater production, water level and water quality data
16 from the Class B Participant's well(s) by personnel authorized by the Watermaster. The
17 metering, meter reading and other related monitoring efforts shall be at no cost to the Class B
18 Participant, and the Class B Participant shall receive copies of the reports and information
19 obtained upon request.

20 4.4.6 A Class B Participant shall describe or otherwise identify the
21 Participant's land and wells within the Management Area. The heirs, successors and assigns of
22 such land and wells shall succeed to the benefits of the Participant's rights under the Judgment,
23 and be bound by the obligations thereof, provided that such successor intervenes as a Party under
24 the Judgment. Absent such intervention, the successor will be treated as a Non-Participant. A
25 Class B Participant may transfer Base Production Rights to new or replacement land on terms
26 and conditions established by the Watermaster.

27 **4.5 In-Lieu Water Use.** In the event any Private Pumper receives
28 Supplemental Water from a Public Agency to serve an historic use in place of Groundwater, or

1 otherwise engages in an in-lieu program after entry of the Judgment herein, the Overlying Right
2 of the Private Pumper shall not be diminished by the receipt and use of such Supplemental Water
3 or by engaging in an in-lieu program. In the event a Class B Participant received In-Lieu Water
4 for use in place of Groundwater during the period 1995-99, for purposes of determining Base
5 Production Rights, said use shall be considered as Groundwater use.

6 **4.6 Future Production Participation.** Any New Pumper after the entry of
7 this Judgment may intervene in this action and Judgment only as a Class A Participant and may
8 not thereafter convert to Class B status.

9 **4.7 Replacement Wells.** Re-drilling of existing wells and the drilling of new
10 wells to replace existing wells will not be considered new production as provided in Section 4.6.

11 **5. TRIBAL WATER RIGHTS**

12 The Tribal Water Rights have been determined as part of a settlement among the
13 Soboba Tribe, the United States, Eastern, Lake Hemet and Metropolitan. The settlement is
14 reflected in a Settlement Agreement, Congressional legislation and appropriation of funds, and a
15 Judgment in the Soboba Action. Such settlement includes the following provisions, which shall
16 be effective only upon fulfillment of all of the conditions precedent set forth in Article 3 of the
17 Settlement Agreement, a copy of which is attached hereto.

18 **5.1 Senior Right.** The Soboba Tribe shall have a prior and paramount right,
19 superior to all others, to pump 9000 acre-feet per year (3000 acre feet from the Canyon Subbasin
20 and the remainder from a portion of the San Jacinto Upper Pressure Subbasin referred to as the
21 Intake Subbasin), for use on the Reservation, as defined in Article 2.20 of the Settlement
22 Agreement, and on lands now owned or hereafter acquired by the Soboba Tribe contiguous to the
23 Reservation or within the Canyon and Intake Subbasins; provided, however, that such use shall
24 be limited to amounts set forth in a development schedule from 2,900 acre feet per year to 4,100
25 acre-feet per year for the first 50 years after the Effective Date as set forth in Exhibit "I" to the
26 Settlement Agreement. The Tribe's right to pump applies to all Groundwater, whether
27 replenished by Natural Recharge or by Supplemental Water. In addition, the Tribe shall have the
28 right to purchase additional water from the Watermaster during the fifty years that its use is

1 limited according to Exhibit "T" to the Settlement Agreement at the rate then being charged to the
2 Public Agencies under the Water Management Plan. In the event the Soboba Tribe is unable,
3 except for mechanical failure of its wells, pumps or water facilities, to produce from its existing
4 wells or equivalent replacements up to 3,000 AFA production from the Canyon Subbasin and the
5 remainder of its Tribal Water Rights from the Intake Subbasin, Eastern and Lake Hemet shall
6 deliver any shortage to the Soboba Tribe as provided in Section 4.1C of the Settlement
7 Agreement. Pumping for such purpose shall not be subject to Administrative or Replenishment
8 Assessments, and shall not be counted as part of Adjusted Production Rights.

9 **5.2 Metropolitan Water.** The Soboba settlement provides, among other
10 matters, that Metropolitan will use its best efforts to deliver sufficient Imported Water to yield
11 7,500 acre-feet per year, based upon 15 year averages, for Recharge in the Management Area at
12 its untreated replenishment water rate, or any successor rate of equivalent price as provided in
13 Section 4.4A of the Settlement Agreement.

14 **5.3 Settlement Payment.** Subject to the Effective Date of the Settlement
15 Agreement and funding by the United States, Eastern pursuant to the terms set forth in the Water
16 Management Plan, will pay the Soboba Tribe \$17 million dollars pursuant to Article 4.7A of the
17 Settlement Agreement in consideration, in part, of the Tribe's agreement to limit its water use
18 according to Exhibit "T" to the Settlement Agreement for the first 50 years after the Effective
19 Date. Subject to contracts with Eastern, the Public Agencies shall have the right to pump and
20 use all Imported Water not used by the Tribe, and the unused portion of the Tribal Water Rights
21 shall be available for use by the Parties, pursuant to their rights herein.

22 **5.4 Capital Facilities.** Eastern on behalf of the Water Management Plan
23 participants will receive \$10 million from the United States, to be applied to the costs of
24 constructing and operating the Phase I capital facilities necessary to import and Recharge
25 Supplemental Water as described in the Plan.

26 **5.5 Public Agencies' Use of Facilities.** Additional grant funds from the State
27 of California or the United States may also be available for such capital facilities. The rights of
28

1 the Public Agencies to the use of such facilities will be affirmed by contract as set forth in
2 Sections 9.6.4(1) and 9.6.4(3).

3 **5.6 Acknowledgement of Soboba Tribe Settlement.** The Parties to this
4 Judgment hereby recognize the Tribal Water Rights, as set forth above, and the applicable
5 provisions of the Soboba Tribe Settlement Agreement, and acknowledge that protection of Tribal
6 Water Rights is one of the goals of the Water Management Plan.

7 **6. PHYSICAL SOLUTION.**

8 **6.1 Purpose and Objective.** Pursuant to California water law and the
9 California Constitution, article X, section 2, the Court adopts this Physical Solution to maximize
10 reasonable beneficial use of Surface Water, Groundwater and Supplemental Water for water
11 users in or dependent upon the Management Area, to eliminate Overdraft, to protect the prior
12 rights of the Soboba Tribe, and to provide the Parties with the substantial enjoyment of their
13 respective rights, including, the priorities thereof.

14 **6.2 Need for Flexibility.** In order to adapt to potential changes in hydrology,
15 land use, and social and economic conditions, the Physical Solution must provide some degree of
16 flexibility and adaptability. Accordingly, the Court retains broad jurisdiction to supplement the
17 discretion granted to the Watermaster herein.

18 **6.3 Rights to Groundwater.** Groundwater in the Management Area may
19 occur from: Natural Recharge; spreading operations of natural flows; Recharge with
20 Supplemental Water acquired with assessment funds; return flows, fallowing or in-lieu recharge
21 programs financed with assessment funds. All such Groundwater shall be available to support
22 the pumping of the Parties as allowed herein, and shall not be the property of any individual
23 Party. Subject to the provisions of Section 6.7.2, this Section does not preclude any Party,
24 pursuant to a Storage Agreement, from storing Supplemental Water at its own cost, retaining
25 title thereto, and pumping such water without assessment.

26 **6.4 Resolution of Priorities.** By reason of the long and continuous Overdraft
27 of the Management Area, the contribution of all Parties to the Overdraft, the economies that have
28 developed on the basis of the Overdraft, the severe economic disruption that could occur under

1 strict priorities and the doctrines of prescription and laches, the complexity of determining
2 appropriative priorities, and the need to make the maximum beneficial use of the water resources
3 of the State, the Parties are estopped and barred from asserting specific priorities or preferences
4 to the pumping of Groundwater in the Management Area, except as provided in this Judgment,
5 and the Court finds that the provisions of this Judgment provide for the substantial enjoyment of
6 the respective rights of the Parties.

7 **6.5 Water Management Plan.** The Watermaster will approve and implement
8 a Water Management Plan to enforce and implement the Physical Solution, and may modify
9 such Plan as conditions require, subject to the provisions of the Settlement Agreement. The Plan
10 will also facilitate and accommodate the settlement of the water rights of the Soboba Tribe, and
11 shall be subject to the approval of the Soboba Tribe and the United States as trustee for the Tribe.
12 The Parties agree that the Plan shall incorporate and serve to implement the following goals:

13 6.5.1 Groundwater levels within the Management Area have generally
14 been declining for a number of years, and the Management Area is presently in a condition of
15 Overdraft. The Watermaster shall calculate the Safe Yield of the Management Area on an
16 annual basis, at least until the Overdraft is substantially eliminated. The Plan will, within a
17 reasonable period, eliminate Groundwater Overdraft and provide for excess production by
18 implementing a combination of available water resources management elements. These
19 elements include: reduction in natural Groundwater production; enhanced Recharge with native
20 and/or Supplemental Water; increased use of Recycled Water; in-lieu replenishment; acquisition
21 and development of Supplemental Water; and water conservation programs.

22 6.5.2 The Management Area is expected to experience residential,
23 commercial, and industrial growth and development over the next decade. The estimated
24 amount of Supplemental Water that will be necessary to provide for and adequately serve this
25 new growth and development is 15,000 acre feet per year. The Water Management Plan shall
26 accommodate the orderly expansion of existing water production and service systems, and
27 provide a clear planning process for meeting these projected growth trends.
28

1 6.5.3 The Plan should be implemented in a manner to protect and/or
2 enhance Management Area water quality.

3 6.5.3.1 The Watermaster is authorized to undertake direct
4 operations in connection with reducing, controlling or dealing with Groundwater Degradation,
5 including development or purchase of water supplies of any nature (local private rights, Imported
6 Water, Recycled Water, salvaged water, and/or low quality water).

7 6.5.3.2 The Watermaster is also authorized to provide incentives to
8 the Public Agencies or other Groundwater producers to encourage production of Degraded
9 Groundwater as the Watermaster deems appropriate. For example, the Watermaster could
10 provide that all or some portion of such production would not be charged against the producer's
11 Base Production Rights and/or could adjust or not impose the Administrative and/or
12 Replenishment Assessment otherwise due. The Watermaster may determine the appropriate
13 incentives on a case-by-case basis or may establish a formula or schedule that would reflect or be
14 based on benefits to the Management Area resulting from such production.

15 6.5.3.3 If implementation of certain elements of the Plan causes
16 limited localized water quality Degradation and such Degradation impedes the then current
17 beneficial uses of water by any Public Agency in the Management Area, the Watermaster shall
18 implement appropriate mitigation measures to ensure the water supply to the affected Public
19 Agency, and shall bear the associated cost.

20 6.5.3.4 The standards for local water quality Degradation shall be
21 defined by the Watermaster, and such definitions may be amended from time to time.

22 6.5.4 The Water Management Plan should serve to support the pursuit of
23 cost-effective water supply and water treatment by the Public Agencies, both individually and
24 collectively.

25 6.5.5 The Water Management Plan should serve to protect Tribal Water
26 Rights.

27 6.5.6 The Watermaster shall implement a monitoring program to ensure
28 that Plan activities follow best management and engineering principles to protect Management

1 Area water resources, and to compile and analyze data on Groundwater production, water levels,
2 water quality and Groundwater in storage.

3 **6.6 Replenishment Program.** The Groundwater replenishment program shall
4 be administered by the Watermaster. The program shall include: the acquisition of Supplemental
5 Water; the collection and expenditure of Replenishment Assessments; the Recharge of the
6 Management Area; and the construction and operation of all necessary facilities, including but
7 not limited to, development of surface and subsurface percolation and injection facilities. In
8 addition, a source of Recharge Water for agencies contributing to the Settlement Payment
9 described in Section 5.3 will be Imported Water provided by Metropolitan under the Settlement
10 Agreement, and not used by the Soboba Tribe.

11 6.6.1 Priority for replenishment will be based on an equitable
12 apportionment of available replenishment water among the subbasins after full consideration of:

13 6.6.1.1 The Public Agency's participation in the payment in the
14 Settlement Payment described in Section 5.3.

15 6.6.1.2 Hydrologic conditions in the Management Area.

16 6.6.1.3 The Management Area's Water demands.

17 6.6.1.4 The availability of storage capacity to accommodate the
18 Natural Recharge of surface flows.

19 6.6.1.5 The availability of appropriate conveyance facilities.

20 6.6.1.6 The availability of Supplemental Water,

21 6.6.1.7 Protection of Tribal Water Rights.

22 6.6.2 The Watermaster is encouraged to take advantage of surplus
23 Imported Water from Metropolitan that occasionally may be available at low cost, and to use
24 available assessment funds to bank such Recharge Water against future production in excess of
25 Adjusted Production Rights.

26 6.6.3 The Public Agencies shall independently or jointly operate their
27 present facilities to maximize the existing spreading and Recharge operations of natural flow in
28

1 the Management Area. Such Recharge Water shall be available to support the pumping of all
2 users, and shall not be the property of the spreading Public Agency.

3 6.6.4 All water used to replenish any subbasin in the Management Area
4 shall meet the Regional Water Quality Control Board, Santa Ana Region requirements, and the
5 provisions of Article 4.2 of the Settlement Agreement, and may be used in any subbasin where
6 such requirements are met.

7 6.7 **Storage Rights.** Unused storage capacity may exist in the Management
8 Area, and this capacity will be managed by the Watermaster conjunctively with natural and
9 available Supplemental Water supplies.

10 6.7.1 Subject to availability of assessment funds and unused storage
11 capacity as determined by Watermaster, the Management Area may be Recharged when water is
12 available, to be drawn upon by the Public Agencies in later years when such Supplemental Water
13 may not be available.

14 6.7.2 Unused storage capacity, as determined by Watermaster, and
15 pursuant to a Storage Agreement, may be used for "put and take" operations with Supplemental
16 Water that is paid for by any Public Agency provided that:

17 6.7.2.1 Such operations do not interfere with the rights of any
18 other pumper, or with the use of the storage capacity for Recharge and storage under the Water
19 Management Plan.

20 6.7.2.2 The Watermaster shall have the first right to purchase any
21 water available for Recharge for use under the Plan.

22 6.7.2.3 Later recovery of Stored Water shall exclude losses, and shall not be subject to
23 either Administrative or Replenishment Assessments.

24 6.7.2.4 Such recovered water may be used anywhere within the
25 service area of the Party.

26 6.7.2.5 Such Stored Water may be transferred while still in
27 storage.
28

1 6.7.3 Any conjunctive use programs within the Management Area for
2 the benefit of territory outside of the Management Area shall be subject to the Watermaster's
3 approval and the governance provisions herein. Any storage, conjunctive use programs by third
4 Parties, or in-lieu recharge programs financed with assessment funds, shall be subject to the
5 Watermaster's approval and the governance provisions herein; provided that Metropolitan has
6 the right under the Soboba Settlement Agreement to use up to 40,000 acre-feet of storage
7 capacity in the San Jacinto Upper Pressure Subbasin for the pre-delivery of water required under
8 Section 5.2.

9 6.7.4 Eastern and Lake Hemet have previously provided water for
10 replenishment of the Management Area. As of May 1, 2005 these amounts, less losses, were
11 12,694 acre-feet for Eastern and 950 acre-feet for Lake Hemet. Such Parties shall have Recharge
12 Rights to recover these amounts, less any future losses, without either Administrative or
13 Replenishment Assessments, and may use such Rights to offset excess pumping in lieu of
14 Replenishment Assessments. The water available under such Recharge Rights shall be pumped
15 within 15 years of the entry of this Judgment, but not more than 2000 acre-feet in a single year.
16 The Public Agencies shall notify the Watermaster when such Recharged Water is being pumped,
17 and in what amounts, and the Watermaster shall keep an accounting of the amounts remaining.
18 The use of such credits shall be interpreted and administered so as not to increase the
19 replenishment obligations or assessments of those Parties without such past credits, or after such
20 credits have been fully used.

21 6.7.5 The accounting for recovery of Stored Water or Recharge Water
22 from the Management Area shall not include any water that escapes therefrom and migrates
23 downstream beyond the Management Area. Losses will be calculated based upon best
24 engineering principles.

25 **6.8 Recycled Water.** The use of Recycled Water produced by Eastern can be
26 of substantial benefit in providing additional water in the Management Area. The Watermaster
27 shall have a right of first refusal to purchase all Recycled Water produced from treatment
28

1 facilities serving the Management Area that is not subject to then existing contracts. Such
2 Recycled Water may be used for Recharge or direct use within the Management Area.

3 6.8.1 Each Public Agency may implement its own Recycled Water
4 program, for direct use, subject to the availability of Recycled Water. The Public Agency shall
5 be responsible for financing, operating and maintaining the facilities necessary for that program.
6 The Watermaster will support loan or grant applications, and the Public Agencies will work to
7 integrate Recycled Water into the Water Management Plan, to the extent economically feasible
8 while meeting regulatory standards.

9 6.8.2 Currently only Eastern has Recycled Water available for Recharge.
10 To the extent such Recycled Water is not acquired by the Watermaster for use under the Plan,
11 any such water recharged in the Management Area shall remain the property of Eastern and may
12 be pumped (less losses) without Replenishment Assessments.

13 6.9 **Assessment Program.** The Assessment Program contemplated by the
14 Water Management Plan and consisting of Administrative Assessments and Replenishment
15 Assessments as described in Sections 1.2, 1.30, and 3.4, respectively, shall be administered by
16 Eastern pursuant to a contract with the Watermaster pursuant to the provisions of Section
17 9.6.4(5).

18 6.9.1 All Assessments shall be used for Replenishment Expenses and
19 Administrative Expenses.

20 6.9.2 Subject to the limitations in this Judgment, each Public Agency
21 that produces less than its Adjusted Production Right and share of Imported Water, and any
22 Class B Participant producing less than its Base Production Right, shall have the following
23 Carry-Over Credit:

24 6.9.2.1 Carry-Over Credit shall be the difference in acre-feet
25 between a Public Agency's Adjusted Production Right and share of Imported Water and
26 Supplemental Water, and the Public Agency's actual production in a calendar year, or the Class
27 B Participant's Base Production Right and the Class B Participant's actual production in a
28 calendar year.

1 6.9.2.2 The Carry-Over Credit may be applied to reduce the
2 amount of acre feet upon which a Public Agency or Class B Participant must pay a
3 Replenishment Assessment either for the previous year or in any subsequent year. Carry-Over
4 Credits are transferable by a Public Agency to the Watermaster or, subject to a right of first
5 refusal by the Watermaster, to another Public Agency. Carry-Over Credits may be retained for
6 more than one calendar year. The Public Agencies shall notify the Watermaster if a Carry-Over
7 Credit is being retained. The Public Agencies shall notify the Watermaster if a Carry-Over
8 Credit is being transferred and shall provide information requested by the Watermaster regarding
9 the transfer.

10 6.9.2.3 The Watermaster shall keep an accounting of all
11 Carry-Over Credits.

12 6.9.3 All Watermaster assessment invoices shall be payable to
13 Watermaster within 60 days of notice. Any delinquent assessments shall bear interest at a rate to
14 be set by the Watermaster. Watermaster is entitled to recover its reasonable expenses in
15 collecting any assessment, including attorney's fees and costs.

16 6.9.4 The Watermaster is authorized to adjust assessments, where
17 deemed appropriate, to provide incentives for production of Degraded Groundwater as described
18 in Section 6.5.3.

19 **6.10 Export.** The Public Agencies may export water outside the Management
20 Area, on a temporary basis, upon approval by the Watermaster. However, any water exported
21 shall be replenished with an appropriate amount of similar or better quality water as determined
22 by Watermaster. Water exports by the Public Agencies shall not interfere with the Water
23 Management Plan or any other Public Agency's operations. The Water Management Plan will
24 set forth the specific criteria for the export of water, including, but not limited to, conjunctive use
25 programs.

26 **6.11 Capital Facilities.** Each Public Agency shall continue to own its existing
27 capital facilities for water supply and management, subject to the provisions of Section 9.6.6.
28 However, the Phase I capital facilities necessary to implement the Water Management Plan shall

1 be owned and operated by Eastern, pursuant to the Plan and in a fiduciary capacity for the benefit
2 of all Parties under this Judgment, pursuant to Sections 5.4; 9.6.4(1); 9.6.4(3).

3 6.11.1 Financing of Water Management Plan facilities may be funded by
4 assessments, regional capital fees, loans and grants, contributions for Storage Rights by
5 Metropolitan or other third-parties, and municipal bonds. Responsibility for the costs of future
6 capital facilities necessary to implement the Plan, beyond the Phase I facilities, shall be
7 determined by the Watermaster and apportioned based on relative benefit to be derived by each
8 Public Agency.

9 6.11.2 Any of the participating Public Agencies may propose projects to
10 be included in the Water Management Plan to increase the Management Area water supply.
11 Such proposals, after evaluation by the Watermaster, shall be included or rejected. If the
12 Watermaster chooses to reject the proposal, the proposing Public Agency may implement the
13 rejected project at its own cost so long as it does not significantly impact the implementation of
14 the Management Plan and/or interfere with the ongoing production by the Public Agencies.

15 **7. INJUNCTION.**

16 Each Party and his, her or its officers, agents, employees, successors and assigns,
17 is enjoined and restrained from:

18 7.1 Producing water from the Management Area without payment of required
19 Administrative Assessments.

20 7.2 Producing water from the Management Area in excess of the Party's
21 Adjusted Production Right and share of Imported Water, or the Base Production Right in the
22 case of a Class B Participant, without payment of required Replenishment Assessments.

23 7.3 Transferring Production Rights except as authorized in this Judgment.

24 7.4 Recharging water in the Management Area except as authorized in this
25 Judgment.

26 7.5 Storing or exporting water except as authorized in this Judgment.
27
28

1 **8. CONTINUING JURISDICTION.**

2 **8.1 Full Jurisdiction.** Full jurisdiction, power and authority is reserved to the
3 Court as to all matters contained in this Judgment, including expedited intervention by
4 successors in interest to Private Pumpers, except:

5 8.1.1 To redetermine Base Production Rights of the Public Agencies or
6 Class B Participants.

7 8.1.2 As otherwise limited by law.

8 **8.2 Motion to Interpret.** By motion to the Court, upon 30 days written
9 notice and after hearing, any Party or Watermaster may request the Court to make such further or
10 supplemental orders to interpret, enforce, carry-out or amend this Judgment. Any such motion
11 shall be reviewed de novo by the Court. Any such motion shall be served on all Parties and
12 Watermaster at the addresses on the Watermaster's notice list.

13 **9. WATERMASTER.**

14 **9.1 Composition.** The Watermaster shall consist of a board composed of one
15 elected official and one alternate selected by each of the Public Agencies and one Private
16 Pumper representative and one alternate selected by the Class A and Class B Private Pumpers.

17 **9.2 Terms.** Each member of the Watermaster shall serve until replaced by the
18 Public Agency or Private Pumpers that made the original appointment, provided, however, that
19 the election or removal of a Private Pumper representative shall be decided by a majority vote of
20 the Class A and Class B Participants attending a meeting called for that purpose by written notice
21 sent to each Class A and Class B Participant or their successors, by U. S. mail or electronic mail
22 at least ten (10) days before such meeting. Said notice shall include the date, time and location
23 of the meeting.

24 **9.3 Removal and Replacement.** Any Watermaster member may be removed
25 and replaced by the same procedure used in his or her appointment.

26 **9.4 Voting.** Each member of the Watermaster shall have one vote. Four
27 affirmative votes shall be required in order to constitute Watermaster action on each of the
28 following matters. (1) any change sought in the form of governance; (2) any change in voting

1 requirements; (3) retaining the services of legal counsel and Advisor; (4) establishing, levying,
2 increasing or decreasing all assessment amounts; (5) adopting or amending an annual budget; (6)
3 determining the extent of Overdraft and quantifying Safe Yield; (7) determining Adjusted
4 Production Rights; (8) decisions regarding the financing of Supplemental Water or facilities,
5 other than any financing provisions included in this Stipulated Judgment as provided in Sections
6 5.3, 5.4, 5.5 hereof; (9) decisions regarding ownership of facilities, other than ownership of the
7 Phase I facilities described in the Water Management Plan, which shall be owned by Eastern
8 Municipal Water District, subject to a right of use by those Parties participating in the financing
9 thereof; (10) policies for the management of the Management Area; (11) and any decision that
10 involves a substantial commitment by the Watermaster, including any contracts for conserved
11 water. All other actions by the Watermaster shall require three affirmative votes.

12 **9.5 Court Review.** Any action by the Watermaster, or any failure to act by
13 virtue of insufficient votes, may be reviewed by the Court on motion by any Party, with notice to
14 all other Parties. The Court's review shall be de novo, and the Court's decision shall constitute
15 action by the Watermaster.

16 **9.6 Powers and Duties.** In order to implement the provisions of this
17 Judgment, the Watermaster shall have the following duties and powers:

18 **9.6.1 Water Management Plan.** Watermaster shall develop and
19 implement a Water Management Plan, with such additions and modifications as may from time
20 to time be appropriate, and shall administer the provisions of this Judgment. The Water
21 Management Plan shall be subject to approval by the Court, by the Soboba Tribe, and by the
22 United States.

23 **9.6.2 Independent Counsel.** The Watermaster shall retain independent
24 legal counsel to provide such legal services as the Watermaster may direct.

25 **9.6.3 Advisor.** The Watermaster shall retain either an independent
26 engineering firm or qualified individual experienced in hydrology to evaluate and analyze the
27 data collected by Eastern, and any conclusions based thereon, and to make recommendations to
28 the Watermaster, referred to herein as "Advisor." The Advisor shall also provide general

1 coordination among Eastern, the Technical Advisory Committee and the Watermaster with
2 respect to their respective functions, and perform such executive functions as the Watermaster
3 may direct. The Watermaster reserves the right to refer any matter it may choose to any Person
4 it may select for assistance in carrying out its duties under this Judgment.

5 **9.6.4 Operations and Other Functions.**

6 **9.6.4.1 Operations – Phase I Facilities.** The Phase I Facilities
7 (including capital facilities and spreading basins, as more particularly defined in the Water
8 Management Plan) are either existing facilities of Eastern that will be expanded or improved as
9 part of the Water Management Plan, or are new facilities that will be integrated into Eastern's
10 existing facilities and will be owned by Eastern. Pursuant to the terms and conditions of
11 contracts to be entered into between Eastern and the Watermaster, and Eastern and the other
12 Public Agencies, Eastern shall construct, install, and operate the Phase I Facilities consistent with
13 the Water Management Plan.

14 **9.6.4.2 Operations – Other Facilities.** The Water Management
15 Plan anticipates the need for the construction and installation of other facilities in order to
16 accomplish the goals of the Judgment. Such facilities may be constructed, installed and operated
17 under contract with the Watermaster, by a member of the Watermaster or, in circumstances
18 approved by the Watermaster, by other responsible entities.

19 **9.6.4.3 Purchase of Water for Groundwater Recharge.** The
20 Soboba settlement requires Metropolitan to use its best efforts to deliver an average of 7500
21 acre-feet per year of Imported Water for Recharge of the Management Area. This supply is
22 dedicated first to satisfy the rights of the Soboba Tribe as provided in the Settlement Agreement.
23 Such portion of the supply that is not used by the Soboba Tribe will be available to those Parties
24 who have participated in the cost thereof. Subject to the approval of the Watermaster, Eastern
25 shall enter into a contract with Metropolitan for the purchase and delivery of such Imported
26 Water supply. Eastern shall also purchase as a member agency of Metropolitan, or otherwise
27 acquire, such additional supplies of water as may be directed by the Watermaster to implement
28 the Water Management Plan, subject to availability and transmission capacity. All such water

1 delivered by Metropolitan, or otherwise acquired by Eastern, and all Eastern facilities used to
2 deliver, recharge and recapture such water, shall be subject to rights of use by the Parties entitled
3 thereto. Such rights of use shall be confirmed in detail in written contracts with Eastern.

4 Recycled water is also available for direct and indirect Groundwater Recharge from Eastern's
5 wastewater treatment facilities serving the Management Area. The Watermaster shall have a
6 right of first refusal to purchase all Recycled Water produced from such plants that is not subject
7 to then existing contracts. The Watermaster is authorized to use its funds, or funds provided by
8 the Parties, to purchase Imported Water, Supplemental Water, or other water.

9 **9.6.4.4 Data Collection.** The Watermaster shall provide for the
10 collection and maintenance of all production, water level, water quality, and other technical data
11 necessary under or required by the Water Management Plan ("Data"). Pursuant to the terms and
12 conditions of a contract to be entered into between Eastern and the Watermaster, Eastern shall
13 collect and maintain all such Data and transmit such Data to the Watermaster, its Advisor, and
14 the Technical Advisory Committee as directed by the Watermaster. The foregoing clause does
15 not restrict the ability of the Watermaster to enter into other agreements with other members of
16 the Watermaster and/or private firms and individuals for the collection of Data.

17 **9.6.4.5 Accounting.**

18 **9.6.4.5.1 Financial Accounting.** The Watermaster shall
19 provide for the levy, billing, and collection of all assessments provided for under the Judgment,
20 for the payment of costs and expenses of the Watermaster, and for the performance of such
21 accounting and related functions as may be required in connection with those functions
22 ("Accounting Functions"). All funds collected shall be held in a segregated account. All
23 expenses and disbursements shall be separately accounted for. Pursuant to the terms and
24 conditions of a contract to be entered into between Eastern and the Watermaster, Eastern shall
25 initially perform the Accounting Functions for Watermaster. The foregoing clause does not
26 restrict the ability of the Watermaster to enter into other agreements with other members of the
27 Watermaster and/or private firms and individuals to provide some or all of the Accounting
28 Functions.

9.6.4.5.2 Water Use, Storage and Transfers. The Watermaster shall account for all production by Class A and Class B Participants and Public Agencies using information reported or obtained for that purpose. The Watermaster shall also account for Carry-Over Credits, including the transfer thereof where authorized, and for the use and/or storage and/or transfers of Imported Water by Public Agencies.

9.6.5 Technical Advisory Committee. There has been a Technical Advisory Committee that has functioned throughout the development of the Water Management Principles and Plan, and this Stipulated Judgment. That Committee has been composed of such managerial and technical representatives as the individual Parties decide to appoint. Each Party has paid the costs of its own representatives, and shall continue to do so in the future. The Technical Advisory Committee shall continue to function, and to provide such technical assistance as the Watermaster may request. The Technical Advisory Committee shall make recommendations to the Watermaster's Advisor and to the Watermaster on all matters requiring four votes for Watermaster action, and shall receive from Eastern all data associated with such matters for its review and evaluation. The Technical Advisory Committee and its members shall also function as a way to keep the City Councils, Boards of Directors and participating Private Pumpers fully informed about the implementation of this Judgment.

9.6.6 Reservation of Rights. The Watermaster reserves the right to assume, on its own, any functions set forth in Section 9.6.4, except as provided in Section 9.6.4(1), and to undertake all other acts required to implement the Plan and this Judgment, so long as it is legally capable of performing such functions. The Watermaster, if it should choose, may also act through or in conjunction with the other Public Agencies, or through a Joint Powers Agency composed of all the Public Agencies hereunder. Except as specifically provided in Section 9.6.4(1) with respect to Eastern's facilities used in Phase I, the Watermaster shall have no right to use or acquire the water facilities of any of the Parties, without their consent, provided that it is the intent of the Parties that their individual facilities will be available where appropriate to implement the Water Management Plan, upon terms equitable to all Parties, and consistent with their respective obligations to their own customers.

1 **9.6.7 Rules and Regulations.** The Watermaster may make such rules
2 and regulations as may be necessary for its own operations as well as for the operation of the
3 Plan and this Judgment, subject to Court approval. Meetings of the Watermaster shall be subject
4 to the Brown Act .

5 **9.6.8 Reports to Court.** The Watermaster shall file annually with the
6 Court, and serve on all Parties, a report regarding its activities during the preceding year,
7 including an audited statement of all accounts and financial activities.

8 **9.6.9 Notice to Parties.** Watermaster shall maintain a current list of the
9 Parties and their addresses for notice purposes. Rules for service shall be governed by the
10 California Code of Civil Procedure and the California Rules of Court. Each Party shall notify
11 Watermaster in writing of the name and address for its receipt of notice and service under this
12 Judgment. A Party may change this information by written notice to Watermaster. Notice shall
13 be deemed sufficient if directed to the most recent address provided by the Watermaster.

14 **9.7 Watermaster Records.** Watermaster's records shall be kept at the office
15 of Eastern unless changed by the Watermaster and approved by the Court. These records shall
16 be treated as public records under the Public Records Act. California Government Code sections
17 6250-6277 (West 1995 and Supp. 2002).

18 **10. MISCELLANEOUS.**

19 **10.1 Intervention After Judgment.** A New Pumper can intervene in this
20 action as a Class A Participant only, pursuant to Section 4.6. Any other Person who is an heir,
21 successor or assign of an existing Party, may become a Party to this action and Judgment, subject
22 to the conditions contained herein, by filing a petition in intervention. The petition may be filed
23 and approved ex parte with notice to the Watermaster. Such intervener shall thereafter be a Party
24 bound by this Judgment, and entitled to the rights and privileges accorded under this Judgment to
25 the Party such Person succeeds in this action.

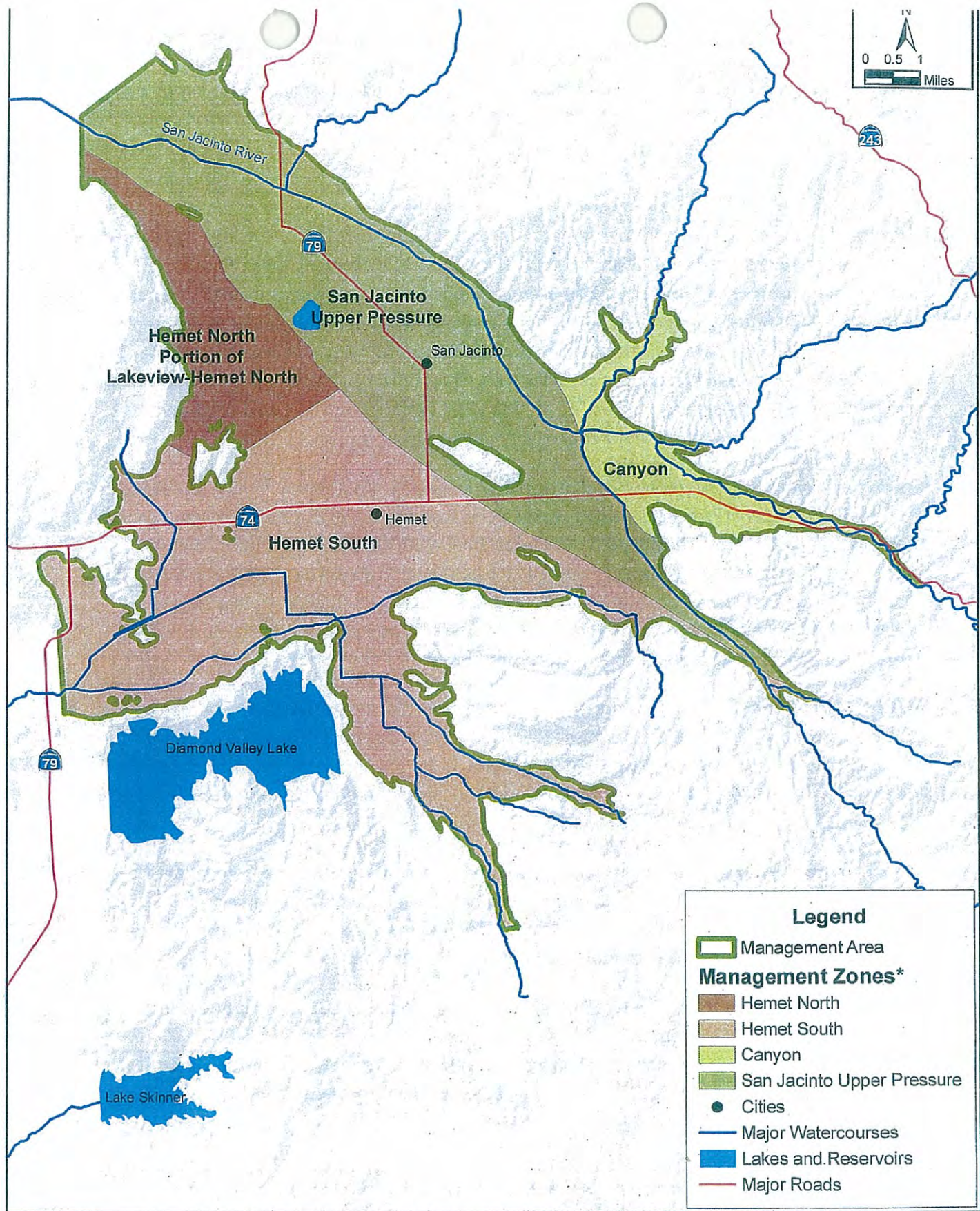
26 **10.2 Loss of Rights.** No right adjudicated in this Judgment shall be lost by
27 non-use, abandonment, forfeiture or otherwise, except upon a written election by the owner of
28 the right filed with Watermaster, or by order of the Court upon noticed motion and after hearing.

1 **10.3. Attorney's Fees and Costs.** No Party shall recover any attorney's fees or
2 costs in this proceeding from any Party.
3

4
5 DATED: 4/18, 20¹³/₁₂
6

M.P. PAULETTE D. BARKLEY
Commissioner, Superior Court of
~~California, Riverside County~~
JUDGE OF THE SUPERIOR COURT

EXHIBIT A



Legend

- Management Area
- Management Zones***
- Hemet North
- Hemet South
- Canyon
- San Jacinto Upper Pressure
- Cities
- Major Watercourses
- Lakes and Reservoirs
- Major Roads



Management Area and Management Zones

Hemet / San Jacinto Water Management Plan

*Source: EMWD

July 2006

Figure 1.1

Appendix H - Soboba Settlement Agreement

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SOBOBA BAND OF LUISEÑO INDIANS
SETTLEMENT AGREEMENT

THIS SETTLEMENT AGREEMENT is entered into by the Soboba Band of Luiseño Indians on behalf of itself and its members (collectively, the "Soboba Tribe"); the United States of America solely in its capacity as trustee for the Soboba Tribe (the "United States"); the Eastern Municipal Water District ("EMWD"); the Lake Hemet Municipal Water District ("LHMWD"); and The Metropolitan Water District of Southern California ("MWD").

ARTICLE 1- RECITALS

1.1 The Soboba Tribe has made claims against EMWD and LHMWD (collectively, the "Local Districts") for alleged infringement of its water rights in the San Jacinto River ("River") and the Canyon Sub-basin and the Intake portion of the Upper Pressure Sub-basin associated therewith (collectively "Basin") in Riverside County, California, and for damages related to historical interference with the Soboba Tribe's rights and the unauthorized use of its water. Specifically, the Soboba Tribe alleges that the Local Districts, through their longstanding diversion of waters from the River and pumping of Groundwater from the Basin, have interfered with the Soboba Tribe's water resources and its rights to the beneficial use and enjoyment of the Reservation.

1.2 The Soboba Tribe also has filed a lawsuit against MWD styled *Soboba Band of Luiseño Indians v. Metropolitan Water District of Southern California*, United States District Court Case No. 00-04208 GAF (MANx) (the "Action"). The Action alleges that MWD, by the construction and operation of the San Jacinto Tunnel (the "Tunnel"), has interfered with the Soboba Tribe's water resources and its rights to the beneficial use and enjoyment of the Reservation.

1.3 The Parties have agreed to settle the Soboba Tribe's claims on the terms set forth in this Settlement Agreement.

1.4 MWD also contends that it has legal indemnification claims and other rights against EMWD for the Action arising out of MWD Board Resolution 3940 (EMWD's Terms of Annexation into MWD). In 1951, EMWD was created and annexed into MWD for the purposes of resolving claims that MWD's construction and operation of the Tunnel interfered with local water rights in the Basin and to obtain a supplemental supply of water for the area. The Terms of Annexation required EMWD to resolve potentially conflicting rights to the Tunnel seepage water and that MWD annually credit EMWD for the entire amount of Tunnel seepage, which MWD has done every year since 1951. In exchange for the benefits of being annexed into the MWD service area and the return of the Tunnel seepage water to EMWD, EMWD was required to defend and indemnify Metropolitan from certain claims seeking recovery for loss or injury as a consequence of the Tunnel seepage, specifically including claims brought by the Tribe. In response to the Tribe's Action, MWD tendered the defense and indemnity of the Tribe's claims to EMWD, which EMWD declined on the grounds that the Action allegedly exceeded the scope of its obligations under the Terms of Annexation. MWD subsequently filed a third party action against EMWD seeking to enforce the defense and indemnity provisions contained in the Terms of Annexation. EMWD and MWD dispute each other's contentions.

1.5 EMWD and MWD have agreed as part of this settlement to resolve their dispute over the scope of EMWD's defense and indemnity obligations to MWD reflected in the EMWD's Terms of Annexation.

NOW, THEREFORE, in consideration of the promises and agreements hereinafter set forth, the Parties agree as follows:

ARTICLE 2 - DEFINITIONS

This Settlement Agreement employs abbreviated terms that have the meanings below. To the extent that the definitions below conflict with those terms defined in other sections of the Settlement Agreement, the definitions in Article 2 shall prevail.

2.1 "Act" unless otherwise indicated, shall mean the Soboba Settlement Act approving this Settlement Agreement, attached as Exhibit A.

2.2 “Action” means the Soboba Tribe’s lawsuit against MWD styled Soboba Band of Luiseño Indians v. Metropolitan Water District of Southern California, United States District Court Case No. 00-04208 GAF (MANx) and includes MWD’s third party claim against EMWD.

2.3 “AFA” means acre-foot of water per annum.

2.4 “Basin” means collectively the Canyon Sub-basin and the Intake portion of the Upper Pressure Sub-basin as depicted on Exhibit B (map) and described in Exhibit C.

2.5 “Best Efforts” means that the Districts will take all commercially reasonable actions to fulfill the referenced contractual obligation.

2.6 “Canyon Sub-basin” means the groundwater basin as depicted on Exhibit B (map) and described in Exhibit C.

2.7 “Court” shall mean the Federal District Court for the Central District of California, Central Division, which has exercised jurisdiction over the Action.

2.8 “Decree Court” means the court with jurisdiction over the judgment and decree entered in accordance with this Settlement Agreement.

2.9 “Districts” means EMWD, LHMWD, and MWD.

2.10 “Effective Date” means the date on which the Secretary causes to be published in the Federal Register a statement of findings that the conditions in Section 3.1 have been fulfilled.

2.11 “EMWD” means the Eastern Municipal Water District.

2.12 “Groundwater” for the purposes of this Settlement Agreement means all water beneath the surface of the earth.

2.13 “Imported Water” means water sold by MWD to EMWD pursuant to Section 4.4 and is not intended to have the same meaning as the term “Imported Water” as used in MWD’s Administrative Code.

2.14 “Intake Sub-basin” means the portion of the Upper Pressure groundwater Sub-basin as depicted on Exhibit B (map) and described in Exhibit C.

2.15 “LHMWD” means the Lake Hemet Municipal Water District.

- 2.16 "Local Districts" means EMWD and LHMWD.
- 2.17 "MWD" means The Metropolitan Water District of Southern California.
- 2.18 "Party" is the singular form of "Parties," which means the entities represented by the signatories to this Settlement Agreement.
- 2.19 "Recharge Facilities" means those facilities to be constructed by the Local Districts pursuant to Section 4.4.G of this Settlement Agreement for the purpose of recharging the Imported Water into the Basin.
- 2.20 "Reservation" means the Soboba Indian Reservation as depicted on Exhibit D (map), comprising approximately 5,935 acres, as established by Executive Order on June 19, 1883; thereafter expanded by Executive Orders on January 29, 1887, and December 29, 1891, the purchase of 709.65 acres known as "Tract 8" in 1911, the issuance of a trust patent for 68.9 acres in 1913, and the transfer of 880 acres pursuant to the Southern California Indian Land Transfer Act, Pub. L. No. 100-581, 102 Stat. 2946 (1988); and, thereafter modified by Executive Orders of March 22, 1886, and January 29, 1887, and the issuance of a fee patent for 32.84 acres in 1900. It does not include the 950 acres northwest of and contiguous to the Reservation known as the "Jones Ranch," purchased by the Soboba Tribe in fee on July 21, 2001, and placed into trust on January 13, 2003, nor the 535 acres southeast of and contiguous to the Reservation known as the "Horseshoe Grande," purchased by the Soboba Tribe in fee in seven separate transactions in June and December 2001, December 2004; June 2006 and January 2007, nor the 478 acres north of and contiguous to the Reservation known as "The Oaks," purchased by the Soboba Tribe in fee on April 4, 2004.
- 2.21 "River" means the surface flow of the San Jacinto River and its tributaries from its origins in the San Jacinto Mountains into and across the Basin as shown on Exhibit B (map).
- 2.22 "Secretary" means the Secretary of the Interior or her designee.
- 2.23 "Settlement Agreement" means this document including all exhibits, which are incorporated by reference, as amended to be consistent with the Act.

2.24 "Soboba Tribe" means the Soboba Band of Luiseño Indians, a body politic and federally recognized Indian tribe, and its individual members.

2.25 "Surface Water" means all surface water flows of the River.

2.26 "Terms of Annexation" means Metropolitan Resolution No. 3940 which sets forth the terms of EMWD's annexation to MWD.

2.27 "Tribal Water Right" means the Soboba Tribe's rights to water set forth in Section 4.1.

2.28 "Tunnel" means that portion of the Colorado River Aqueduct known as the San Jacinto Tunnel.

2.29 "United States," unless otherwise indicated, means the United States of America solely in its capacity as trustee on behalf of the Soboba Tribe or its members.

2.30 "Untreated Replenishment Water" means untreated water sold pursuant to the Replenishment Service program as defined by MWD's Administrative Code at sections 4104, 4114 and 4514.

2.31 "Upper Pressure Sub-basin" means the groundwater basin as depicted on Exhibit B (map).

2.32 "WMP" means the Water Management Plan that will be developed by EMWD, LHMWD, the City of Hemet, the City of San Jacinto and other Basin users, pursuant to Section 4.8.A of this Settlement Agreement, to manage the Canyon Sub-basin, the Upper Pressure Sub-basin downstream to Bridge Street, and the Hemet Basins. The principles of the Water Management Plan are attached as Exhibit E. The area covered by the Water Management Plan is depicted on Exhibit F (map) and described in Exhibit G.

ARTICLE 3 – CONDITIONS PRECEDENT AND ENFORCEMENT

3.1 This Settlement Agreement shall become enforceable, and the releases and waivers of Article 5 effective, as of the date the Secretary causes to be published in the Federal Register a statement of findings that the following conditions have been fulfilled:

A. the Act has been enacted;

B. to the extent that the Settlement Agreement conflicts with the Act, the Settlement Agreement has been revised to conform with the Act;

C. the Settlement Agreement, as so revised, and the Waivers and Releases have been executed by the Parties and the Secretary;

D. warranty deeds for the property to be conveyed in fee to the Soboba Tribe pursuant to Section 4.6 have been placed in escrow with instructions that they shall be delivered to the Soboba Tribe by close of business on the first business day following the date that all of the conditions in this paragraph have been fulfilled;

E. the Soboba Tribe and the United States have approved the WMP; and

F. the Judgment and Decree attached to the Settlement Agreement as Exhibit H or a judgment and decree substantially the same as Exhibit H has been approved by the United States District Court, Eastern Division of the Central District of California, and that judgment and decree has become final and nonappealable.

3.2 Other than to take all necessary steps to cause the events described in this Article to occur, no Party shall be required to perform any of the obligations, or be entitled to any of the benefits, under this Settlement Agreement before all conditions precedent have been fulfilled. After the fulfillment of all conditions precedent, the Parties shall be bound by all provisions of this Settlement Agreement.

3.3 If all of the conditions listed in Section 3.1 have not been fulfilled by March 1, 2012, this Settlement Agreement shall be null and void, and any consideration, together with any income earned thereon, shall be returned to the depositing entity.

ARTICLE 4 - TRIBAL WATER RIGHTS

4.1 Water Rights. The Parties ratify, confirm, declare to be valid and agree not to object to or dispute or challenge in any judicial or administrative proceedings the rights of the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe, to the water rights set forth in this Section. In so doing, the Parties acknowledge that these rights are the result of bargained for and exchanged concessions, as a result of which the Local Districts

have agreed to supply water to the Soboba Tribe if it is unable, except for mechanical failure of its wells, pumps or water facilities, to produce the water to which it is entitled under this Article. Therefore, the Soboba Tribe shall have the following water rights which shall be held in trust by the United States for the benefit of the Soboba Tribe:

A. The prior and paramount right, superior to all others, to pump 9,000 AFA from the Basin for any use on the Reservation and lands now owned or hereafter acquired by the Soboba Tribe contiguous to the Reservation or within the Basin.

B. The Soboba Tribe's right to pump a total of 9,000 AFA from the Basin is without regard to whether the water was naturally or artificially recharged.

C. In the event the Soboba Tribe is unable, except for mechanical failure of its wells, pumps or water facilities, to produce from its existing wells or equivalent replacements up to 3,000 AFA production from the Canyon Sub-basin and the remainder of its Tribal Water Right from the Intake Sub-basin, subject to Section 4.3.A, the Local Districts shall deliver any shortage to the Soboba Tribe. Any shortage shall be delivered at such locations as the Soboba Tribe and the Local Districts may agree, or if there is no agreement, at the wellheads where the shortage occurred. Such water may be supplied from Local District wells in either the Canyon or Intake Sub-basins, or from other sources. For any water delivered pursuant to this paragraph, the Soboba Tribe shall pay an acre-foot charge equal to its then current cost of production, and any avoided cost of treatment, from the wells where the shortage occurred, assuming pumping lifts equal to the Soboba Tribe's averages in the respective Sub-basins over the preceding ten years.

4.2 Water Quality. Recharged water placed in the Canyon Sub-basin by Local Districts and/or the WMP and any replacement water delivered to the Soboba Tribe pursuant to Section 4.3.C shall conform to all applicable State water quality regulations and, without prior written approval from the Soboba Tribe, shall neither exceed (1) any Federal or State of California primary or secondary drinking water standards (except with respect to recharged water, turbidity, color, or coliform bacteria) nor (2) 0.3 milligrams per liter (mg/l) boron or 0.05 mg/l lithium. Recharged water placed in the Intake Sub-basin by EMWD, LHMWD, and/or the

WMP shall conform to all applicable State water quality regulations. Nothing in this paragraph shall affect the water quality obligations assumed by Metropolitan for Imported Water set forth in Section 4.4.

4.3 Soboba Tribe's Water Use. Beginning on the Effective Date, the Soboba Tribe's right to pump groundwater in the exercise of its Tribal Water Right shall be subject to the following provisions:

A. The Soboba Tribe agrees to limit its exercise of the Tribal Water Right to 4,100 AFA for a period of fifty (50) years commencing with the Effective Date, according to the schedule set forth in Exhibit I to this Settlement Agreement. Should the Soboba Tribe during that period identify a need for water in addition to the Schedule set forth in Exhibit I, the Soboba Tribe shall have the right to purchase water from the WMP at the rate then being charged to the WMP's municipal producers.

B. Any use of the Tribal Water Right by an individual member of the Soboba Tribe shall be satisfied out of the water resources provided to the Soboba Tribe in this Settlement Agreement.

C. In addition to the limitation in Section 4.3.A, the Soboba Tribe may enter into contracts and options to lease or contracts and options to exchange water made available to it under this Settlement Agreement, or enter into contracts and options to postpone existing water uses or postpone undertaking new or expanded water uses. Any such water thereby made available to others shall only be used by participants in, or other users within the area of, the WMP. No contract shall be for a term exceeding one hundred (100) years, nor shall any contract provide for permanent alienation of any portion of the Tribal Water Right.

4.4 Purchase of Imported Water [see definition of Imported Water in Section 2.13 of this Settlement Agreement]. In order to provide water to the Soboba Tribe and to reduce the overdraft of the Basin, EMWD and MWD agree to enter into a contract pursuant to which MWD will sell and EMWD on behalf of the WMP will purchase the Imported Water under the following terms:

A. Price. The Imported Water will be sold by MWD to EMWD at the then prevailing service rate charged by MWD for Untreated Replenishment Water, which rate is reflected in MWD's Administrative Code at section 4401(a)(2). As of the date this Settlement Agreement is signed by MWD, the service rate for such water is \$238 per acre foot. Changes in the rates charged for Imported Water shall be effective the same date that the new rates for Untreated Replenishment Water become applicable to MWD's member agencies. Should MWD ever discontinue the delivery of Untreated Replenishment Water, the service rate for water supplied pursuant to this contract shall initially be determined by taking the last published service rate for Untreated Replenishment Water and charged to EMWD under this contract. Thereafter, the rate for Imported Water would continue to be adjusted on the same percentage basis as MWD's service rate for the non-interruptible untreated water deliveries to its member agencies, which adjustments shall become effective on the same date that the new service rates become applicable to MWD's member agencies.

B. Use. For purposes of the Imported Water only, MWD releases EMWD from all covenants that now, or may in the future, require that water purchased at the service rate for Untreated Replenishment Water be left in the ground or otherwise not used for any period of time.

C. Duration. The contract shall commence upon the Effective Date and will expire on December 31, 2035. EMWD and MWD agree to negotiate in good faith a possible extension of this water sale contract for an additional period which, when added to the original term expiring on December 31, 2035, would provide for a total term of 50 years. In determining whether or not to extend the term of this contract for this additional period, MWD will consider the current status of its replenishment water program, the status of MWD's State Water Project contract, the implementation of this Settlement Agreement, and any other information that MWD deems relevant to the possible extension of the water sale contract. Nothing in this paragraph shall be construed to require MWD to extend the water sale contract.

D. Water Quality. Water sold by MWD pursuant to this contract shall be of a quality

that is consistent with MWD's operational and water quality goals. MWD agrees to make Best Efforts to meet water quality objectives set by the Santa Ana Regional Water Quality Control Board for recharged water being put into the Basin. MWD takes no risks associated with any discrepancy between the water quality obligations assumed by MWD pursuant to this paragraph and water quality standards applicable to recharged water set by the Santa Ana Regional Water Quality Control Board or other regulatory body.

E. Deliveries. Deliveries under this contract shall not begin until the Effective Date. Once deliveries are commenced, MWD shall use Best Efforts to deliver 7,500 AFA for the duration of the contract based upon 15-year averages. Annual deliveries shall be calculated on a January 1 to December 31 calendar year and shall be pro rated for any portion of a year during which the contract is in force. MWD reserves the right to deliver water at any time of the year. MWD shall give EMWD advance notice of Imported Water deliveries as provided for in MWD's then current Administrative Code and implementing guidelines for replenishment water deliveries, which presently is reflected in section 4514(c) of MWD's Administrative Code.

F. Point of Delivery. Deliveries shall be made by MWD to EMWD at the connection known as EM-14 or, upon mutual agreement of MWD and EMWD, at one or more additional existing or future connections. The Parties acknowledge that the suspension or termination of deliveries to EM-14 may, at any time, as determined by MWD's Chief Executive Officer, be required to meet MWD's operational needs. If deliveries to this location are suspended or terminated, then EMWD and MWD agree to negotiate in good faith to identify an alternative delivery point or points and, if MWD and EMWD are unable to reach agreement, the dispute shall be resolved by the Decree Court.

G. Recharge Facilities. The Local Districts, through the WMP, shall construct, operate, and maintain facilities for artificial Groundwater recharge and banking of the Imported Water. Said facilities shall be sufficient to accommodate a flow rate of 42 cubic feet per second and to store up to 40,000 acre feet of Imported Water in the Basin. MWD shall have a paramount right to use capacity in the Recharge Facilities sufficient to accommodate a flow rate of 42 cubic

feet per second and a paramount right to store up to 40,000 acre feet of Imported Water to meet its obligations under this Settlement Agreement, provided that MWD's sole remedy if the required storage capacity is not made available is to reduce its obligation by the amount of water that it was prepared but unable to deliver due to the lack of storage capacity. MWD's obligations under this Section 4.4 shall not arise until the Recharge Facilities are capable of meeting the capacity and storage requirements set forth in this paragraph.

H. Postponed Deliveries. EMWD shall have the right to postpone deliveries during periods when the Recharge Facilities are not capable of meeting the capacity and storage requirements set forth in Section 4.4.G, provided that each of the following four conditions are met: (i) the inability to meet capacity and storage requirements is the result of events beyond the control of the Local Districts and/or the WMP; (ii) the inability to meet capacity and storage requirements is not the result of negligence on the part of the Local Districts and/or the WMP; (iii) the inability to meet capacity and storage requirements is not the result of water quality limitations that are more restrictive than those established pursuant to Section 4.4.D, and (iv) that the Local Districts use Best Efforts to make necessary repairs and/or take other actions necessary to make the Recharge Facilities fully operational.

(1) If the conditions for postponed deliveries are met as required herein, MWD shall make up such deferred deliveries at a later time, to the extent that MWD has Untreated Replenishment Water available.

(2) If the conditions for postponed deliveries are not met as required herein, then MWD's obligation to deliver water shall be reduced by the amount of water that MWD was prepared to deliver, subject to the 42 cubic feet per second maximum flow rate, and the existence of unused storage capacity up to the 40,000 acre-foot maximum.

I. Pre-Deliveries. MWD shall have complete discretion concerning use of the 40,000 acre feet of storage capacity for the pre-delivery of Imported Water, including the right not to use such capacity. As such, MWD makes no commitments to pre-deliver any amount of Imported Water.

4.5 Funding for Infrastructure. In accordance with the Act, the United States shall establish in the Treasury of the United States a fund in the amount of \$10,000,000, managed by the Secretary of the Interior, which may be drawn upon by EMWD to pay or reimburse costs associated with constructing, operating, and maintaining that portion of the Recharge Facilities necessary to accommodate deliveries of the Imported Water.

4.6 Land Transfer.

A. EMWD Property. In settlement of the Action, EMWD shall place into escrow a warranty deed conveying to the Soboba Tribe in fee all of the property presently owned by EMWD at Domenigoni Parkway and Highway 79, consisting of approximately 106 acres which is described and illustrated in Exhibit J to this Settlement Agreement. The escrow instructions shall provide that the warranty deed shall be delivered to the Soboba Tribe by close of business on the first business day following the Effective Date.

B. MWD Property. In settlement of the Action, MWD shall place into escrow a warranty deed conveying to the Soboba Tribe in fee property presently owned by MWD at Domenigoni Parkway and Patterson Avenue, consisting of approximately 21.7 acres which is described and illustrated in Exhibit K to this Settlement Agreement. The escrow instructions shall provide that the warranty deed shall be delivered to the Soboba Tribe by close of business on the first business day following the Effective Date.

C. Use of Property. Management and development by the Soboba Tribe of the lands transferred by this paragraph shall comply with all applicable Federal law. Any regulation by the Soboba Tribe of the environment on, under or above such lands that impacts MWD's operations, including but not limited to its operations related to Diamond Valley Reservoir, shall be consistent with, and no more stringent than, comparable regulation by the United States and the State of California.

4.7 Development Funds.

A. Local Districts. No later than 120 days after the Effective Date and before any funds are released to the Local Districts under Section 4.5, the Local Districts shall pay to the

Soboba Tribe the sum of \$7,000,000 plus interest at the average daily prime rate (as reported by the Wall Street Journal) plus two and one-quarter percent (2.25%) per annum from the Effective Date until paid. No later than 120 days after any funds are released to the Local Districts under Section 4.5, the Local Districts shall pay to the Soboba Tribe a sum equal in amount to the funds so released plus interest at the average daily prime rate (as reported by the Wall Street Journal) plus two and one-quarter percent (2.25%) per annum from the date of the release of such funds until paid. All sums paid to the Tribe by the Local Districts pursuant to this Section 4.7.A are determined to be non-trust funds and shall be managed by the Soboba Tribe in its sole discretion. The United States shall have no responsibility with respect to the funds provided to the Soboba Tribe pursuant to this paragraph.

B. United States. In accordance with the Act, the United States shall establish in the Treasury of the United States a trust fund in the amount of \$11,000,000, managed by the Secretary of the Interior in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 et seq.) and this Settlement Agreement. There shall be no expenditures from the trust fund until the conditions in Section 3.1 are fulfilled.

(1) Investment of the Fund. The Secretary shall invest amounts in this fund in accordance with the Act of April 1, 1880 (21 Stat. 70, ch. 41, 25 U.S.C. 161), the first section of the Act of June 24, 1938 (52 Stat. 1037, ch. 648, 25 U.S.C. 162a), and this paragraph.

(2) Fund Uses. This fund may be drawn upon by the Soboba Tribe with the approval of the Secretary to pay or reimburse costs associated with constructing, operating, and maintaining water and sewage infrastructure or other water-related development projects.

4.8 Other Terms.

A. The Local Districts, with the cooperation of other Groundwater producers in the Basin, shall develop and implement a WMP for the Basin that will address the current Basin overdraft, and recognize and take into account the Tribal Water Right. The WMP shall not be final or deemed effective for the purposes of this Settlement until it is approved by the Soboba Tribe and the United States. No implementation or subsequent modification of the WMP shall

threaten or adversely affect the rights of the Soboba Tribe hereunder, and the Soboba Tribe and the United States reserve the right under the continuing jurisdiction of the Decree Court to litigate any such issue.

B. EMWD will credit to the Soboba Tribe the sum of \$1,000,000 to be deducted from the cost of water and sewage financial participation fees (connection fees) and similar fees charged by EMWD for any property owned by the Soboba Tribe within EMWD's then existing service area for which service is sought pursuant to an agreement for service between the Soboba Tribe and EMWD. The Soboba Tribe and EMWD agree to negotiate in good faith concerning any future agreement for service which shall be funded in whole or in part by the credit established pursuant to this paragraph.

C. LHMWD will make available for habitat preservation and/or environmental mitigation purposes property it owns in the San Jacinto River bed, consisting of approximately 12 acres which is described and illustrated in Exhibit L to this Settlement Agreement. This property shall be used for habitat preservation and/or environmental mitigation to assist in meeting the requirements of applicable Federal and State environmental laws relating to the Recharge Facilities.

D. The Soboba Tribe agrees to provide the Local Districts with all information reasonably available to the Soboba Tribe that the Local Districts and the Soboba Tribe agree is required to implement this Settlement Agreement and the WMP.

E. MWD shall not be joined in any legal proceeding to enforce the Tribal Water Right described in Sections 4.1 through 4.3 or which concerns the duties and obligations reflected at Section 4.8, paragraphs A through E, unless said proceeding relates to MWD's failure to perform its obligations to deliver water set forth in Section 4.4.

ARTICLE 5 - RELEASES AND WAIVERS

5.1 Soboba Tribe

A. The Soboba Tribe, on behalf of itself and its members, and the United States solely in its capacity as trustee for the Tribe releases EMWD, LHMWD, and MWD for:

(1) Past, present and future claims to Surface and Groundwater rights for the Reservation, arising from time immemorial through the Effective Date and anytime thereafter, except claims to enforce this Settlement Agreement or claims based on water rights acquired after the Effective Date;

(2) Past, present and future claims for injury of any kind arising from interference with Surface water and Groundwater resources and water rights of the Reservation, including, but not limited to, all claims for injury to the Soboba Tribe's use and enjoyment of the Reservation, economic development, religion, language, social structure and culture, and injury to the natural resources of the Reservation, from time immemorial through the Effective Date;

(3) Past, present and future claims for injury of any kind arising from, or in any way related to, continuing interference with Surface water and Groundwater resources and water rights of the Reservation, including the full scope of claims defined in Section 5.1.A(2), to the extent that such continuing interference began prior to the Effective Date, from time immemorial through the Effective Date and anytime thereafter;

(4) Past, present and future claims for injury of any kind arising from, or in any way related to, seepage of water into the Tunnel, including the full scope of claims defined in Section 5.1.A(2), from time immemorial through the Effective Date and anytime thereafter; and

(5) Past, present and future claims for injury of any kind arising from, or in any way related to, the WMP as approved in accordance with this Settlement Agreement, from time immemorial through the Effective Date and anytime thereafter.

B. The Soboba Tribe, on behalf of itself and its members, releases the United States for:

(1) Claims described in Section 5.1.A(1)-(5);

(2) Past, present and future claims for failure to acquire or develop water rights and water resources of the Reservation arising from time immemorial through the Effective Date and anytime thereafter;

(3) Past, present and future claims for failure to protect water rights and water

resources of the Reservation arising from time immemorial through the Effective Date, and any past, present and future claims for any continuing failure to protect water rights and water resources of the Reservation, arising from time immemorial through the Effective Date and, to the extent that such continuing failure to protect began before the Effective Date, anytime thereafter;

(4) Past, present and future claims arising from the failure of any non-federal Party to fulfill the terms of this Settlement Agreement at anytime.

(5) Past, present, and future claims arising out of the negotiation of this Settlement Agreement or the negotiation and enactment of the Act, or any specific terms or provisions thereof, including but not limited to the Soboba Tribe's consent to limit the number of participant parties to this Settlement Agreement.

C. The releases contained in Section 5.1.B shall take effect on the date on which the all of the amounts under Sections 4.5 and 4.7.B are appropriated.

(1) All periods of limitation and time-based equitable defenses applicable to the claims set forth in Section 5.1.B are tolled for the period between the date of enactment of the Act until the date on which all of the amounts under Sections 4.5 and 4.7.B are appropriated.

(2) This Section 5.1.C neither revives any claim nor tolls any period of limitation or time-based equitable defense that may have expired before the date of enactment of the Act.

(3) The making of the amounts of appropriations under Sections 4.5 and 4.7.B shall constitute a complete defense to any claim which involves the claims set forth in Section 5.1.B pending in any court of the United States on the date on which the appropriations are made.

D. The Soboba Tribe, on behalf of itself and its members, expressly preserves as against all Parties all rights and remedies relating to:

- (1) The enforcement of this Settlement Agreement;
- (2) The infringement of any water rights arising under Federal or State law which may be appurtenant to property, other than the Reservation, that is now owned or hereafter acquired by the Soboba Tribe, excepting claims identified in Section 5.1.A(4), which relate to

Tunnel seepage, and any challenge to approved portions of the WMP.

E. The Soboba Tribe agrees to defend, indemnify, and hold harmless EMWD, LHMWD, MWD, and the United States for any claim seeking damages or other form of relief based upon the rights released by the Soboba Tribe in Section 5.1.A and B, and all of their respective subparts.

F. Notwithstanding the waivers and releases in Section 5.1.A, the United States retains all claims relating to violations of the Clean Water Act, the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, Resource Conservation and Recovery Act, and the regulations implementing these Acts, including, but not limited to claims related to water quality.

5.2 EMWD

A. EMWD shall release LHMWD, MWD, the Soboba Tribe, and the United States from:

(1) All past and present claims arising from or in any way related to the claims released by the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe in Section 5.1, A and B, and all of their respective subparts; and

(2) All past and present claims arising from, or in any way related to, interference with EMWD's Surface and Groundwater rights under Federal or State law from time immemorial through the Effective Date, including, but not limited to, all rights originally belonging to EMWD's predecessors and/or otherwise acquired by EMWD prior to the Effective Date .

B. Notwithstanding the dispute between EMWD and MWD over the scope of EMWD's defense and indemnity obligations reflected in Section 8 of Resolution 3940 (the Terms of Annexation) or the language of Section 8, EMWD shall defend and indemnify MWD against all demands, claims, suits, or other administrative or legal proceedings arising from, or in anyway connected to, the infiltration of water into the Tunnel. This obligation shall apply irrespective of when the claim arose or the alleged infringement, harm, or injury occurred.

- C. EMWD expressly preserves all rights and remedies relating to:
- (1) As against all Parties, the enforcement of this Settlement Agreement;
 - (2) As against all Parties, the infringement of any water rights arising under State law acquired in the future by EMWD; and
 - (3) As against MWD, the Terms of Annexation, except as expressly agreed to in Section 5.2.B.

5.3 LHMWD

A. LHMWD shall release EMWD, MWD, the Soboba Tribe, and the United States from:

- (1) All past and present claims arising from or in any way related to the claims released by the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe in Section 5.1.A and B, and all of their respective subparts; and
- (2) All past and present claims arising from, or in any way related to, interference with LHMWD's Surface and Groundwater rights under Federal or State law from time immemorial through Effective Date.

B. LHMWD expressly preserves all rights and remedies relating to:

- (1) As against all Parties, the enforcement of this Settlement Agreement; and
- (2) As against all Parties, the infringement of any water rights arising under State law acquired in the future by LHMWD.

5.4 MWD

A. MWD shall release EMWD, LHMWD, the Soboba Tribe, and the United States from:

- (1) All past and present claims arising from or in any way related to the claims released by the Soboba Tribe and the United States solely in its capacity as trustee for the Soboba Tribe in Section 5.1.A and B, and all of their respective subparts; and
- (2) All past and present claims arising from, or in any way related to, interference with MWD's Surface and Groundwater rights under Federal or State law from time immemorial

through the Effective Date .

B. MWD expressly preserves all rights and remedies relating to:

(1) As against all Parties, the enforcement of this Settlement Agreement;

(2) As against all Parties, the infringement of any water rights arising under State law acquired in the future by MWD; and

(3) As against EMWD, the Terms of Annexation, except as expressly agreed to in Section 5.2.B.

5.5 All Parties Release of Unknown Claims.

A. Each Party acknowledges and agrees that certain of the releases reflected in Sections 5.1 through 5.5 apply to all claims whether known or unknown to the releasing Party.

B. Each Party certifies that it has read the following provisions of California Civil Code Section 1542:

“A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him must have materially affected his settlement with the debtor.”

C. Each Party waives the application of California Civil Code Section 1542. In doing so, each Party acknowledges that it is consciously releasing claims that may exist as of the date of this release but which it does not know exist, and which, if known, would materially affect its decision to execute this Settlement Agreement, regardless of whether the Parties' lack of knowledge is the result of ignorance, oversight, error, negligence, or any other cause.

5.6 Consent to Jurisdiction. The United States consents to jurisdiction in the Action for the purpose of obtaining approval for a judgment and decree substantially the same as the judgment and decree attached to this Settlement Agreement as Exhibit H.

A. Nothing in this Agreement restricts, enlarges, or otherwise determines the subject matter jurisdiction of any Federal, State, or Tribal court.

B. Nothing in this Agreement confers jurisdiction on any State court to enforce Federal environmental laws regarding the duties of the United States or conduct judicial review

of Federal agency action.

ARTICLE 6- ADMINISTRATION AND OTHER CONSIDERATIONS

6.1 Disclaimer. Nothing in this Settlement Agreement shall be construed as establishing any standard to be used for the quantification of Federal reserved rights, aboriginal claims, or any other Indian claims to water or lands in any judicial or administrative forum or proceeding. Nothing in this Settlement Agreement shall be construed to quantify or otherwise affect the water rights, claims or entitlements to water of any California tribe, band or community other than the Soboba Tribe.

6.2 Evidentiary Effect of Negotiations. This Settlement Agreement has been arrived at in the process of good faith negotiation for the purpose of resolving legal disputes, including pending litigation, and all Parties agree that no conduct, statements, offers, or compromises made in the course thereof shall be construed as admissions against interest or be used in any legal forum or proceeding other than one for approval, confirmation, interpretation, or enforcement of this Settlement Agreement.

6.3 Authorship. The Parties agree that this Settlement Agreement reflects the joint drafting efforts of all Parties. In the event that any dispute, disagreement, or controversy arises regarding this Settlement Agreement, the Parties shall be considered joint authors and no provision shall be interpreted against any Party because of authorship.

6.4 Authorization to Execute. Each Party represents and warrants that she or he is authorized to execute this Settlement Agreement on behalf of the respective Parties to this Settlement Agreement and does so freely and voluntarily.

6.5 Effect of Execution by the Districts. Execution of this Settlement Agreement by the Districts signifies that provisions of this Settlement Agreement affecting the Districts have been approved by their respective Boards of Directors, and these agencies assume the obligations of and are entitled to the benefits of this Settlement Agreement.

6.6 No Inducements. Each Party acknowledges and represents that in executing this Settlement Agreement it has not relied upon any inducements, promises, or representations made by the other Parties which are not reflected in this Settlement Agreement.

6.7 Advice of Counsel. Each Party warrants and represents that, in executing this Settlement Agreement, it has relied upon legal advice from counsel of its choice; that the terms of this Settlement Agreement have been read and its consequences have been completely explained to it by counsel; and that it fully understands the terms of this Settlement Agreement.

6.8 Contingent on Appropriation of Funds. The expenditure or advance of any money or the performance of any obligation by the United States under this Settlement Agreement is contingent upon appropriation of funds therefor. If funds are not appropriated, the United States shall accrue no liability.

6.9 Officials Not to Benefit. No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Settlement Agreement or to any benefit that may arise from this Settlement Agreement. This restriction shall not be construed to extend to this Settlement Agreement if made with a corporation or company for its general benefit.

6.10 Counterparts. This Settlement Agreement may be signed in counterparts by one or more of the Parties, and those counterparts, when taken together, shall have the same force and effect as if a single, original document had been signed by all the Parties.

6.11 Jurisdiction. The Decree Court retains jurisdiction over the Judgment and Decree and the Settlement Agreement.

6.12 Governing Law. This Settlement Agreement shall be construed in accordance with Federal laws and where appropriate the laws of the State of California.

6.13 Successors and Assigns. This Settlement Agreement and the attached waivers and agreements shall, unless otherwise indicated, be binding on and inure to the benefit of the Parties, and their respective successors and assigns.

6.14 Integration. This Settlement Agreement incorporates all the exhibits and sets forth the entire agreement of the Parties with respect to the subject matter hereof, with the exception that EMWD and MWD have resolved certain rights and obligations by way of a Partial Settlement Agreement dated November 14, 2001 which shall remain binding on those two Parties only. This Settlement Agreement may be amended only by written agreement executed by the Parties.

ARTICLE 7- NOTICE AND SIGNATURES

7.1 Notices. Any notice or other communication given under this Settlement Agreement must be in writing and delivered by overnight courier service or certified mail, return receipt requested, postage prepaid and properly addressed to the Parties at the addresses listed below (or to any other or further addresses the Parties may subsequently designate by notice in this manner). All these notices and communication shall be effective when delivery to the required recipient is completed in accordance with this paragraph:

To the Soboba Tribe:

Chairperson
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581

To the United States of America:

Asst. Secretary for Indian Affairs
U.S. Department of the Interior
1849 C St. NW 4104 MIB
Washington, DC 20240-0001

Chief, U.S. Dept. of Justice
Indian Resources Section
P.O. Box 44378
L'Enfant Plaza Station
Washington, DC 20026-4378

cc: Regional Director
Bureau of Indian Affairs
Pacific Region
2800 Cottage Way
Sacramento, CA 95825

To EMWD:

General Manager
Eastern Municipal Water District
P.O. Box 8300
Perris, CA 92572-8300

To LHMWD:

General Manager
Lake Hemet Municipal Water District
P.O. Box 5039
Hemet, CA 92544

To MWD:

Chief Executive Officer
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, California 90054-0153

General Counsel
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, California 90054-0153

IN WITNESS WHEREOF, the Parties have executed this Settlement Agreement on the
day and year written below.

SOBOBA BAND OF LUISEÑO INDIANS

Date: March 12, 2008

By: Rosemary Morillo
Rosemary Morillo, Vice Chairwoman

THE UNITED STATES OF AMERICA

Date: _____

By: _____

THE EASTERN MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
David J. Slawson, President

THE LAKE HEMET MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
Frank Douglas Marshall III, President

THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA

Date: _____

By: _____
Jeffrey Kightlinger, General Manager

IN WITNESS WHEREOF, the Parties have executed this Settlement Agreement on the
day and year written below.

SOBOBA BAND OF LUISEÑO INDIANS

Date: _____

By: _____
Rosemary Morillo, Vice Chairwoman

THE UNITED STATES OF AMERICA

Date: _____

By: _____

THE EASTERN MUNICIPAL WATER
DISTRICT

Date: _____

By: David J. Slawson
David J. Slawson, President

THE LAKE HEMET MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
Frank Douglas Marshall III, President

THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA

Date: _____

By: _____
Jeffrey Kightlinger, General Manager

IN WITNESS WHEREOF, the Parties have executed this Settlement Agreement on the
day and year written below.

SOBOBA BAND OF LUISEÑO INDIANS

Date: _____

By: _____
Rosemary Morillo, Vice Chairwoman

THE UNITED STATES OF AMERICA

Date: _____

By: _____


THE EASTERN MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
David J. Slawson, President

THE LAKE HEMET MUNICIPAL WATER
DISTRICT

Date: _____

By:  _____
Frank Douglas Marshall III, President

THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA

Date: _____

By: _____
Jeffrey Kightlinger, General Manager

IN WITNESS WHEREOF, the Parties have executed this Settlement Agreement on the
day and year written below.

SOBOBA BAND OF LUISEÑO INDIANS

Date: _____

By: _____
Rosemary Morillo, Vice Chairwoman

THE UNITED STATES OF AMERICA

Date: _____

By: _____

THE EASTERN MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
David J. Slawson, President

THE LAKE HEMET MUNICIPAL WATER
DISTRICT

Date: _____

By: _____
Frank Douglas Marshall III, President

THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA

Date 3/11/08

By: _____
Jeffrey Kightlinger, General Manager

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Appendix I - Water Shortage Contingency Plan

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ARTICLE 10 – WATER SHORTAGE CONTINGENCY PLAN⁹⁰

5.1001 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 water use during water shortages.

Financial Impacts

In the event that EMWD was to implement the Water Shortage Contingency Plan (the Plan), it is recognized that the reductions 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), EMWD will utilize its Rate Stabilization Reserve to mitigate any shortfall.

Priorities

The Plan is based on the following priorities:

- Public safety, healthy, and welfare
- Sustaining economic vitality

⁹⁰ Article 10 added to Title 5 by Resolution No. 2014-033 on March 26, 2014.

- Quality of life

5.1002 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.

5.1003 COORDINATION WITH REGIONAL WATER PLANNING GROUPS

Coordination and implementation of this Plan are in concert with regional water planning groups including MWD and EMWD sub-agencies – Lake Hemet Municipal Water District, Nuevo Water Company, Rancho California Water District, and the cities of Perris, Hemet, and San Jacinto.

5.1004 SHORTAGE DECLARATION PROCESS

(a) Long and Short Term Water Deficiencies

Driven by the requirements outlined in Water Code 10632, and the demand for potable water expected to be in excess of the water supply, EMWD's General Manager shall request the Board of Directors to authorize and implement the provisions of the Plan. The request shall be made at a regular or special meeting of the Board of Directors, to implement provisions of the Plan. The Board of Directors has 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 a potable water shortage emergency and to implement the appropriate water shortage contingency measures. The General Manager shall report such water shortage conditions and the level of response to the Board of Directors in a timely manner.

The declaration of the Board of Directors 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.

5.1005 APPLICATION

The water shortage contingency measures of the Plan shall apply to all persons, customers, and properties 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.

5.1006 DEFINITIONS

For the purposes of this Plan, the following definitions shall apply:

Commercial, Industrial, and Institutional (CII): Includes, but is not limited to, any type of 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 consumptions 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.

EMWD: Eastern Municipal Water District.

Domestic water: Used for personal needs or for household or sanitary purposes such as drinking, bathing, cooking, sanitation, or for cleaning a residence, business, industry, or institution. Also used for landscape irrigation.

Household: Residential premises served by the customer's meter.

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.

Long Term Shortage: A prolonged shortage of water supplies expected to last at least a year.

Potable water: Filtered/treated water suitable for drinking; also used for household needs and landscape irrigation.

Short Term Shortage: A shortage of water supplies expected to last less than a year.

Water Shortage Contingency Plan: The Plan as defined by this document.

Water shortage: A condition in which the existing or projected potable water supply available to EMWD is not adequate 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 EMWD's allocation from the MWD, drought, emergency conditions or failures of water distribution systems.

Water shortage period: The period beginning on the effective date of the Board of Director's approval of implementing EMWD's Water Shortage Contingency Plan, and ending on the date of the Board of Director's finding that a potable water shortage no longer exists.

**5.1007 PROCESS FOR INITIATION/TERMINATION OF WATER SHORTAGE
CONTINGENCY STAGES AND MODIFICATION OF ACTIONS TAKEN IN
EACH STAGE⁹¹**

The General Manager will recommend the appropriate stage of response to a water shortage based on the best information available at the time. Conditions that will be considered include:

- EMWD water supply conditions and storage levels
- Statewide water supply conditions
- Local water supply and demand conditions
- MWD Water Supply Allocation Plan implementation or other actions requiring a reduction in water demand
- Actions by surrounding agencies

As water supply conditions either deteriorate or improve, the General Manager will return to the Board to revise the appropriate stage of response. It shall not be necessary to implement any stage prior to another; the stages may be implemented in any reasonable order.

In the event the State or local agencies, through executive action, emergency legislation or other actions, impose conditions, requirements, or procedures that are not included in the District water shortage Contingency Plan, the General Manager is authorized to implement such measures as are reasonably required

⁹¹ Section 5.1007 amended by Resolution No. 2014-098 on July 2, 2014.

to bring the District's actions in each stage into functional conformity with such conditions, requirements, or procedures.

5.1008 PUBLIC NOTIFICATION PROCEDURES

When EMWD determines that a potable water shortage condition exists, any or all of the following notification procedures may be implemented:

- (a) Notify the general public stakeholders, elected officials and other key decision-makers regarding the situation, actions to be taken, goals customers are intended to achieve, and how these actions will be implemented.
- (b) The public at large will be informed of the situation and actions EMWD will be taking. Communications will occur through any of the following: billing inserts, special mailings, telephone contact, e-mail, social media, roadway signage, water conservation booths, and other booths in the community, speaker's bureau, community association meetings, newsletters, and education programs, etc. Literature appropriate to the drought circumstance will be provided regarding the potable water shortage condition, conservation methods, and water-savings devices.
- (c) Use of all forms of media will be employed. This would include public service announcements on radio and cable television, social media as well as earned media and advertisements in local newspapers.
- (d) EMWD's web site, www.emwd.org, will be the central location for messaging and customer communications.

5.1009 WATER SHORTAGE CONTINGENCY PLAN STAGES AND ENFORCEMENT^{92,93}

EMWD will implement an appropriate stage based on current water conditions. Higher stages will be implemented as shortages continue and/or if customer response does not bring about desired water savings. Restrictions, penalties and enforcement will build on each other as higher stages are implemented.

Stage 1: Supply Watch

At this stage, efforts will be focused on encouraging voluntary reduction of up to 10 percent. Customers can reduce demand by following the water use efficiency requirements of Section 5, Article 6 - Water Conservation of the Administrative Code. Other actions may be encouraged as appropriate.

Demand reduction will be encouraged through the on-going enforcement listed in Section 5, Article 6 - Water Conservation of the Administrative Code including EMWD's water budget based tiered rate and penalties for run off.

Stage 2: Supply Alert

At this stage efforts will be focused on a voluntary reduction of up to 25 percent. Customers can reduce demand by following the water use efficiency requirements of Section 5, Article 6 - Water Conservation of the Administrative Code. Voluntary customer actions could include the following:

- (a) Reduce watering or irrigating of lawn, landscape or other vegetated areas with sprinklers by one day a week.

⁹² Section 5.1009 amended by Resolution No. 2015-011 on March 18, 2015.

⁹³ Section 5.1009 amended by Resolution No. 2015-103 on August 19, 2015.

- (b) All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system repaired within 48 hours.
- (c) Refrain from filling or re-filling of ornamental lakes or ponds.
- (d) Refrain from using potable water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not.

Demand reduction will be encouraged through the ongoing enforcement listed in Section 5, Article 6 - Water Conservation of the Administrative Code including EMWD's water budget based tiered rate and penalties for run off.

Stage 3: Mandatory Waste Reduction

At this stage, efforts will be focused on a mandatory reduction of excessive water use. Customers can reduce demand by following the conserving actions detailed in Stages 1 and 2.

Demand reduction will be enforced through changes to EMWD's water budget-based tiered rate structure and observation-based penalties:

For tiered customers:

- (a) Stage 3a: No variances or adjustments will be allowed for filling swimming pools, establishing landscape or leaks that are not repaired within 48 hours.
- (b) Stage 3b: Tier 3 budgets will be decreased by up to 50 percent.
- (c) Stage 3c: Tier 3 budgets will be decreased by up to 100 percent.

Observation of any water waste in opposition to restrictions listed in Section 5, Article 6 - Water Conservation of the Administrative Code or under this or any previous stage of the Plan are subject to the following penalties:

(a) For multi-family, commercial, institutional, industrial, agricultural, and landscape accounts:

(1) For the first violation, the District shall issue a written notice of fact of such violation to the Customer.

(2) For a second violation a surcharge in the amount of \$100.00 shall be added to the Customer's water bill.

(3) For a third violation a surcharge in the amount of \$200.00 shall be added to the Customer's water bill.

(4) For a fourth and any subsequent violation a surcharge of \$300.00 shall be added to the Customer's water bill.

(b) For single-family residential accounts:

(1) For the first violation, the District shall issue a written notice of fact of such violation to the Customer.

(2) For a second violation a surcharge in the amount of \$25.00 shall be added to the Customer's water bill.

(3) For a third violation a surcharge in the amount of \$50.00 shall be added to the Customer's water bill.

(4) For a fourth and any subsequent violation a surcharge of \$100.00 shall be added to the Customer's water bill.

Stage 4: Mandatory Outdoor Reduction

At this stage efforts will be focused on a mandatory reduction of outdoor water use. Customers can reduce demand by following the conserving actions required in Stages 1 through 3 and limiting watering or irrigating of lawn, landscape or other vegetated areas with sprinklers to the following schedule:

(a) June through August – A maximum of two days a week

- (b) September through May – A maximum of one day a week

Demand reduction will be enforced through changes to EMWD's water budget based tiered rate structure and observation based penalties:

For tiered customers:

- (a) Stage 4a: Tier 2 budgets will be decreased by 10 percent.
- (b) Stage 4b: Tier 2 budgets will be decreased by up to 50 percent.
- (c) Stage 4c: Tier 2 budgets will be decreased by up to 100 percent.

Observation of any water waste in opposition to restrictions listed in Section 5, Article 6 - Water Conservation of the Administrative Code or under this or any previous stage of the Plan are subject to the following penalties:

- (a) For multi-family, commercial, institutional, industrial, agricultural, and landscape accounts:

- (1) For the first violation, the District shall issue a written notice of fact of such violation to the Customer.
 - (2) For a second violation a surcharge in the amount of \$200.00 shall be added to the Customer's water bill.
 - (3) For a third violation a surcharge in the amount of \$400.00 shall be added to the Customer's water bill.
 - (4) For a fourth and any subsequent violation a surcharge of \$600.00 shall be added to the Customer's water bill.

- (b) For single-family residential accounts:

- (1) For the first violation, the District shall issue a written notice of fact of such violation to the Customer.
 - (2) For a second violation a surcharge in the amount of \$50.00 shall be added to the Customer's water bill.

(3) For a third violation a surcharge in the amount of \$100.00 shall be added to the Customer's water bill.

(4) For a fourth and any subsequent violation a surcharge of \$200.00 shall be added to the Customer's water bill.

Stage 5: Mandatory Indoor Reduction

At this stage efforts will be focused on a mandatory reduction of indoor water use. This stage would only be implemented in response to a catastrophic loss of supplies requiring a 50 percent or more reduction in demand.

Demand reduction will be enforced through changes to EMWD's water budget based tiered rate structure and penalties for run off as detailed in Section 5, Article 6 - Water Conservation of the Administrative Code:

For tiered customers:

(a) Stage 5a: Tier 1 budgets will be decreased by 10 percent.

(b) Stage 5b: Tier 1 budgets will be decreased by up to 30 percent.

(c) Stage 5c: Tier 1 budgets will be decreased by up to 50 percent.

Commercial, Industrial, Institutional, Agricultural customers and any other customer without a water budget will be given a water budget based on historical water use. Allocations will be decreased in stages and the current Tier 4 rate will be applied to any use above the decreased allocation.

(a) Stage 5a: Budgets will be decreased by 10 percent.

(b) Stage 5b: Budgets will be decreased by up to 30 percent.

(c) Stage 5c: Budgets will be decreased by up to 50 percent.

5.1010 APPEALS PROCESS

All variance requests and appeals will be processed according to Section 5, Article 6 – Water Conservation of the Administrative Code.

5.1011 WHOLESALE SUPPLY ALLOCATION AND PENALTIES

During mandatory water shortage stages, wholesale customers will be required to reduce their retail water demand equivalent to EMWD's retail water demand reduction. If MWD has limited supply allocations to EMWD and other member agencies; supply to wholesale customers may be allocated using a formula and methodology based on the MWD Water Supply Allocation Plan.

Potential penalties for not reducing demand could be up to 4 times the MWD Tier 2 rate.

Appendix J - 2013-2014 CUWCC BMP Reports

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CUWCC BMP Retail Coverage Report 2013

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

1004 Eastern Municipal Water District - Retail

**1. Conservation Coordinator
provided with necessary resources
to implement BMPs?**

Name:

Stacy Rodriguez

Title:

Conservation Programs Supervisor

Email:

rodriguezs@emwd.org

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.			
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Retail Coverage Report 2013
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

1004 Eastern Municipal Water District - Retail

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

EMWD AWWA WAS v5 FY12-13.xls

AWWA Water Audit Validity Score? 79

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? Yes

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
187	6748308	854788	0		357624.35	

At Least As effective As

No

N/A

Exemption

No

Comments:

The Operational Efficiency fields aren't saving above. Here are the fields requested:

*App Losses/conn/day: 6.78
*Real Losses/conn/day: 31.96
*Real Losses/main/day: N/A
*Real Losses/conn/day/psi: 0.43
*UARL: 2836.94
*CARL: 5327.05
*ILI: 1.8



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

1004 Eastern Municipal Water District - Retail

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	3436
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes
Date: 7/1/1997	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As

Yes

na

Exemption

No

Comments:

na



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

Exempt

1004 Eastern Municipal Water District - Retail

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Allocation Based	Yes	57875827.7	16006488.16
Dedicated Irrigation	Allocation Based	Yes	14211575.65	1156669.11
Multi-Family	Allocation Based	Yes	5967238.55	1235058.55
Commercial	Uniform	Yes	5598889.99	999757.75
Industrial	Uniform	Yes	1196299.81	48974.87
Institutional	Uniform	Yes	3260750.56	559882.3
			88110582.26	20006830.74

Calculate: $V / (V + M)$

81 %

Implementation Option: Use Annual Revenue As Reported

☐

Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes

Customer Class	Rate Type	Conserving Rate?
Single-Family	Increasing Block	Yes
Multi-Family	Increasing Block	Yes
Commercial	Uniform	Yes
Industrial	Uniform	Yes
Institutional	Uniform	Yes

At Least As effective As

Yes

See uploaded Memo

Exemption

Yes

Cost Effectiveness

Comments:

EMWD allocated water rates have an indoor component that encourage the efficient use of water indoors. Since the implementation of allocation based water rate EMWD has seen a 4% reduction of wastewater treatment flows per person in entire district



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

1004 Eastern Municipal Water District - Retail

Retail

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Eastern Municipal Water District - Wholesale, Western MWD of Riverside County - Wholesale
Riverside Public Utilities - Clay Monroe
Rancho California Water District - Meggan Valencia

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
Newsletter articles on conservation	15
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	586400
Website	34693
Landscape water conservation media campaigns	142000
General water conservation information	4000
Email Messages	33583
Total	800691

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	18
News releases	6
Newspaper contacts	200
Television contacts	4
Radio contacts	15
Total	243

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Outreach Budget	1198235
Total Amount:	1198235

Description of all other Public Outreach programs



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Inland Empire Garden Friendly Plant SalesWRCOG Energy & Water Conservation Program promotion

Comments:

At Least As effective As

No

Exemption

No

0



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

1004 Eastern Municipal Water District - Retail

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Metropolitan Water District of SC

Materials meet state education framework requirements? Yes

All EMWD Water education materials are in alignment with the CCS for the corresponding grade levels

Materials distributed to K-6? Yes

Curriculum packets, which include journals, assessments, worksheets, and books. Also include Water Fun, Water Times, Water Ways, and Admiral Splash.

Materials distributed to 7-12 students? Yes (Info Only)

Annual budget for school education program:

304621.00

Description of all other water supplier education programs

presentations, assemblies, field trips, contests, Solar Cup, career days, health fairs, festivals. etc...

Comments:

At Least As effective As

No

Exemption

No

0



Flex Track Summary Report

Foundational Best Management Practices For Urban Water Efficiency

1004 Eastern Municipal Water District - Retail

BMP	ACTUAL	TARGET	PRIOR CREDIT	Coverage option	STATUS
BMP 3	136.43	638.55	5596.550	Flextrack	ON TRACK
BMP 4	120.89		-195.600	Flextrack	
BMP 5	1747.71	786.34	2913.51	Flextrack	ON TRACK
TOTAL	1043.66	1424.89	8314.46		On Track



CUWCC BMP Wholesale Coverage Report 2013

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Wholesale Agency Assistance Programs

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Name: Stacy Rodriguez Email: rodriguezs@emwd.org

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resources	
BMP 2.1 Public Outreach	1197756		
BMP 2.2 School Education Program	330631		

b) Technical Support

c) Retail Agency

d) Water Shortage Allocation

Adoption Date: 4/1/2009

File Name:

e) Non signatory Reporting of BMP implementation by non-signatory Agencies

Eastern has no non-Signatory Reporting for its sub-agencies. Our sub-agencies are relatively small with limited staff.

f) Encourage CUWCC Membership List Efforts to Recruit Retailers

We have quarterly meetings with our sub-agencies in which we have discussed BMP Reporting. We offered assistance in completing those reports and communicated the benefits of becoming a signatory.

At Least As effective As

No

We do have public education & marketing outreach that is provided to all of our sub-agencies.

Exemption

No

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

Appendix R - EMWD AWWA WAS v5.0 FY13-14.xls

AWWA Water Audit Validity Score?

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? Yes

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
187	6748308	854788		True	357624.35	

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	No
Feasibility Study provided to CUWCC?	No
Date:	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	<input type="text" value="No"/>
Exemption	<input type="text" value="No"/>
Comments:	



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Wholesale

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with public outreach

City of Perris, Eastern Municipal Water District - Retail, Lake Hemet Municipal Water District, Nuevo Water Company, Rancho California Water District, Western MWD of Riverside County - Retail

Riverside Public Utilities - Clay Monroe, City of Hemet -

Agency Name	ID number
City of Perris	7000
Eastern Municipal Water District - Retail	1004
Lake Hemet Municipal Water District	7009
Nuevo Water Company	7011
Rancho California Water District	6986
Western MWD of Riverside County - Retail	1006

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
Newsletter articles on conservation	22
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	688839
Website	37103
Landscape water conservation media campaigns	142000
General water conservation information	3500
Email Messages	53671
Total	925135

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	9
News releases	3
Newspaper contacts	200
Radio contacts	15
Television contacts	4
Total	231

Did at least one website update take place during each quarter of the reporting year? Yes



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Outreach Expenses	1118431
Total Amount:	1118431

Description of all other Public Outreach programs

Inland Empire Garden Friendly Plant SalesWRCOG Energy & Water Conservation Program Promotion

Comments:

At Least As effective As

No

Exemption

No

0



CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Wholesale

Does your agency implement School Education programs? Yes

The list of retail agencies your agency assists with public outreach

Eastern Municipal Water District - Retail, Elsinore Valley MWD - Retail, Lake Hemet Municipal Water District, Nuevo Water Company, Rancho California Water District, Western MWD of Riverside County - Retail

Cities of Perris, Hemet and San Jacinto.

Agencies Name	ID number
Eastern Municipal Water District - Retail	1004
Elsinore Valley MWD - Retail	6296
Lake Hemet Municipal Water District	7009
Nuevo Water Company	7011
Rancho California Water District	6986
Western MWD of Riverside County - Retail	1006

Materials meet state education framework requirements? Yes

All EMWD water education materials are in alignment with the CCS for the corresponding grade levels

Materials distributed to K-6? Yes

curriculum packets, which include journals, assessments, worksheets, and books. Also, include Water Fun, Water Times, Water Ways, and Admiral Splash.

Materials distributed to 7-12 students? Yes (Info Only)

Annual budget for school education program: 304621.00

Description of all other water supplier education programs

Presentations, assemblies, field trips, contests, Solar Cup, career days, health fairs, festivals, etc,

Comments:

At Least As effective As

No

Exemption

No

0



CUWCC BMP Retail Coverage Report 2014

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

1004 Eastern Municipal Water District - Retail

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:

Stacy Rodriguez

Title:

Conservation Programs Supervisor

Email:

rodriguezs@emwd.org

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.			Article 6 - Water Conservation Article 10 - Water Shortage Contingency Plan
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Retail Coverage Report 2014
Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

1004 Eastern Municipal Water District - Retail

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

EMWD AWWA WAS v5.0 FY13-14 - CUWCC.xls

AWWA Water Audit Validity Score? 82

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? Yes

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
537	8143230	973757	0	False	592427	

At Least As effective As

No

N/A

Exemption

No

Comments:

The Operational Efficiency fields won't save (AWWA WAS v5). Here are the fields requested:

*App Loss/conn/day: 4.04

*Real Loss/conn/day: 35.92

*Real Losses/main/day: N/A

*Real Loss/conn/day/psi: 0.48

*UURL: 3031.01

*CARL: 6333.55

*ILI: 2.09



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

1004 Eastern Municipal Water District - Retail

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	3454
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes
Date: 7/1/1997	
Uploaded file name:	
Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As

Yes

na

Exemption

No

Comments:

na



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

1004 Eastern Municipal Water District - Retail

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Commodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Allocation Based	Yes	61286945.25	16384622.02
Multi-Family	Allocation Based	Yes	6273799.15	1258537.33
Commercial	Uniform	Yes	6368908.65	1039343.19
Industrial	Uniform	Yes	958338.35	48763.31
Institutional	Uniform	Yes	3469442.45	578256.07
Dedicated Irrigation	Allocation Based	Yes	16327829.17	1182909.59
			94685263.02	20492431.51

Calculate: $V / (V + M)$

82 %

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes

Customer Class	Rate Type	Conserving Rate?
Single-Family	Increasing Block	Yes
Multi-Family	Increasing Block	Yes
Commercial	Uniform	Yes
Industrial	Uniform	Yes
Institutional	Uniform	Yes

At Least As effective As

Yes

See uploaded memo

Exemption

No

Comments:

EMWD allocated water rates have an indoor component that encourage the efficient use of water indoors. Since the implementation of allocation based water rate EMWD has seen a 4% reduction of wastewater treatment flows per person in entire district



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

1004 Eastern Municipal Water District - Retail

Retail

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Eastern Municipal Water District - Wholesale, Elsinore Valley MWD - Wholesale, Metropolitan Water District of SC, Western MWD of Riverside County - Wholesale
Riverside Public Utilities - Clay Monroe; Rancho California Water District - Meggan Valencia

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quarter of the reporting year? No

Public Outreach Program List	Number
Newsletter articles on conservation	13
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	1420000
Email Messages	35597
Landscape water conservation media campaigns	140000
General water conservation information	5000
Website	57633
Total	1658243

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	20
News releases	10
Newspaper contacts	200
Radio contacts	15
Television contacts	4
Online Advertisings	2
Total	251

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Total budget	1466325
Total Amount:	1466325



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Description of all other Public Outreach programs

Inland Empire Garden Friendly Plant Sales

Comments:

At Least As effective As

No

Exemption

No

0



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

1004 Eastern Municipal Water District - Retail

Retail

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Metropolitan Water District of SC

Materials meet state education framework requirements? Yes

All EMWD Water education materials are in alignment with the CCS for the corresponding grade levels and staff is currently working to align with common core curriculum standards.

Materials distributed to K-6? Yes

Curriculum packets, which include lesson plan, CD, plush character, journals, assessments, worksheets, and books. EMWD offers ten stories written and illustrated by students. Also include Water Fun, Water Times, Water Ways, Admiral Splash and more.

Materials distributed to 7-12 students? Yes (Info Only)

Conservation Connection, writing contest information, Solar Cup information.

Annual budget for school education program: 316903.00

Description of all other water supplier education programs

Presentations, assemblies, field trips, writing and art contests, Solar Cup, career days, health and science fairs, festivals. etc...

Comments:

At Least As effective As

No

Exemption

No

0



Flex Track Summary Report

Foundational Best Management Practices For Urban Water Efficiency

1004 Eastern Municipal Water District - Retail

BMP	ACTUAL	TARGET	PRIOR CREDIT	Coverage option	STATUS
BMP 3	174.54	614.02	5097.390	Flextrack	ON TRACK
BMP 4	56.95	430.22	216.120	Flextrack	
BMP 5	1871.36	1228.09	3874.88	Flextrack	ON TRACK
TOTAL	1459.58	2272.33	9188.39		On Track



CUWCC BMP Wholesale Coverage Report 2014

Foundational Best Management Practices for Urban Water Efficiency

BMP 1.1 Wholesale Agency Assistance Programs

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Name: Stacy Rodriguez Email: rodriguezs@emwd.org

a) Financial Investments and Building Partnerships

BMP Section	Monetary Amount for Financial Incentives	Monetary Amount for Equivalent Resources	
BMP 2.1 Public Outreach	1466325		
BMP 2.2 School Education Program	315094		

b) Technical Support

c) Retail Agency

d) Water Shortage Allocation

Adoption Date: 4/1/2009

File Name:

e) Non signatory Reporting of BMP implementation by non-signatory Agencies

Eastern has no non-Signatory Reporting for its sub-agencies. Our sub-agencies are relatively small with limited staff.

f) Encourage CUWCC Membership List Efforts to Recruit Retailers

We have quarterly meetings with our sub-agencies in which we have discussed BMP Reporting. We offered assistance in completing those reports and communicated the benefits of becoming a signatory.

At Least As effective As

No

We do have public education & marketing outreach that is provided to all of our sub-agencies.

Exemption

No

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Completed Standard Water Audit Using AWWA Software? Yes

AWWA File provided to CUWCC? Yes

Copy_of_EMWD_FY14-15_WAS.xls

AWWA Water Audit Validity Score?

Complete Training in AWWA Audit Method Yes

Complete Training in Component Analysis Process? Yes

Component Analysis? Yes

Repaired all leaks and breaks to the extent cost effective? Yes

Locate and Repair unreported leaks to the extent cost effective? Yes

Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair. Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
537	8143230	973757		True	594427	

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Numbered Unmetered Accounts No

Metered Accounts billed by volume of use Yes

Number of CII Accounts with Mixed Use Meters

Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? No

Feasibility Study provided to CUWCC? No

Date:

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters Yes

At Least As effective As

No

Exemption

No

Comments:



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Wholesale

Does your agency perform Public Outreach programs? Yes

The list of retail agencies your agency assists with public outreach

City of Perris, Eastern Municipal Water District - Retail, Lake Hemet Municipal Water District, Nuevo Water Company, Rancho California Water District, Western MWD of Riverside County - Retail

Riverside Public Utilities - Clay Monroe, City of Hemet -

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quarter of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	13
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	1420000
Website	57633
Landscape water conservation media campaigns	140000
General water conservation information	5000
Email Messages	35597
Total	1658243

Did at least one contact take place during each quarter of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	20
News releases	10
Newspaper contacts	200
Radio contacts	15
Television contacts	4
Online Advertisings	2
Total	251

Did at least one website update take place during each quarter of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Outreach Expenses	1466325
Total Amount:	1466325



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

Description of all other Public Outreach programs

Inland Empire Garden Friendly Plant SalesWRCOG Energy & Water Conservation Program Promotion

Comments:

At Least As effective As

No

Exemption

No

0



CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

2004 Eastern Municipal Water District - Wholesale

Wholesale

Does your agency implement School Education programs? Yes

The list of retail agencies your agency assists with public outreach

Eastern Municipal Water District - Retail, Elsinore Valley MWD - Retail, Lake Hemet Municipal Water District, Nuevo Water Company, Rancho California Water District, Western MWD of Riverside County - Retail

Cities of Perris, Hemet and San Jacinto.

Materials meet state education framework requirements? Yes

All EMWD water education materials are in alignment with the CCS for the corresponding grade levels and staff is currently working to align with common core curriculum

Materials distributed to K-6? Yes

curriculum packets, which include journals, assessments, worksheets, and books. Also, include Water Fun, Water Times, Water Ways, and Admiral Splash.

Materials distributed to 7-12 students? Yes (Info Only)

Conservation Connection, writing contest information, solar Cup information

Annual budget for school education program:

316903.00

Description of all other water supplier education programs

Presentations, assemblies, field trips, contests, Solar Cup, career days, health fairs, festivals, etc,

Comments:

At Least As effective As

No

Exemption

No

0

Appendix K - Notice of Public Hearing

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How terrible milestones remind us of work we do

Six months ago this week, terror, tragedy and ensuing sorrow cast an emotionally wrenching darkness over San Bernardino, our neighbor to the east.

Families were broken. Our sense of safety was shattered. Scores were

killed and injured on a day that began like any other workday.

That's when two individuals (I don't need to mention their names in this column) walked into the Inland Regional Center in San Bernardino with guns. They

shot and killed 14 and injured 22.

Many of the stories we wrote, including in today's Press-Enterprise, document what took place that afternoon: the aftermath, the grief and suffering. You can read all of those stories, and you should. They are reminders – a curated history of San Bernardino on that fateful day so that all will remember. Our thoughts and prayers go out to those affected.

In this column, however, I want to take it a step further as we reach the six-month mark of the shootings and remind our readers of our commitment – the commitment of not just journalists here at The P-E but those at The Sun in San Bernardino, the Inland Valley Daily Bulletin, the Orange County Register, the Redlands Daily Facts – and the entirety of



MICHAEL CORONADO
ASK THE EDITOR

the newsgathering organizations that collectively make up the Southern California News Group – it's a commitment to building great local journalism that matters in your life.

On that Dec. 2 day, dozens of journalists from all of those news organizations dispatched to the scene to bring the immediacy of what was unfolding. Online reports, photo galleries, analysis. Local journalism that mattered around the clock. In fact, The P-E and The Sun were awarded the top awards for deadline reporting in the country among all newspapers in their circulation by the Society of Professional Journalists. No small feat.

Naysayers of current news coverage like to think local journalism is a thing that has come and gone.

They pine for the “good ol’ days.”

These are not the good ol’ days. These are the great days of journalism. These are the extraordinary days of journalism, the transformative days, where our reporters and photographers and newsgatherers can instantly take you to a political rally and protest via tools such as twitter and Facebook. Where photographers can upload video and images in real time of unfolding events during a terrorist attack.

Where writers and data journalists can explain the intricacies of stories such as the current Beaumont corruption case digitally in ways never done before. And we focus that effort in print, too. Those reports and stories were packaged into a comprehensive print newspaper that dove deeper into the Beaumont case than any other news organization in the country. We

even increased the number of pages on those days to get in all of the coverage.

That's local journalism that matters. Right here. Right now. No one else is going to devote the resources, staffing, legal expense and commitment to stories such as the Beaumont case. It's expensive and exhaustive, but it's vital to our community and that's our daily commitment to building great journalism every day.

A milestone such as the San Bernardino terrorist attack reminds us as journalists why we do what we do each day. Though our resources and staffing levels are much smaller than in years past, our commitment remains steadfast.

As always, if you have a question about how we report the news or write our stories or about something happening in your community, please drop me a line at mcoronado@pe.com.

Have a nice Sunday.

THE PRESS-ENTERPRISE

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COLLEGE

FROM PAGE 1

ditional shovels in the ground and earth being moved.”

The district's main campus in San Jacinto and outlying Menifee Valley and San Gorgonio Pass campuses are earmarked for major building projects, and money also would be available for its Temecula Education Complex and Temecula Higher Education Center.

New campuses are envisioned in Wildomar and farther south on the I-15 corridor.

The extensive project list is designed to meet the needs of an agency whose 1,700-square-mile jurisdiction is nearly as large geographically as the state of Delaware. The 53-year-old district encompasses 11 cities and numerous towns, from Temecula to Banning and from Lake Elsinore to Idyllwild.

“We have one of the fastest-growing community

Mt. San Jacinto Community College Measure AA

- Projected bond-funded spending, plus possible state contributions.
- 1

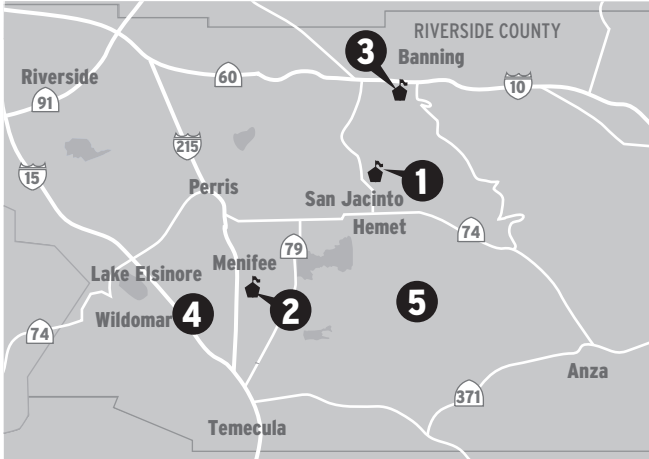
Mt. San Jacinto campus
\$231.4 million
- 2

Menifee Valley campus
\$146.4 million
- 3

San Gorgonia Pass campus
\$44.6 million
- 4

I-15 Corridor: Future Wildomar and Temecula area campuses
\$94.8 million
- 5

Districtwide Projects
\$79 million



STAFF GRAPHIC

college districts in the state of California,” said Banning resident Bob Botts, chairman of the citizens committee overseeing bond spending. “To continue to offer the course offerings that we need, we’ve just got to build these buildings. With this expansion, we’ll increase the capability of the college tremendously on all campuses.”

Prominent on the project list in San Jacinto are the construction of cultural arts, student services and fitness centers, plus a science and technology

building and library.

Probably the first project students and faculty will see spring up from the ground will be a 1-megawatt solar power system that will be built on 5 vacant acres in the campus’ northeast corner.

“Our hope is to have that functioning by Dec. 31 of this year,” Schultz said. “That would cover most of the Mt. San Jacinto campus energy needs.”

Projects identified on the Menifee Valley campus include a math and science building, health building, student services and performing arts centers and a football stadium.

The San Gorgonio Pass campus now served by portable modular structures would be enlarged with permanent buildings.

In addition to addressing existing sites, the district has tagged nearly \$95 million for the establishment of a science, technology and math campus on 80 acres in Wildomar. The district has an agreement to buy the property from the county, a deal challenged by a lawsuit. Though the plaintiffs lost in trial court, they filed an appeal and the suit is pending appellate court review. Meanwhile, environmental analysis of the vacant property is proceeding.

“We’re at about the midpoint of that environmental impact study,” said Vice President of Business Services Becky Elam. “We believe we’ll have that ready in January 2017. That’s going to move forward independent of the appeal.”

Though the district already has the two sites in Temecula, administrators want to develop a full-fledged campus in the district’s southwestern corner along the I-15 corridor.

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Captain America: Civil War (PG-13) Fri. - Mon. 8:50 10:35 12:20 2:05 3:45 5:35 7:25 9:15 10:55; Tue. & Wed. 10:35 12:20 2:05 3:45 5:35 7:25 9:15 10:55; Thu. 10:35 12:20

The Nice Guys (R) No Passes Fri. - Mon. 10:10 1:05 4:05 6:55 9:55; Tue. & Wed. 10:40 1:35 4:25 7:10 9:55; Thu. 10:40 1:35

X-Men: Apocalypse (PG-13) No Passes Fri. - Mon. 8:30 9:00 10:25 11:00 11:30 12:00 2:00 2:30 3:00 3:30 5:30 6:15 6:45 7:15 8:30 9:00 9:45 10:15 10:45; Tue. & Wed. 10:40 11:00 11:30 12:00 2:00 2:30 3:00 3:30 5:30 6:15 6:45 7:15 8:30 9:00 9:45 10:15 10:45; Thu. 10:40 11:00 11:30 12:00

Alice Through the Looking Glass (PG) No Passes Fri. - Mon. 8:35 9:30 10:00 10:30 12:15 12:35 1:00 1:30 3:05 3:40 4:00 4:30 5:45 6:30 7:00 7:30 9:30 10:00 10:30; Tue. & Wed. 10:30 12:15 12:35 1:15 1:40 3:05 3:40 4:00 4:30 5:45 6:30 7:00 7:30 9:30 10:00 10:30; Thu. 10:30 12:15 12:35 1:15

X-Men: Apocalypse 3D (PG-13) No Passes Fri. - Mon. 11:00 1:15; Tue. & Wed. 11:00 1:45

Alice Through the Looking Glass 3D (PG) No Passes Fri. - Mon. 10:15 5:00 8:00; Tue. & Wed. 10:50 5:00 8:00; Thu. 10:50

Neighbors 2: Sorority Rising (R) No Passes Fri. - Mon. 9:40 10:05 12:10 12:40 2:35 3:10 4:55 5:40 7:20 8:05 9:50 10:40; Tue. & Wed. 10:40 12:55 3:10 5:40 8:05 10:40; Thu. 10:40 12:10 12:55 3:35 3:10 4:55 5:40 7:20 8:05 9:50 10:40; Thu. 10:40 12:10 12:55


Teenage Mutant Ninja Turtles: Out of the Shadows (PG-13) No Passes Thu. 5:00 5:30 7:00 8:05 8:35 10:05

The Angry Birds Movie (PG) No Passes Fri. - Mon. 9:35 9:50 12:05 12:50 2:50 3:25 5:25 6:05 7:55 8:35 10:35; Tue. & Wed. 10:35 12:05 12:50 2:50 3:25 5:25 6:05 7:55 8:35 10:35; Thu. 10:35 12:05 12:50

Money Monster (R) Fri. - Mon. 10:20 1:10 3:50 6:50 9:35; Tue. & Wed. 10:50 1:20 3:50 6:50 9:35; Thu. 10:50 1:20

The Jungle Book (PG) Fri. - Mon. 10:40 1:25 3:55 6:40 9:25; Tue. & Wed. 10:55 1:25 3:55 6:40 9:25; Thu. 10:55 1:25

Teenage Mutant Ninja Turtles: Out of the Shadows 3D (PG-13) No Passes Thu. 6:00 9:00



emwd EASTERN MUNICIPAL WATER DISTRICT

NOTICE OF PUBLIC HEARING TO ADOPT THE 2015 URBAN WATER MANAGEMENT PLAN AND THE COMPLIANCE REPORT ON THE REQUIREMENTS OF THE WATER CONSERVATION ACT OF 2009

The Eastern Municipal Water District (EMWD) has prepared a Draft 2015 Urban Water Management Plan (UWMP) in compliance with the requirements established by the Urban Water Management Planning Act (California Water Code Division 6, Part 2.6, §10610 – 10656). In addition, the Water Conservation Act of 2009 requires that every UWMP include: baseline per capita water use data, urban water use target, interim urban water use targets and a compliance report on the identified targets. This information is included in the Draft 2015 UWMP.

This Public Notice officially notifies the general public that the Draft UWMP is available for public review at District headquarters or on EMWD's website at www.emwd.org. Email or written comments on the Draft UWMP or requests for more information should be sent to:

Eastern Municipal Water District
Attention: Gordon Ng
ngg@emwd.org
P.O. Box 8300
Perris, CA 92572-8300

Public input is encouraged. Email or written comments are due by June 15, 2016 and will be considered during finalization of the 2015 UWMP.

A public hearing of the EMWD Board of Directors to take action and allow community input on the 2015 UWMP and EMWD's progress on the requirements of the Water Conservation Act of 2009 will be held at 9:00 am on June 15, 2016 at the EMWD headquarters:

Eastern Municipal Water District
2270 Trumble Road
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X-MEN: APOCALYPSE PG-13 (11:30, 12:50, 4:00, 6:00, 7:20, 10:40)
X-MEN: APOCALYPSE 3D PG-13 (2:40, 9:20)
THE ANGRY BIRDS MOVIE PG Fr. (12:20, 2:50, 4:10, 5:30, 6:50, 8:10, 9:30; Sat & Sun. (11:10, 12:20, 1:30, 2:50, 4:10, 5:30, 6:50, 8:10, 9:30)
NEIGHBORS 2: SORORITY RISING R (12:00, 2:20, 5:10, 7:40, 10:00)
THE NICE GUYS R (11:40, 2:30, 5:15, 7:55, 10:25)
CAPTAIN AMERICA: CIVIL WAR PG-13 (12:10, 3:35, 6:50, 10:05)
THE JUNGLE BOOK PG (11:00, 1:40, 4:20, 7:10, 9:40)

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ALICE THROUGH THE LOOKING GLASS PG (11:20, 12:40, 2:00, 3:15, 4:45, 6:00, 7:30, 8:45, 10:10)
X-MEN: APOCALYPSE PG-13 (11:05, 12:20, 3:45, 5:25, 7:20, 10:25)
X-MEN: APOCALYPSE 3D PG-13 (2:10, 8:30)
THE ANGRY BIRDS MOVIE PG Fr. (11:15, 12:30, 4:50, 7:10, 10:30)
THE BOSS R (12:35, 3:00, 5:20, 8:00, 10:20)
NEIGHBORS 2: SORORITY RISING R (12:00, 2:20, 5:10, 7:40, 10:00)
THE NICE GUYS R (11:40, 2:30, 5:15, 7:55, 10:25)
CAPTAIN AMERICA: CIVIL WAR PG-13 (12:10, 3:35, 6:50, 10:05)
THE JUNGLE BOOK PG (11:00, 1:40, 4:20, 7:10, 9:40)

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THE HUNTSMAN: WINTER'S WAR PG-13 Fr. (1:50, 4:30, 7:10, 10:00; Sat & Sun. (11:15, 1:50, 4:30, 7:10, 10:00)
THE BOSS R (12:35, 3:00, 5:20, 8:00, 10:20)
BATMAN V SUPERMAN: DAWN OF JUSTICE PG-13 (12:30, 3:45, 7:00, 10:15)
BATMAN V SUPERMAN: DAWN OF JUSTICE 3D PG-13 Fr. (2:45, 6:00, 9:15; Sat & Sun. (11:25, 2:45, 6:00, 9:15)
MY BIG FAT GREEK WEDDING 2 PG-13 (12:20, 2:35, 5:05, 7:35, 9:50)
MIRACLES FROM HEAVEN PG Fr. (2:20, 4:55, 7:25, 9:55; Sat & Sun. (11:45, 2:20, 4:55, 7:25, 9:55)
10 CLOVERFIELD LANE PG-13 (12:15, 5:10)
DEADPOOL R (2:40, 7:40, 10:10)
KUNG FU PANDA 3 PG Fr. (1:55, 4:15, 6:40, 9:05; Sat & Sun. (11:30, 1:55, 4:15, 6:40, 9:05)

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CONTACT THE WRITER:
951-368-9690 or
michaelwilliams@pe.com

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Appendix L - Resolution for Adoption of the 2015 UWMP

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RESOLUTION NO. 2016-074

**A RESOLUTION OF THE BOARD OF DIRECTORS OF EASTERN
MUNICIPAL WATER DISTRICT ADOPTING THE 2015 URBAN
WATER MANAGEMENT PLAN**

WHEREAS, Eastern Municipal Water District (the "District") is an urban water supplier with 147,300 connections and the California Urban Water Management Planning act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the California Urban Water Management Planning Act specifies the requirements and procedures for adopting such Urban Water Management Plans; and

WHEREAS, the Board of Directors has duly reviewed, discussed, and considered such Urban Water Management Plan and has determined the 2015 Urban Water Management Plan to be consistent with the California Urban Water Management Planning Act and to be an accurate representation of the water resources plan for the District.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF EASTERN MUNICIPAL WATER DISTRICT DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

1. On June 15, 2016, this District hereby adopts this 2015 Urban Water Management Plan for submittal to the State of California.
2. This Resolution shall be effective upon its adoption.

DATED: June 15, 2016



Randy A. Record, President

I hereby certify that the foregoing is a full, true and correct copy of the Resolution adopted by the Board of Directors of the Eastern Municipal Water District at its meeting held on June 15, 2016.

ATTEST:



Tami Martinez, Deputy Board Secretary

(SEAL)