2015

URBAN WATER MANAGEMENT PLAN

FINAL

MAY 2016

2015 URBAN WATER MANAGEMENT PLAN

El Toro Water District

FINAL

Sarina Sriboonlue, P.E.

Staff Environmental Engineer

Prepared for:

Dennis Cafferty

District Engineer

El Toro Water District

24251 Aliso Boulevard

Lake Forest, CA 92630

Prepared by:

Arcadis U.S., Inc.

445 South Figueroa Street

Suite 3650

Los Angeles

California 90071

Tel 213 486 9884

Fax 213 486 9894

Our Ref.:

4109039.0000

Date:

May 2016

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

20x2020	20% Water Use Reduction in GPCD by Year 2020
Act	Urban Water Management Planning Act
ACTM	Aufdenkamp Connection Transmission Main
AF	Acre-Feet
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
AMP	Allen-McColloch Pipeline
AMR	Automatic Meter Reading
AWWA	American Water Works Association
Biops	Biological Opinions
BMP	Best Management Practice
CCC	California Coastal Commission
CDR	Center for Demographic Research
CFS	Cubic Feet per Second
CII	Commercial/Industrial/Institutional
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
Delta	Sacramento-San Joaquin River Delta
District	El Toro Water District
DMM	Demand Management Measure
DOF	Department of Finance
DVL	Diamond Valley Lake
DWR	Department of Water Resources
EIR	Environmental Impact Report
FY	Fiscal Year
GPCD	Gallons per Capita per Day
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
IPR	Indirect Potable Reuse
IRP	Integrated Resource Plan
IRWD	Irvine Ranch Water District
IWA	International Water Association
JRWSS	Joint Regional Water Supply System
LBCWD	Laguna Beach County Water District
LRP	Local Resources Program
LTFP	Long-Term Facilities Plan
MAF	Million Acre-Feet
Metropolitan	Metropolitan Water District of Southern California

MNWD	Moulton Niguel Water District
MGD	Million Gallons per Day
MHI	Median Household Income
MWDOC	Municipal Water District of Orange County
NDMA	N-nitrosodimethylamine
OC	Orange County
OCWD	Orange County Water District
Poseidon	Poseidon Resources LLC
PPCP	Personal Care Product
RHNA	Regional Housing Needs Assessment
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCWD	South Coast Water District
SDCWA	San Diego County Water Authority
SDP	Seawater Desalination Program
SMWD	Santa Margarita Water District
SOCWA	South Orange County Wastewater Authority
Study	Colorado River Basin Water Supply and Demand Study
SWP	State Water Project
SWRCB	California State Water Resources Control Board
TCWD	Trabuco Canyon Water District
TDS	Total Dissolved Solids
UWMP	Urban Water Management Plan
WBIC	Weather Based Irrigation Controller
WEROC	Water Emergency Response Organization of Orange County
WRP	Water Recycling Plant
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management

1 INTRODUCTION

1.1 Urban Water Management Plan Requirements

Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act) require every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare, adopt, and file an Urban Water Management Plan (UWMP) with the California Department of Water Resources (DWR) every five years in the years ending in zero and five. The 2015 UWMP updates are due to DWR by July 1, 2016.

This UWMP provides DWR with a detailed summary of present and future water resources and demands within the El Toro Water District's (District) service area and assesses the District's water resource needs. Specifically, the UWMP provides water supply planning for a 25-year planning period in five-year increments and identifies water supplies needed to meet existing and future demands. The demand analysis must identify supply reliability under three hydrologic conditions: a normal year, a single-dry year, and multiple-dry years. The District's 2015 UWMP updates the 2010 UWMP in compliance with the requirements of the Act as amended in 2009, and includes a discussion of:

- Water Service Area and Facilities
- Water Sources and Supplies
- Water Use by Customer Type
- Demand Management Measures
- Water Supply Reliability
- Planned Water Supply Projects and Programs
- Water Shortage Contingency Plan
- Recycled Water Use

Since the original Act's passage in 1983, several amendments have been added. The most recent changes affecting the 2015 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. SBx7-7, or the Water Conservation Act of 2009, is part of the Delta Action Plan that stemmed from the Governor's goal to achieve a 20 percent statewide reduction in urban per capita water use by 2020 (20x2020). Reduction in water use is an important part of this plan that aims to sustainably manage the Bay Delta and reduce conflicts between environmental conservation and water supply; it is detailed in Section 3.2.2. SBx7-7 requires each urban retail water supplier to develop urban water use targets to achieve the 20x2020 goal and the interim ten percent goal by 2015. Each urban retail water supplier must include in its 2015 UWMPs the following information from its target-setting process:

- Baseline daily per capita water use
- 2020 Urban water use target
- 2015 Interim water use target compliance

- Compliance method being used along with calculation method and support data
- An implementation plan to meet the targets

The other recent amendment, made to the UWMP on September 19, 2014, is set forth by SB 1420, Distribution System Water Losses. SB 1420 requires water purveyors to quantify distribution system losses for the most recent 12-month period available. The water loss quantification is based on the water system balance methodology developed by the American Water Works Association (AWWA).

The sections in this UWMP correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the District's water utility. The UWMP Checklist has been completed, which identifies the location of Act requirements in this Plan and is included in Appendix A. This is an individual UWMP for a retail agency, as shown in Tables 1-1 and 1-2. Table 1-2 also indicates the units that will be used throughout this document.

Table 1-1: Plan Identification

Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance**
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Table 1-2: Agency Identification

Agency Identification	
Type of Agency	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year	
☐	UWMP Tables Are in Calendar Years
☑	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
7/1	
Units of Measure Used in UWMP	
Unit	AF
NOTES:	

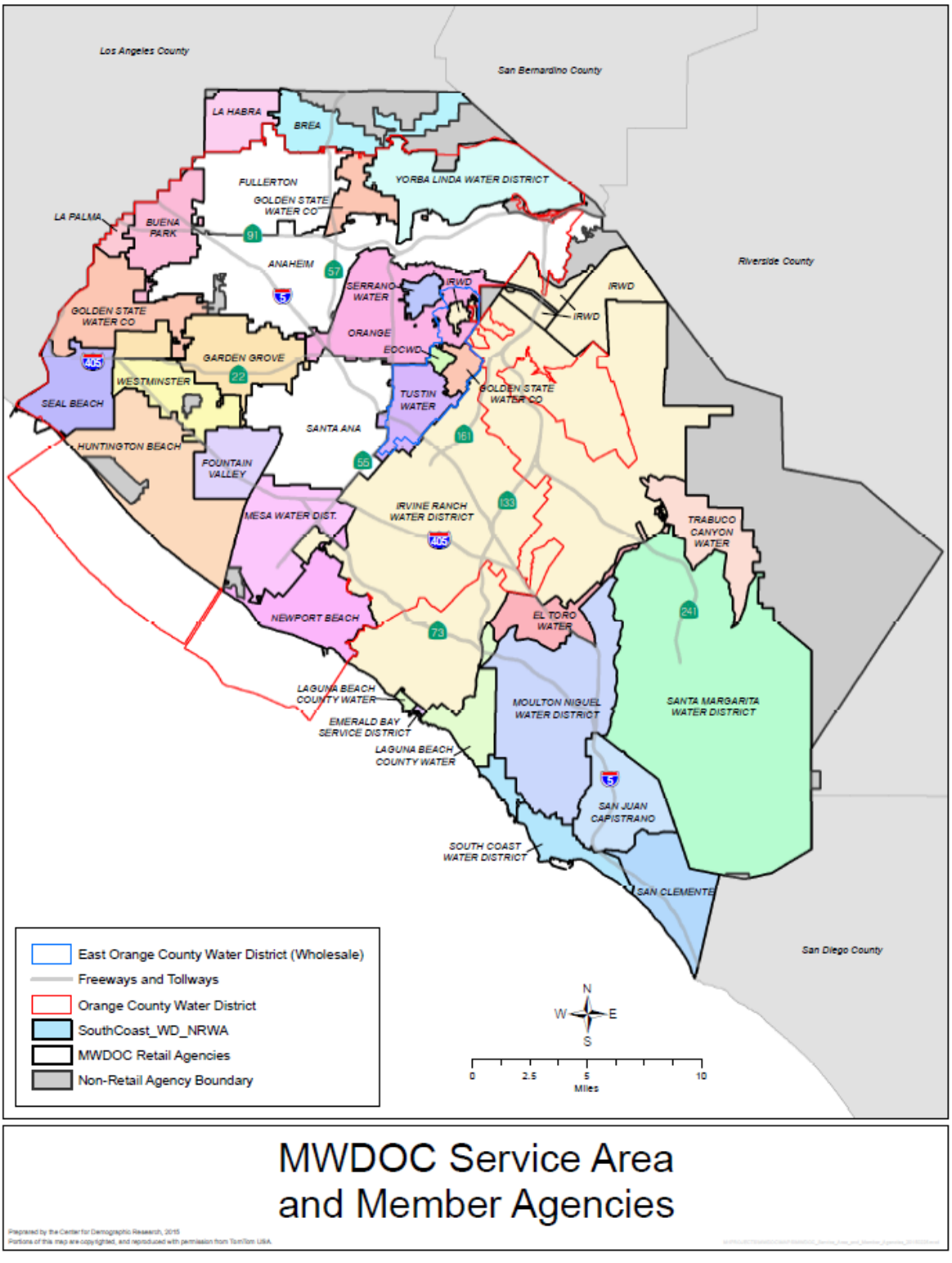
1.2 Agency Overview

The District, located within the southern portion of the County of Orange, was formed in 1960 under provisions of California Water District Law, Division 13 of the Water Code of the State of California, commencing with Section 34000 for the purpose of providing water supply for the service area. The District is governed by a publicly elected five-member Board of Directors. The current board members are:

- M. Scott Goldman, President
- William H. Kahn, Vice President
- Jose Vergara, Treasurer
- Frederick J. Adjarian, Director
- Mark Monin, Director

The District receives its water from two main sources, recycled water, and imported water from the Municipal Water District of Orange County (MWDOC). MWDOC is Orange County's wholesale supplier and is a member agency of the Metropolitan Water District of Southern California (Metropolitan).

The regional location of the District is shown on Figure 1-1.



MWDOC Service Area and Member Agencies

Figure 1-1: Regional Location of Urban Water Supplier

1.3 Service Area and Facilities

1.3.1 El Toro Water District Service Area

The District encompasses approximately 5,350 acres and in 2015 provided water and sewer service to over 48,000 customers. The District is almost entirely developed and encompasses all of the City of Laguna Woods and portions of four other cities: Lake Forest, Aliso Viejo, Laguna Hills and Mission Viejo. The District Service Area Map may be found on Figure 1-2.

The District service area ranges in elevation between 230 feet above sea level at its lowest point to 904 feet at its highest. In general, elevations increase from west to east. Interstate 5 bisects the District from north to south, with the higher elevations located on the east side. The District is bordered by the Irvine Ranch Water District (IRWD) to the north, the Laguna Beach County Water District (LBCWD) to the west, the Moulton Niguel Water District (MNWD) to the west and south, and the Santa Margarita Water District (SMWD) to the south and east. The District also shares a small border with the Trabuco Canyon Water District (TCWD) in the north.

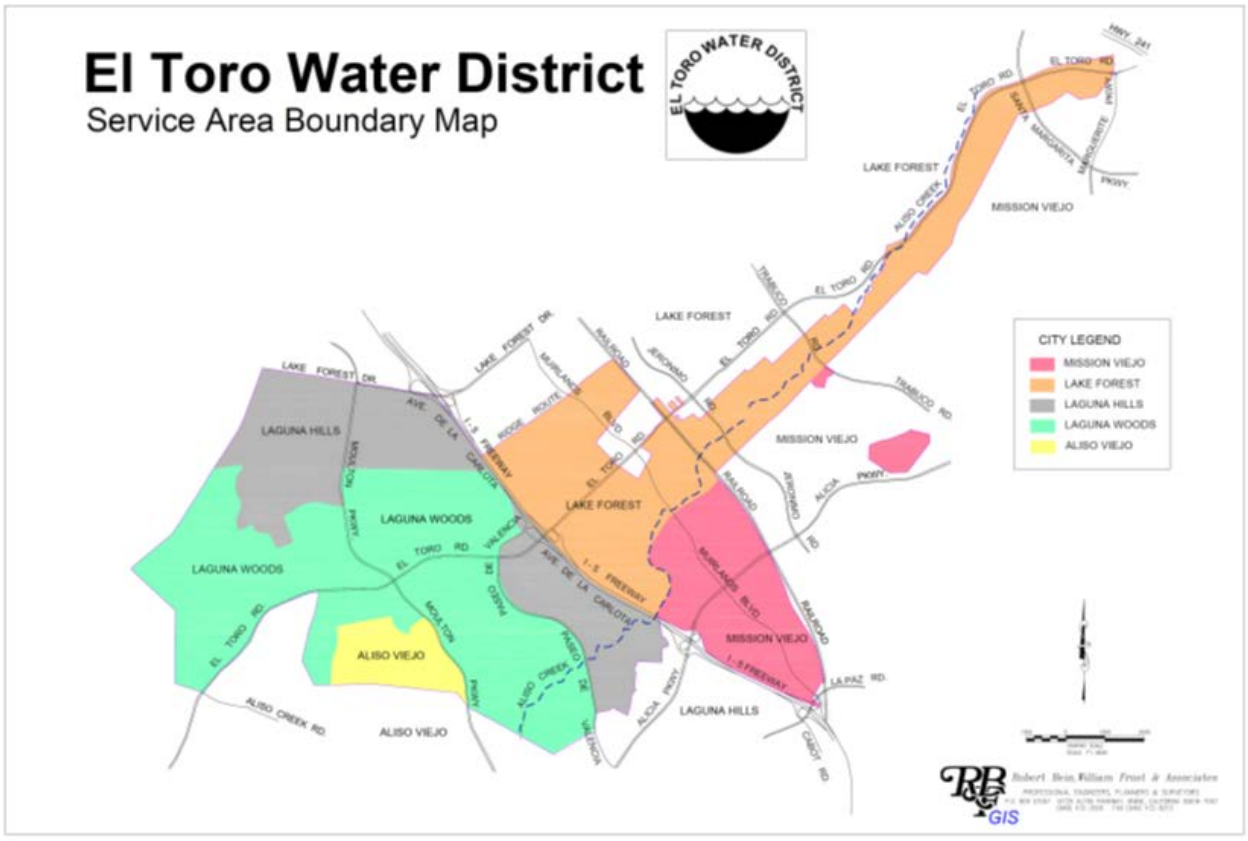


Figure 1-2: El Toro Water District Service Area

1.3.2 El Toro Water District Facilities

The District relies on imported treated water from the Metropolitan transmission system to meet all of its demands. In general, imported water from Metropolitan fills the District's 275.0 million gallon R-6 reservoir or directly feeds the distribution system. Water from Metropolitan and/or the R-6 reservoir is fed by gravity, through pressure reducing valves or via pumping stations to provide adequate system pressures at the District's service connections. The District operates and maintains a system that has approximately 9,818 service connections, 12 different pressure zones, 6 reservoirs, 8 pump stations, 19 pressure reducing stations and approximately 170 miles of transmission and distribution pipelines of varying diameters between four inches and 24 inches.

The system connections and water volume supplied are summarized in Table 1-3, and the wholesalers informed of this water use as required are displayed in Table 1-4.

Table 1-3: Public Water Systems

Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3010079	El Toro Water District	9,818	9,145
	TOTAL	9,818	9,145
NOTES:			

Table 1-4: Water Supplier Information Exchange

Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
MWDOC
NOTES:

2 DEMANDS

2.1 Overview

Since the last UWMP update, southern California's urban water demand has been largely shaped by the efforts to comply with SBx7-7. This law requires all California retail urban water suppliers serving more than 3,000 acre-feet per year (AFY) or 3,000 service connections to achieve a 20 percent water demand reduction (from a historical baseline) by 2020. The District has been actively engaged in efforts to reduce water use in its service area to meet the 2015 interim 10 percent reduction and the 2020 final water use target. Meeting this target is critical to ensure the District's eligibility to receive future state water grants and loans.

In April 2015 Governor Brown issued an Emergency Drought Mandate as a result of one of the most severe droughts in California's history, requiring a collective reduction in statewide urban water use of 25 percent by February 2016, with each agency in the state given a specific reduction target by DWR. In response to the Governor's mandate, the District is carrying out more aggressive conservation efforts. It is also implementing higher (more restrictive) stages of its water conservation ordinance in order to achieve its demand reduction target of 24 percent set for the District itself and the Regional Alliance of all participating MWDOC utility agencies (discussed later in Section 2.5).

In addition to local water conservation ordinances, the District has engaged in activities that range from being a signatory member of the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMP) Memorandum of Understanding since 2000 to ongoing water audit and leak detection programs. The District has also partnered with MWDOC on educational programs, indoor retrofits and training.

These efforts have been part of statewide water conservation ordinances that require watering landscape watering, serving water in restaurants and bars, and reducing the amount of laundry cleaned by hotels. Further discussion on the District's water conservation ordinance is covered in Section 5 Water Supplies Contingency Plan.

This section analyzes the District's current water demands by customer type, factors that influence those demands, and projections of future water demands for the next 20 years. In addition, to satisfy SBx7-7 requirements, this section provides details of the District's SBx7-7 compliance method selection, baseline water use calculation, and 2015 and 2020 water use targets.

2.2 Factors Affecting Demand

Water demands within the District's service area are dependent on many factors such as local climate conditions and the evolving hydrology of the region, demographics, land use characteristics, and economics. In addition to local factors, southern California's imported water sources are also experiencing drought conditions that impact availability of current and future water supplies.

2.2.1 Climate Characteristics

The District is located within the South Coast Air Basin (SCAB) that encompasses all of Orange County, and the urban areas of Los Angeles, San Bernardino, and Riverside counties. The SCAB climate is characterized by southern California's "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall.

Local rainfall has limited impacts on reducing demand for the District. Water that infiltrates into the soil may enter groundwater supplies depending on the local geography. However, due to the large extent of impervious cover in southern California, rainfall runoff quickly flows to a system of concrete storm drains and channels that lead directly to the ocean.

Metropolitan's water supplies come from the State Water Project (SWP) and the Colorado River Aqueduct (CRA), influenced by climate conditions in northern California and the Colorado River Basin, respectively. Both regions have been suffering from multi-year drought conditions with record low precipitation which directly impact water supplies to southern California.

2.2.2 Demographics

The District has a 2015 population of 48,797 according to the California State University at Fullerton's Center of Demographics Research (CDR). The District is almost completely built-out, and its population is projected to increase 9 percent by 2040, representing an average growth rate of 0.36 percent per year. The District's service area includes residential, commercial and institutional customers within portions of the Cities of Aliso Viejo, Mission Viejo, Laguna Hills, Lake Forest and all of Laguna Woods.

Projected growth has decreased slightly since the 2010 UWMP, there are still parcels within the District's service area that are vacant or have re-development potential. Table 2-1 shows the population projections in five-year increments out to 2040 within the District's service area.

Table 2-1: Population – Current and Projected

Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
	48,797	52,743	52,750	53,225	53,245	53,196
NOTES: Center for Demographic Research, California State University, Fullerton 2015						

2.2.3 Land Use

The District's service area can best be described as a predominately single and multi-family residential community located along the coast in southern Orange County. There are areas of industrial and institutional uses along with golf courses and large dedicated landscape. The City of Laguna Hills has approved re-development of the Laguna Hills Mall. Improvements will be made to the existing facility with the addition of 1,000 new apartments to the site.

2.3 Water Use by Customer Type

An agency's water consumption can be projected by understanding the type of use and customer type creating the demand. Developing local water use profiles helps to identify quantity of water used, and by whom within the agency's service area. A comprehensive profile of the agency's service area enables the impacts of water conservation efforts to be assessed and to project the future benefit of water conservation programs.

The following sections of this UWMP provide an overview of the District's water consumption by customer account type as follows:

- Single-family Residential
- Multi-family Residential
- Commercial
- Institutional/ Government

Other water uses including sales to other agencies and non-revenue water are also discussed in this section.

2.3.1 Overview

There are 9,818 current customer active service connections in the District's water distribution system with all existing connections metered. Approximately 59 percent of the District's water demand is residential; institutional, governmental, industrial and dedicated landscape make up the remaining portion of demand.

Table 2-2 contains a summary of the District's total water demand in fiscal year (FY) 2014-15 for potable water volumes.

Table 2-2: Demands for Potable and Raw Water - Actual (AF)

Retail: Demands for Potable and Raw Water - Actual		
Use Type	2015 Actual	
	Level of Treatment When Delivered	Volume
Single Family	Drinking Water	2,139
Multi-Family	Drinking Water	2,973
Institutional/Governmental	Drinking Water	57
Industrial	Drinking Water	1,021
Landscape	Drinking Water	2,234
Losses	Drinking Water	225
TOTAL		8,649
NOTES: Data retrieved from ETWD's billing records.		

2.3.2 Non-Residential

Non-residential use includes industrial and dedicated landscape water demands. Industrial water use accounts for 12 percent of total water demands and dedicated landscape accounts for 26 percent of total water demand. Institutional/governmental water demand makes up one percent of overall demand. The District has a mix of commercial uses (markets, restaurants, etc.), public entities (schools, fire stations and government offices), office complexes, light industrial and warehouses.

2.3.3 Sales to Other Agencies

The District does not sell water to other agencies except in the case of emergencies.

2.3.4 Non-Revenue Water

Non-revenue water is defined by the International Water Association (IWA) as the difference between distribution systems input volume (i.e. production) and billed authorized consumption. Non-revenue water consists of three components: unbilled authorized consumption (e.g. hydrant flushing, firefighting, and blow-off water from well start-ups), real losses (e.g. leakage in mains and service lines), and apparent losses (unauthorized consumption and metering inaccuracies).

A water loss audit was conducted per AWWA methodology for the District to understand the relation between water loss and revenue losses. This audit was developed by the IWA Water Loss Task Force as a universal methodology that could be applied to any water distribution system. This audit meets the requirements of SB 1420 that was signed into law in September 2014. Understanding and controlling water loss from a distribution system is an effective way for the District to achieve regulatory standards and manage their existing resources.

Table 2-3 below is a result of the AWWA Water Audit completed for the District and the 2015 UWMP. The water loss summary was calculated over a one-year period from available data and the methodology explained above. The volume of water loss calculated for this period represents 5.1 percent of the District's annual water supplied, this presents an opportunity to identify areas of high water loss and develop strategies to minimize it.

Table 2-3: Water Loss Audit Summary

Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
01/2015	376
NOTES:	

2.4 Demand Projections

Demand projections were developed by MWDOC for each agency within their service area based on available data as well as land use, population and economic growth. Three trajectories were developed representing three levels of conservation: 1) continued with existing levels of conservation (lowest conservation), 2) addition of future passive measures and active measures (baseline conservation), and

3) aggressive turf removal program - 20 percent removal by 2040 (aggressive conservation). The baseline demand projection was selected for the 2015 UWMP. The baseline scenario assumes the implementation of future passive measures affecting new developments, including the Model Water Efficient Landscape, plumbing code efficiencies for toilets, and expected plumbing code for high-efficiency clothes washers. It also assumes the implementation of future active measures, assuming the implementation of Metropolitan incentive programs at historical annual levels seen in Orange County.

2.4.1 Demand Projection Methodology

The water demand projections were an outcome of the Orange County (OC) Reliability Study led by MWDOC where demand projections were divided into three regions within Orange County: Brea/La Habra, Orange County Groundwater Basin, and South County. The demand projections were obtained based on multiplying a unit water use factor and a demographic factor for three water use sectors, including single-family and multi-family residential (in gallons per day per household), and non-residential (in gallons per day per employee). The unit water use factors were based on a survey of Orange County water agencies (FY 2013-14) and represent a normal weather, normal economy, and non-drought condition. The demographic factors are future demographic projections, including the number of housing units for single and multi-family residential areas and total employment (number of employees) for the non-residential sector, as provided by CDR.

The OC Reliability Study accounted for drought impacts on 2016 demands by applying the assumption that water demands will bounce back to 85 percent of 2014 levels i.e. pre-drought levels by 2020 and 90 percent by 2025 without future conservation, and continue at 90 percent of unit water use through 2040. The unit water use factor multiplied by a demographic factor yields demand projections without new conservation. To account for new conservation, projected savings from new passive and active conservation were subtracted from these demands. The District's portion was estimated as the percentage of the District's five-year (FY 2010-11 to FY 2014-15) average usage compared to the South County region total demand for the same period.

As described above, the OC Reliability Study provided demand projections for three regions within Orange County. Brea/La Habra, Orange County Groundwater Basin, and South County. The District's water demands represent a portion of the South County region total demand. The District's portion was estimated as the percentage of the District's five year (FY 2010-11 to FY 2014-15) average usage compared to the Couth County region total demand for the same period.

2.4.2 Agency Refinement

Demand projections were developed by MWDOC for the District as part of the OC Reliability Study. The future demand projections were reviewed and accepted by the District as a basis for the 2015 UWMP.

2.4.3 25 Year Projections

A key component of the 2015 UWMP is to provide insight into the District's future water demand outlook. The District's current potable water demand is 8,649 AFY, met through purchased imported water from MWDOC. Table 2-4 is a projection of the District's potable water demand for the next 25 years.

Table 2-4: Demands for Potable and Raw Water - Projected (AF)

Retail: Demands for Potable and Raw Water - Projected					
Use Type	Projected Water Use *Report To the Extent that Records are Available*				
	2020	2025	2030	2035	2040
Single Family	1,647	1,829	1,836	1,809	1,802
Multi-Family	2,290	2,542	2,552	2,514	2,504
Institutional/Governmental	44	49	49	48	48
Industrial	786	873	876	864	860
Landscape	1,721	1,910	1,917	1,889	1,882
Losses	173	192	193	190	190
TOTAL	6,661	7,394	7,423	7,315	7,285
NOTES: Data retrieved from ETWD's billing records.					

The above demand values were provided by MWDOC and reviewed by the District as part of the UWMP effort. As the regional wholesale supplier for much of Orange County, MWDOC works in collaboration with each of its retail agencies as well as Metropolitan, its wholesaler, to develop demand projections for imported water. The District will aim to decrease its reliance on imported water by pursuing a variety of water conservation strategies and increasing recycled water use, per capita water use is developed in Section 2.5 below.

Table 2-5: Inclusion in Water Use Projections

Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	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 4.1
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

The demand data presented in this section accounts for passive savings in the future. Passive savings are water savings as a result of codes, standards, ordinances and public outreach on water conservation and higher efficiency fixtures. Passive savings are anticipated to continue for the next 25 years and will result in continued water saving and reduced consumption levels.

2.4.4 Total Water Demand Projections

Based on the information provided above, the total demand for potable water is listed below in Table 2-6. The District plans to expand availability and use of recycled water in its service area.

Table 2-6: Total Water Demands (AF)

Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	8,649	6,661	7,394	7,423	7,315	7,285
Recycled Water Demand	496	1,660	1,660	1,660	1,660	1,660
TOTAL WATER DEMAND	9,145	8,321	9,054	9,083	8,975	8,945
NOTES:						

2.4.5 Water Use for Lower Income Households

Since 2010, the UWMP Act has required retail water suppliers to include water use projections for single-family and multi-family residential housing for lower income and affordable households. This will assist the District in complying with the requirement under Government Code Section 65589.7 granting priority for providing water service to lower income households. A lower income household is defined as a household earning below 80 percent of the median household income (MHI).

DWR recommends retail suppliers rely on the housing elements of City or County general plans to quantify planned lower income housing with the District's service area (DWR, 2015 UWMP Guidebook, February 2016). The Regional Housing Needs Assessment (RHNA) assists jurisdictions in updating general plan's housing elements section. The RHNA identifies housing needs and assesses households by income level for the District through 2010 decennial Census and 2005-2009 American Community Survey data. The fifth cycle of the RHNA covers the planning period of October 2013 to October 2021. The Southern California Association of Governments (SCAG) adopted the RHNA Allocation Plan for this cycle on October 4, 2012 requiring housing elements updates by October 15, 2013. The California Department of Housing and Community Development reviewed the housing elements data submitted by jurisdictions in the SCAG region and concluded the data meets statutory requirements for the assessment of current housing needs.

The projected water demand for low-income households in the District’s service area was estimated by calculating the percentage of projected low income units in the service area as a percentage of the total projected units in the RHNA. The plan breaks down low income housing into three categories: extremely low (less than 30 percent MHI), very low (31 percent - 50 percent MHI), and lower income (51 percent - 80 percent MHI). Given that the District’s service area covers portions of the Cities of Aliso Viejo, Laguna Hills, Laguna Woods, Lake Forest, and Mission Viejo, a weighted average of the RHNA projection for each city served by the District was calculated based on the proportion of each city within the water District. For example, as summarized in Table 2-7, approximately 35 percent of the District’s service area lies within Laguna Woods. Based on the housing elements of the RHNA, the projected housing need for low-income households is 69.73 percent of total housing needs. Therefore, the area weighted projected demands for low-income households for Laguna Woods is 24.41 percent (35 percent times 69.73 percent). The same procedure is repeated for all cities within the District’s service area, which results in an overall projected housing need for low-income households of 44.3 percent as a percentage of total housing units (SCAG, RHNA Allocation Plan, November 2013).

Table 2-7: Household Distribution Based on Median Household Income

City	% Area Served	% Low-income Households by City (RHNA)	Weighted % Low-income Households
Aliso Viejo	2%	25.89%	0.52%
Laguna Hills	18%	37.27%	6.71%
Laguna Woods	35%	69.73%	24.41%
Lake Forest	32%	27.44%	8.78%
Mission Viejo	13%	29.55%	3.84%
Total	100%	**Weighted Average**	**44.3%**

Table 2-8 provides a breakdown of the projected water needs for low income single family and multifamily units. The projected water demands shown here represent 44.3 percent of the projected water demand for the single-family and multifamily categories provided in Table 2-4 above. For example, the total low income single family residential demand is projected to be 730 AFY in 2020 and 798 AFY in 2040.

Table 2-8: Projected Water Demands for Housing Needed for Low Income Households (AF)

Water Use Sector	Fiscal Year Ending				
	2020	2025	2030	2035	2040
Total Residential Demand	3,937	4,370	4,387	4,324	4,306
SF Residential Demand - Low Income Households	730	810	813	801	798
MF Residential Demand - Low Income Households	1,014	1,126	1,130	1,114	1,109
Total Low Income Households Demand	***1,744***	***1,936***	***1,944***	***1,915***	***1,907***

2.5 SBx7-7 Requirements

The Water Conservation Act of 2009, also known as Senate Bill (SB) x7-7, signed into law on February 3, 2010, requires the State of California to reduce urban water use by 20 percent by the year 2020. The District must determine baseline water use during their baseline period and water use targets for the years 2015 and 2020 to meet the state's water reduction goal. The District may choose to comply with SBx7-7 individually or as a region in collaboration with other retail water suppliers in Orange County. Under the regional compliance option, the District is still required to report its individual water use targets. The District is required to be in compliance with SBx7-7 either individually or as part of the alliance, or demonstrate they have a plan or have secured funding to be in compliance, in order to be eligible for water related state grants and loans on or after July 16, 2016.

For the 2015 UWMP, the District must demonstrate compliance with its 2015 water use target to indicate whether or not they are on track to meeting the 2020 water use target. The District also revised their baseline per capita water use calculations using 2010 U.S. Census data. Changes in the baseline calculations also result in updated per capita water use targets.

DWR also requires agencies to submit SBx7-7 Verification Forms, a set of standardized tables to demonstrate compliance with the Water Conservation Act in this 2015 UWMP.

2.5.1 Baseline Water Use

The baseline water use is the District's gross water use divided by its service area population, reported in gallons per capita per day (GPCD). Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area
- Indirect recycled water
- Water placed in long term storage
- Water conveyed to another urban supplier
- Water delivered for agricultural use
- Process water

Water suppliers must report baseline water use for two baseline periods, the 10- to 15-year baseline (baseline GPCD) and the five-year baseline (target confirmation) as described below.

2.5.1.1 Ten to 15-Year Baseline Period (Baseline GPCD)

The first step to calculating the District's water use targets is to determine its base daily per capita water use (baseline water use). This baseline water use is essentially the District's gross water use divided by its service area population, reported in GPCD. The baseline water use is calculated as a continuous (rolling) 10-year average during a period, which ends no earlier than December 31, 2004 and no later than December 31, 2010. Water suppliers whose recycled water made up 10 percent or more of their 2008 retail water delivery can use up to a 15-year average for the calculation. Recycled water use was 3.4 percent of the District's retail delivery in 2008; therefore, a 10-year baseline period is used.

The District's baseline water use is 204 GPCD, obtained from the 10-year period July 1, 1996 to June 30, 2005.

2.5.1.2 Five-Year Baseline Period (Target Confirmation)

Water suppliers are required to calculate water use, in GPCD, for a five-year baseline period. This number is used to confirm that the selected 2020 target meets the minimum water use reduction requirements. Regardless of the compliance option adopted by the District, it will need to meet a minimum water use target of 5 percent reduction from the five-year baseline water use. This five-year baseline water use is calculated as a continuous five-year average during a period, which ends no earlier than December 31, 2007 and no later than December 31, 2010. The District's five-year baseline water use is 202 GPCD, obtained from the five-year period July 1, 2003 to June 30, 2008.

2.5.1.3 Service Area Population

The District's service area boundaries correspond with the boundaries for a city or census designated place. This allows the District to use service area population estimates prepared by the Department of Finance (DOF). CDR is the entity which compiles population data for Orange County based on DOF data. The calculation of the District's baseline water use and water use targets in the 2010 UWMP was based

on the 2000 U.S. Census population numbers obtained from CDR. The baseline water use and water use targets in this 2015 UWMP have been revised based on the 2010 U.S. Census population obtained from CDR in 2012.

2.5.2 SBx7-7 Water Use Targets

In the 2015 UWMP, the District may update its 2020 water use target by selecting a different target method than what was used in 2010. The target methods and determination of the 2015 and 2020 targets are described below.

2.5.2.1 SBx7-7 Target Methods

DWR has established four target calculation methods for urban retail water suppliers to choose from. The District is required to adopt one of the four options to comply with SBx7-7 requirements. The four options include:

- Option 1 requires a simple 20 percent reduction from the baseline by 2020 and 10 percent by 2015.
- Option 2 employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics
    - Residential indoor water use of 55 GPCD
    - Landscape water use commensurate with the Model Landscape Ordinance
    - 10 percent reduction in baseline commercial/industrial/institutional (CII) water use
- Option 3 is to achieve 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.
- Option 4 requires the subtraction of Total Savings from the baseline GPCD:
    - Total savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

With MWDOC's assistance in the calculation of the District's base daily per capita use and water use targets, the District selected to comply with Option 1 consistent with the option selected in 2010.

2.5.2.2 2015 and 2020 Targets

Under Compliance Option 1, the simple 20 percent reduction from the baseline, the District's 2015 target is 183 GPCD and the 2020 target is 163 GPCD as summarized in Table 2-9. The 2015 target is the midway value between the 10-year baseline and the confirmed 2020 target. In addition, the confirmed 2020 target needs to meet a minimum of 5 percent reduction from the five-year baseline water use.

Table 2-9: Baselines and Targets Summary

Baselines and Targets Summary *Retail Agency*					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	*1996*	*2005*	*204*	*183*	*163*
5 Year	*2004*	*2008*	*202*		
*All values are in Gallons per Capita per Day (GPCD)					
NOTES:					

Table 2-10 compares the District's 2015 water use target to its actual 2015 consumption. Based on this comparison, the District is in compliance with its 2015 interim target and has already met its 2020 water use target.

Table 2-10: 2015 Compliance

2015 Compliance *Retail Agency*		
Actual 2015 GPCD*	2015 Interim Target GPCD*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
158	183	Yes
**All values are in Gallons per Capita per Day (GPCD)*		
NOTES:		

2.5.3 Regional Alliance

A retail supplier may choose to meet the SBx7-7 targets on its own or it may form a regional alliance with other retail suppliers to meet the water use target as a region. Within a Regional Alliance, each retail water supplier will have an additional opportunity to achieve compliance under both an individual target and a regional target.

- If the Regional Alliance meets its water use target on a regional basis, all agencies in the alliance are deemed compliant.
- If the Regional Alliance fails to meet its water use target, each individual supplier will have an opportunity to meet their water use targets individually.

The District is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC, its wholesaler. This regional alliance consists of 29 retail agencies in Orange County as described in MWDOC's 2015 UWMP. MWDOC provides assistance in the calculation of each retail agency's baseline water use and water use targets.

In 2015, the regional baseline and targets were revised to account for any revisions made by the retail agencies to their individual 2015 and 2020 targets. The regional water use target is the weighted average of the individual retail agencies' targets (by population). The Orange County 20x2020 Regional Alliance weighted 2015 target is 176 GPCD and 2020 target is 158 GPCD. The actual 2015 water use in the region is 125 GPCD, i.e. the region has already met its 2020 GPCD goal.

3 WATER SOURCES AND SUPPLY RELIABILITY

3.1 Overview

The District relies on a combination of imported water and recycled water to meet its water needs. The District works together with two primary agencies, Metropolitan and MWDOC, to ensure a safe and reliable water supply that will continue to serve the community in periods of drought and shortage. The sources of imported water supplies include water from the Colorado River and the SWP provided by Metropolitan and delivered through MWDOC. The District's projected water supplies portfolio is shown on Figure 3-1.

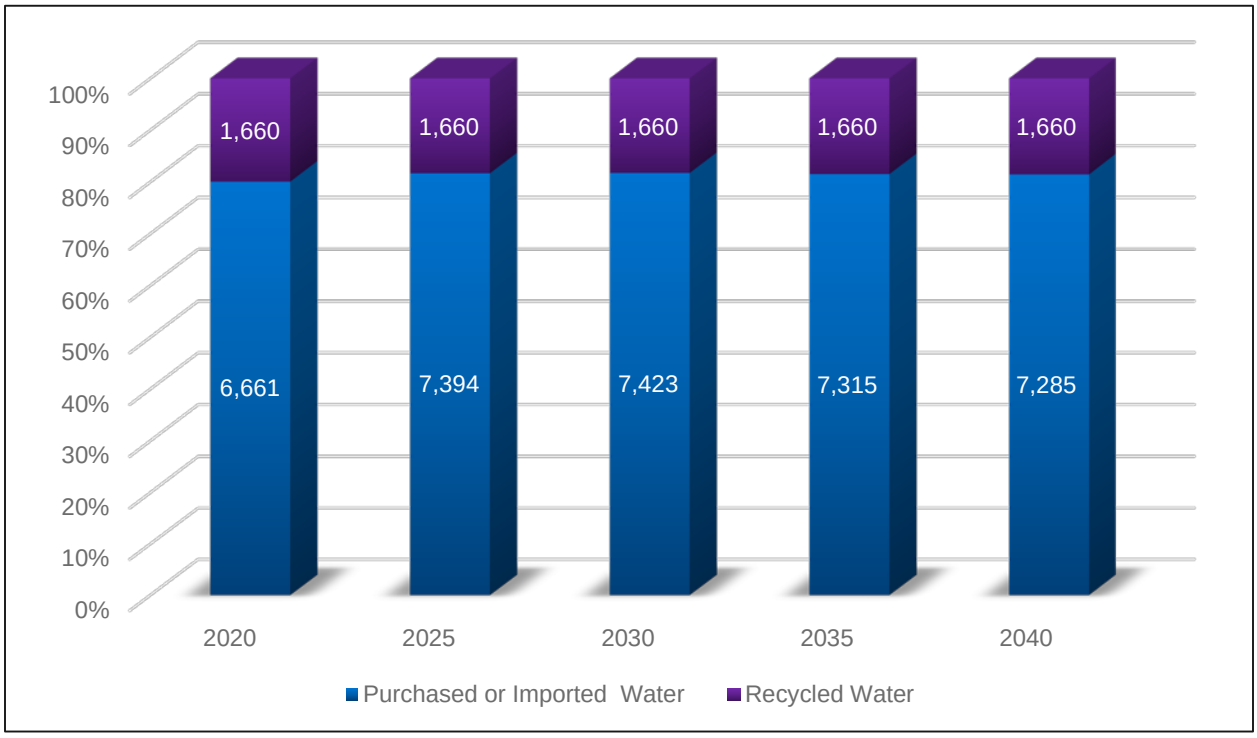


Figure 3-1: Water Supply Sources in the District (AF)

The following sections provide a detailed discussion of the District's water sources as well as projections to the District's future water supply portfolio for the next 25 years. Additionally, the District's projected supply and demand under various hydrological conditions are compared to determine the District's supply reliability for the 25 year planning horizon.

3.2 Imported Water

The District purchases 8,631 AFY of imported water wholesale by Metropolitan through MWDOC. Imported water represents approximately 85 percent of the District's total water supply. Metropolitan's principal sources of water are the Colorado River via the CRA and the Lake Oroville watershed in Northern California through the SWP. The raw water obtained from these sources is, for Orange County,

treated at the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder.

The main supply pipeline to the District is the Allen-McColloch Pipeline (AMP), where the District owns the rights to 26.3 cubic feet per second (cfs) of capacity. The District has three major turnouts off the AMP: OC-76, OC-77, and OC-80 with each turnout being capable of providing a flowrate of 20 cfs. The OC-80 turnout supplies water directly into the R-6 reservoir, and the two other turnouts provide water to the R-6 pressure zone, the upstream side of the Main Pressure Reducing Station, the suction side of the Cherry booster station, and the R-6 reservoir, which provides the majority of the District's water storage.

The District also owns 2 cfs capacity in the Joint Regional Water Supply System (JRWSS). The JRWSS is a take-off from Metropolitan's East Orange County Feeder No. 2. It is managed, operated and maintained by the South Coast Water District (SCWD).

The Aufdenkamp Connection Transmission Main (ACTM) provides an additional emergency supply source for the District. The ACTM is owned and operated by SMWD. While the District does not own any capacity within the ACTM, it has taken water from the pipeline in previous emergency situations. However, the District cannot rely on this connection for instantaneous supply as it must rent a pump to use water from the ACTM (El Toro WD, Water and Sewer Master Plan).

The Baker Water Treatment Plant is planned to be a new 28 million gallons per day (MGD) plant at the existing IRWD's Baker Filtration Plan site in Lake Forest. More information concerning this treatment plan can be found in the Future Projects section.

3.2.1 Colorado River Supplies

The Colorado River was Metropolitan’s original source of water after Metropolitan’s establishment in 1928. The CRA, which is owned and operated by Metropolitan, transports water from the Colorado River to its terminus at Lake Mathews in Riverside County. The actual amount of water per year that may be conveyed through the CRA to Metropolitan’s member agencies is subject to the availability of Colorado River water for delivery.

The CRA includes supplies from the implementation of the Quantification Settlement Agreement and related agreements to transfer water from agricultural agencies to urban uses. The 2003 Quantification Settlement Agreement enabled California to implement major Colorado River water conservation and transfer programs, stabilizing water supplies for 75 years and reducing the state’s demand on the river to its 4.4 MAF entitlement. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 million acre-feet (MAF) on an as-needed basis. Water from the Colorado River or its tributaries is available to users in California, Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as well as to Mexico. California is apportioned the use of 4.4 MAF of water from the Colorado River each year plus one-half of any surplus that may be available for use collectively in Arizona, California, and Nevada. In addition, California has historically been allowed to use Colorado River water apportioned to but not used by Arizona or Nevada. Metropolitan has a basic entitlement of 550,000 AFY of Colorado River water, plus surplus water up to an additional 662,000 AFY when the following conditions exists (Metropolitan, 2015 UWMP, June 2016):

- Water unused by the California holders of priorities 1 through 3

- Water saved by the Palo Verde land management, crop rotation, and water supply program
- When the U.S. Secretary of the Interior makes available either one or both:
    - Surplus water is available
    - Colorado River water is apportioned to but unused by Arizona and/or Nevada

Unfortunately, Metropolitan has not received surplus water for a number of years. The Colorado River supply faces current and future imbalances between water supply and demand in the Colorado River Basin due to long term drought conditions. Over the past 16 years (2000-2015), there have only been three years when the Colorado River flow has been above average (Metropolitan, 2015 UWMP, June 2016). The long-term imbalance in future supply and demand is projected to be approximately 3.2 MAF by the year 2060.

Approximately 40 million people rely on the Colorado River and its tributaries for water with 5.5 million acres of land using Colorado River water for irrigation. Climate change will affect future supply and demand as increasing temperatures may increase evapotranspiration from vegetation along with an increase in water loss due to evaporation in reservoirs, therefore reducing the available amount of supply from the Colorado River and exacerbating imbalances between increasing demands from rapid growth and decreasing supplies.

The Colorado River Basin Water Supply and Demand Study (Study) assessed the historical water supply in the Colorado River Basin through two historical streamflow data sets, from the year 1906 through 2007 and the paleo-reconstructed record from 762 through 2005. The following are findings from the study:

- Increased temperatures in both the Upper and Lower Colorado River Basins since the 1970s has been observed.
- Loss of springtime snowpack was observed with consistent results across the lower elevation northern latitudes of the western United States. The large loss of snow at lower elevations strongly suggest the cause is due to shifts in temperature.
- The deficit between the two year running average flow and the long-term mean annual flow that started in the year 2000 is more severe than any other deficit in the observed period, at nine years and 28 MAF deficit.
- There are deficits of greater severity from the longer paleo record compared to the period from 1906 through 2005. One deficit amounted to 35 MAF through a span of 16 years.
- A summary of the trends from the observed period suggest declining stream flows, increases in variability, and seasonal shifts in streamflow that may be related to shifts in temperature.

Findings concerning the future projected supply include:

- Increased temperatures are projected across the Colorado River Basin with larger changes in the Upper Basin than in the Lower Basin. Annual Basin-wide average temperature is projected to increase by 1.3 degrees Celsius over the period through 2040.
- Projected seasonal trends toward drying are significant in certain regions. A general trend towards drying is present in the Colorado River Basin, although increases in precipitation are projected for

some higher elevation and hydrologically productive regions. Consistent and expansive drying conditions are projected for the spring and summer months throughout the Colorado River Basin, although some areas in the Lower Basin are projected to experience slight increases in precipitation, which is thought to be attributed to monsoonal influence in the region. Upper Basin precipitation is projected to increase in the fall and winter, and Lower Basin precipitation is projected to decrease.

- Snowpack is projected to decrease due to precipitation falling as rain rather than snow and warmer temperatures melting the snowpack earlier. Areas where precipitation does not change or increase is projected to have decreased snowpack in the fall and early winter. Substantial decreases in spring snowpack are projected to be widespread due to earlier melt or sublimation of snowpack.
- Runoff (both direct and base flow) is spatially diverse, but is generally projected to decrease, except in the northern Rockies. Runoff is projected to increase significantly in the higher elevation Upper Basin during winter but is projected to decrease during spring and summer.

The following future actions must be taken to implement solutions and help resolve the imbalance between water supply and demand in areas that use Colorado River water (U.S. Department of the Interior Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study, December 2012):

- Resolution of significant uncertainties related to water conservation, reuse, water banking, and weather modification concepts.
- Costs, permitting issues, and energy availability issues relating to large-capacity augmentation projects need to be identified and investigated.
- Opportunities to advance and improve the resolution of future climate projections should be pursued.
- Consideration should be given to projects, policies, and programs that provide a wide-range of benefits to water users and healthy rivers for all users.

3.2.2 State Water Project Supplies

The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants operated by DWR and is an integral part of the effort to ensure that business and industry, urban and suburban residents, and farmers throughout much of California have sufficient water. The SWP is the largest state-built, multipurpose, user-financed water project in the United States. Nearly two-thirds of residents in California receive at least part of their water from the SWP with approximately 70 percent of SWP's contracted water supply going to urban users and 30 percent to agricultural users. The primary purpose of the SWP is to divert and store water during wet periods in Northern and Central California and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and southern California.

The availability of water supplies from the SWP can be highly variable. A wet water year may be followed by a dry or critically dry year and fisheries issues can restrict the operations of the export pumps even when water supplies are available.

The Sacramento-San Joaquin River Delta (Delta) is key to the SWP's ability to deliver water to its agricultural and urban contractors. All but five of the 29 SWP contractors receive water deliveries below

the Delta (pumped via the Harvey O. Banks or Barker Slough pumping plants). However, the Delta faces many challenges concerning its long-term sustainability such as climate change posing a threat of increased variability in floods and droughts. Sea level rise complicates efforts in managing salinity levels and preserving water quality in the Delta to ensure a suitable water supply for urban and agricultural use. Furthermore, other challenges include continued subsidence of Delta islands, many of which are below sea level, and the related threat of a catastrophic levee failure as the water pressure increases, or as a result of a major seismic event.

Ongoing regulatory restrictions, such as those imposed by federal biological opinions (Biops) on the effects of SWP and the federal Central Valley Project (CVP) operations on certain marine life, also contributes to the challenge of determining the SWP's water delivery reliability. In dry, below-normal conditions, Metropolitan has increased the supplies delivered through the California Aqueduct by developing flexible CVP/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Harvey O. Banks pumping plant capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. In addition, the California State Water Resources Control Board (SWRCB) has set water quality objectives that must be met by the SWP including minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity level.

Metropolitan's Board approved a Delta Action Plan in June 2007 that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta action plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Delta while a long-term solution is implemented. Currently, Metropolitan is working towards addressing three basin elements: Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development.

"Table A" water is the maximum entitlement of SWP water for each water contracting agency. Currently, the combined maximum Table A amount is 4.17 MAFY. Of this amount, 4.13 MAFY is the maximum Table A water available for delivery from the Delta pumps as stated in the State Water Contract. However, deliveries commonly are less than 50 percent of the Table A.

SWP contractors may receive Article 21 water on a short-term basis in addition to Table A water if requested. Article 21 of SWP contracts allows contractors to receive additional water deliveries only under specific conditions, generally during wet months of the year (December through March). Because an SWP contractor must have an immediate use for Article 21 supply or a place to store it outside of the SWP, there are few contractors like Metropolitan that can access such supplies. .

Carryover water is SWP water allocated to an SWP contractor and approved for delivery to the contractor in a given year but not used by the end of the year. The unused water is stored in the SWP's share of San Luis Reservoir, when space is available, for the contractor to use in the following year.

Turnback pool water is Table A water that has been allocated to SWP contractors that has exceeded their demands. This water can then be purchased by another contractor depending on its availability.

SWP Delta exports are the water supplies that are transferred directly to SWP contractors or to San Luis Reservoir storage south of the Delta via the Harvey O. Banks pumping plant. Estimated average annual Delta exports and SWP Table A water deliveries have generally decreased since 2005, when Delta

export regulations affecting SWP pumping operations became more restrictive due to the Biops. A summary of SWP water deliveries from the years 2005 and 2013 is summarized in Table 3-1.

Table 3-1: Metropolitan Colorado River Aqueduct Program Capabilities

Year	Average Annual Delta Exports (MAF)	Average Annual Table A Deliveries (MAF)
2005	2.96	2.82
2013	2.61	2.55
Percent Change	-11.7%	-9.4%

The following factors affect the ability to estimate existing and future water delivery reliability:

- Water availability at the source: Availability depends on the amount and timing of rain and snow that fall in any given year. Generally, during a single dry year or two, surface and groundwater storage can supply most water deliveries, but multiple dry years can result in critically low water reserves.
- Water rights with priority over the SWP: Water users with prior water rights are assigned higher priority in DWR's modeling of the SWP's water delivery reliability, even ahead of SWP Table A water.
- Climate change: mean temperatures are predicted to vary more significantly than previously expected. This change in climate is anticipated to bring warmer winter storms that result in less snowfall at lower elevations, reducing total snowpack. From historical data, DWR projects that by 2050, the Sierra snowpack will be reduced from its historical average by 25 to 40 percent. Increased precipitation as rain could result in a larger number of "rain-on-snow" events, causing snow to melt earlier in the year and over fewer days than historically, affecting the availability of water for pumping by the SWP during summer.
- Regulatory restrictions on SWP Delta exports due to the Biops to protect special-status species such as delta smelt and spring- and winter-run Chinook salmon. Restrictions on SWP operations imposed by state and federal agencies contribute substantially to the challenge of accurately determining the SWP's water delivery reliability in any given year.
- Ongoing environmental and policy planning efforts: the California WaterFix involves water delivery improvements that could reduce salinity levels by diverting a greater amount of lower salinity Sacramento water to the South Delta export pumps. The EcoRestore Program aims to restore at least 30,000 acres of Delta habitat, and plans to be well on the way to meeting that goal by the year 2020.
- Delta levee failure: The levees are vulnerable to failure because most original levees were simply built with soils dredged from nearby channels and were not engineered. A breach of one or more levees and island flooding could affect Delta water quality and SWP operations for several months. When islands are flooded, DWR may need to drastically decrease or even cease SWP Delta exports to evaluate damage caused by salinity in the Delta (Department of Water Resources, The State Water Project Final Delivery Capability Report 2015, July 2015).

DWR has altered the SWP operations to accommodate species of fish listed under the Biops, and these changes have adversely impacted SWP deliveries. DWR's Water Allocation Analysis indicated that export restrictions are currently reducing deliveries to Metropolitan as much as 150 TAF to 200 TAF under median hydrologic conditions.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. New biological opinions for listed species under the Federal ESA or by the California Department of Fish and Game's issuance of incidental take authorizations under the Federal ESA and California ESA might further adversely affect SWP and CVP operations. Additionally, new litigation, listings of additional species or new regulatory requirements could further adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage or other operational changes impacting water supply operations.

3.2.3 Storage

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan (WSAP), is dependent on its storage resources.

Lake Oroville is the SWP's largest storage facility, with a capacity of about 3.5 MAF. The water is released from Oroville Dam into the Feather River as needed, which converges with the Sacramento River while some of the water at Bethany Reservoir is diverted from the California Aqueduct into the South Bay Aqueduct. The primary pumping plant, the Harvey O. Banks pumping plant, pumps Delta water into the California Aqueduct, which is the longest water conveyance system in California.

3.3 Groundwater

The District's water supply portfolio does not include any groundwater.

3.4 Summary of Existing and Planned Sources of Water

The actual sources and volume of water for the year 2015 is displayed in Table 3-2.

Table 3-2: Water Supplies, Actual (AF)

Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Purchased or Imported Water	MWDOC	8,649	Drinking Water
Recycled Water		496	Recycled Water
	Total	9,145	
NOTES:			

A summary of the current and planned sources of water for the District is shown in Table 3-3.

Table 3-3: Water Supplies, Projected (AF)

Retail: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2020	2025	2030	2035	2040
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	MWDOC	6,661	7,394	7,423	7,315	7,285
Recycled Water		1,660	1,660	1,660	1,660	1,660
Total		8,321	9,054	9,083	8,975	8,945
NOTES:						

3.5 Recycled Water

One of the major components of the District's water conservation effort is its recycled water program. The District provides additional treatment to a portion of its secondary treated wastewater. The recycled water is then used for landscape irrigation services. The District's recycled water program is more fully described in Section 6.

3.6 Supply Reliability

3.6.1 Overview

Every urban water supplier is required to assess the reliability of their water service to its customers under normal, dry, and multiple dry water years. The District depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. Development of numerous local augment the reliability of the imported water system. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below. The water supplies are projected to meet full-service demands; Metropolitan's 2015 UWMP finds that Metropolitan is able to meet, full-service demands of its member agencies starting 2020 through 2040 during normal years, single dry year, and multiple dry years.

Metropolitan's 2015 Integrated Water Resources Plan (IRP) update describes the core water resources that will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2020 through 2040. The foundation of Metropolitan's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements.

3.6.2 Factors Impacting Reliability

The Act requires a description of water supply reliability and vulnerability to seasonal or climatic shortage. The following are some of the factors identified by Metropolitan that may have an impact on the reliability of Metropolitan supplies.

3.6.2.1 Environment

Endangered species protection needs in the Delta have resulted in operational constraints to the SWP system, as mentioned previously in the State Water Project Supplies section.

3.6.2.2 Legal

The addition of more species under the Endangered Species Act and new regulatory requirements could impact SWP operations by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations.

3.6.2.3 Water Quality

Metropolitan is responsible for providing high quality potable water throughout its service area. Over 300,000 water quality tests are performed per year on Metropolitan's water to test for regulated contaminants and additional contaminants of concern to ensure the safety of its waters. Metropolitan's supplies originate primarily from the CRA and from the SWP. A blend of these two sources, proportional to each year's availability of the source, is then delivered throughout Metropolitan's service area.

Metropolitan's primary water sources face individual water quality issues of concern. The CRA water source contains higher total dissolved solids (TDS) and the SWP contains higher levels of organic matter, lending to the formation of disinfection byproducts. To remediate the CRA's high level of salinity and the SWP's high level of organic matter, Metropolitan blends CRA and SWP supplies and has upgraded all of its treatment facilities to include ozone treatment processes. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of emerging contaminants, N-nitrosodimethylamine (NDMA), and pharmaceuticals and personal care products (PPCP). While unforeseeable water quality issues could alter reliability, Metropolitan's current strategies ensure the deliverability of high quality water.

The presence of Quagga Mussels in water sources is a water quality concern. Quagga Mussels are an invasive species that was first discovered in 2007 at Lake Mead, on the Colorado River. This species of mussels form massive colonies in short periods of time, disrupting ecosystems and blocking water intakes. They are capable of causing significant disruption and damage to water distribution systems. Controlling the spread and impacts of this invasive species within the CRA requires extensive maintenance and results in reduced operational flexibility. It also resulted in Metropolitan eliminating deliveries of CRA water into Diamond Valley Lake (DVL) to keep the reservoir free from Quagga Mussels.

3.6.2.4 Climate Change

Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning more challenging. The areas of concern for California include a reduction in Sierra Nevada Mountain snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of Delta levee failure, seawater intrusion of coastal groundwater basins, and potential cutbacks on the SWP and CVP. The major impact in California is that without additional surface storage, the earlier and heavier runoff (rather than snowpack retaining water in storage in the mountains), will result in more water being lost to the oceans. A heavy emphases on storage is needed in the State of California.

In addition, the Colorado River Basin supplies have been inconsistent since about the year 2000, resulting in 13 of the last 16 years of the upper basin runoff being below normal. Climate models are predicting a continuation of this pattern whereby hotter and drier weather conditions will result in continuing lower runoff.

Legal, environmental, and water quality issues may have impacts on Metropolitan supplies. It is felt, however, that climatic factors would have more of an impact than legal, water quality, and environmental factors. Climatic conditions have been projected based on historical patterns but severe pattern changes are still a possibility in the future.

3.6.3 Normal-Year Reliability Comparison

The water demand forecasting model developed for the OC Reliability Study (described in Section 2.4.1), to project the 25-year demand for Orange County water agencies, also isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The explanatory variables of population, temperature, precipitation, unemployment rate, drought restrictions, and conservation measures were used to create the statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition. The average (normal) demand is represented by the average water demand of 1990 to 2014 (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016).

The District is 100 percent reliable for normal year demands from 2020 through 2040. The District has entitlements to receive imported water from Metropolitan through MWDOC via connections to Metropolitan's regional distribution system. Although pipeline and connection capacity rights do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies are assumed available to the District from existing water transmission facilities.

3.6.4 Single-Dry Year Reliability Comparison

A single-dry year is defined as a single year of no to minimal rainfall within a period that average precipitation is expected to occur. The water demand forecasting model developed for the OC Reliability Study (described in Section 2.4.1) isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (1990-2014). For a single dry year condition (FY2013-14), the model projects a nine percent increase in demand for the South County area where the District’s service area is located (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016). Detailed information of the model is included in Appendix F.

The District has documented that it is 100 percent reliable for single dry year demands from 2020 through 2040 with a demand increase of nine percent from normal demand with significant reserves held by Metropolitan, local groundwater supplies, and conservation.

3.6.5 Multiple-Dry Year Period Reliability Comparison

Multiple-dry years are defined as three or more consecutive years with minimal rainfall within a period of average precipitation. The water demand forecasting model developed for the OC Reliability Study (described in Section 2.4.1) isolated the impacts that weather and future climate can have on water demand through the use of a statistical model. The impacts of hot/dry weather condition are reflected as a percentage increase in water demands from the average condition (1990-2014). For a single dry year condition (FY2013-14), the model projects a nine percent increase in demand for the South County area where the District’s service area is located (CDM Smith, Final Technical Memorandum #1 of Orange County Reliability Study, April 2016). It is conservatively assumed that a three-year multi dry year scenario is a repeat of the single dry year over three consecutive years (FY 2011-12 through FY 2013-14).

The District is capable of meeting all customers' demands with significant reserves held by Metropolitan, local groundwater supplies, and conservation in multiple dry years from 2020 through 2040 with a demand increase of nine percent from normal demand with significant reserves held by Metropolitan, local groundwater supplies, and conservation. The basis of the water year is displayed in Table 3-4.

Table 3-4: Basis of Water Year Data

Retail: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	1990-2014		100%
Single-Dry Year	2014		109%
Multiple-Dry Years 1st Year	2012		109%
Multiple-Dry Years 2nd Year	2013		109%
Multiple-Dry Years 6th Year	2014		109%
NOTES:			

3.7 Supply and Demand Assessment

A comparison between the supply and demand for projected years between 2020 and 2040 is shown in Table 3-5. As stated above, the available supply will meet projected demand due to diversified supply and conservation measures.

Table 3-5: Normal Year Supply and Demand Comparison (AF)

Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	8,321	9,054	9,083	8,975	8,945
Demand totals	8,321	9,054	9,083	8,975	8,945
Difference	0	0	0	0	0
NOTES:					

A comparison between the supply and the demand in a single dry year and multiple dry years are shown in Tables 3-6 and 3-7 respectively. As stated above, the available supply will meet projected demand due to diversified supply and conservation measures.

Table 3-6: Single Dry Year Supply and Demand Comparison (AF)

Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	9,070	9,869	9,900	9,783	9,750
Demand totals	9,070	9,869	9,900	9,783	9,750
Difference	0	0	0	0	0
NOTES: Developed by MWDOC as 2015 Bump Methodology					

Table 3-7: Multiple Dry Years Supply and Demand Comparison (AF)

Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	9,070	9,869	9,900	9,783	9,750
	Demand totals	9,070	9,869	9,900	9,783	9,750
	Difference	0	0	0	0	0
Second year	Supply totals	9,070	9,869	9,900	9,783	9,750
	Demand totals	9,070	9,869	9,900	9,783	9,750
	Difference	0	0	0	0	0
Third year	Supply totals	9,070	9,869	9,900	9,783	9,750
	Demand totals	9,070	9,869	9,900	9,783	9,750
	Difference	0	0	0	0	0
NOTES: Developed by MWDOC as 2015 Bump Methodology						

4 DEMAND MANAGEMENT MEASURES

The goal of the Demand Management Measures (DMM) section is to provide a comprehensive description of the water conservation programs that a supplier has implemented, is currently implementing, and plans to implement in order to meet its urban water use reduction targets. The reporting requirements for DMM has been significantly modified and streamlined in 2014 by Assembly Bill 2067. For a retail agency such as the District the reporting requirements changed from having 14 specific measures to six more general requirements plus an “other” category.

4.1 Water Waste Prevention Ordinances

The District’s Board of Directors adopted a Water Conservation and Water Supply Shortage Ordinance (Ordinance No. 2015-3) on June 9, 2015. The Ordinance establishes a Water Conservation and Water Supply Shortage Program designed to enable effective potable water supply planning, assure reasonable and beneficial use of potable water, and prevent waste of potable water and maximize efficient use in the District. This Ordinance, in conjunction with the District’s water budget based tiered conservation rate structure establishes permanent mandatory water conservation measures that area designed to alter behaviors related to potable water use efficiency during non-shortage conditions, including

- Limits on outside watering hours
- Limits on outside watering duration
- No excessive water flow or runoff
- No outside watering when it is raining
- Obligations to fix leaks, breaks, and malfunctions in lines, fixtures, or facilities
- No hosing or washing down hard or paved surfaces
- No hosing or washing down vehicles
- Re-circulating decorative water fountains and features
- Limits on washing vehicles
- Drinking water served upon requests only
- Commercial food-serving and lodging requirements
- Water served upon request
- Option not to have towels/linen laundered
- Commercial kitchen requirements
- Water efficient pre-rinse kitchen spray valves
- Commercial water recirculation requirements
- Car wash and laundry requirements

- No single pass cooling systems
- Indiscriminate water use
- Public health and safety

The Ordinance also establishes three levels of potential response to escalating water supply shortages that the District may implement during times of declared water shortage or water emergency. The three levels of response consist of expanded water use restrictions and the possible imposition of water supply shortage allocations through the use of a “drought factor” in conjunction with the budget based tiered rate structure. The provisions and water conservation measures to be implemented in response to each shortage phase are described in Section 5 of the UWMP. The District’s water conservation ordinance is included in Appendix C.

4.2 Metering

All water service connections supplied by the District are fully metered and customers are billed by volume of water used. The District requires individual metering for all new connections.

The District targets replacing meters every 15 years. The district does not have a billing meter calibration program but does have a production meter calibration program.

The District does not currently have plans to implement an innovative metering program, but is looking into potential funding sources and the costs versus benefits of advanced metering infrastructure (AMI) and automatic meter reading (AMR).

4.3 Conservation Pricing

The District uses a budget-based tiered rate structure that comprises a fixed charge and a variable commodity charge. The fixed charges are based upon meter size and include Water Operations and Maintenance Charge, Capital Replacement and Refurbishment Charge, and Sewer Operations and Maintenance Charge. The water usage charge increases with usage as structured into four tiers. Each customer metered is allocated a water use budget per tier. Table 4-2 shows the District’s water use rates effective as of August 1, 2015.

Table 4-1: Water Usage Rates

Water Use Charges	Price/CCF
Tier I – Indoor	$2.46
Tier II – Outdoor	$2.83
Tier III – Inefficient	$5.61
Tier IV - Excessive	$7.18

4.4 Public Education and Outreach

The District's public education and outreach program is administered by the District's wholesaler, MWDOC. MWDOC has established an extensive public education and outreach program to assist its retail agencies in promoting water use efficiency awareness within their service areas. MWDOC's public education and outreach programs consist of five primary activities as described below.

In addition to the primary programs it administers, MWDOC also maintains a vibrant public website (www.mwdoc.com) as well as a social media presence on Facebook, Twitter and Instagram. MWDOC's Facebook page has more than 1,200 followers. The social media channels are used to educate the public about water-efficiency, rates and other water-related issues.

MWDOC's public education and outreach programs are described below:

School Education Programs

MWDOC school education programs reach more than 100,000 students per year. The program is broken into elementary and high school components.

- *Elementary School Program* reaches 60,000 students throughout Orange County through assemblies hosted by the Discovery Science Center. MWDOC holds a $220,000 contract with the Discovery Science Center, funded proportionally by the participating MWDOC retail agencies.
- *High School Program* is new in 2015-16 and will reach students in 20 high schools in Orange County. The program is administered by MWDOC and operated by two contractors, the OC Department of Education and the Ecology Center. Through the three-year contract, those agencies will train more than 100 county teachers on water education on topics such as, water sources, water conservation, water recycling, watersheds, and ecological solutions for the benefit of their current and future students. Teachers will learn a variety of water conservation methods, such as irrigation technology, rainwater harvesting, water recycling, and water footprinting through a tour at the Ecology Center facility. These trainings allow teachers to support student -led conservation efforts. The program will reach a minimum of 25,000 students by providing in-classroom water education and helping students

plan and implement campus wide “Water Expos” that will allow peer-to-peer instruction on water issues. The $80,000 program is funded by participating agencies.

Value of Water Communication Program

MWDOC administers this program on behalf of 14 agencies. The $190,000 program involves the water agencies developing 30 full news pages that will appear weekly in the Orange County Register, the largest newspaper in the county, with a Sunday readership of 798,000. The campaign will educate OC residents and business leaders on water infrastructure issues and water efficiency measures, as well as advertise water related events and other pertinent information.

Quarterly Water Policy Dinners

The Water Policy Dinner events attract 225 to 300 water and civic leaders every quarter. The programs host speakers topical to the OC water industry, with recent addresses from Felicia Marcus of the state water board and Dr. Lucy Jones, a noted expert on earthquakes and their potential impact on infrastructure.

Annual Water Summit

The annual Water Summit brings together 300 Orange County water and civic leaders with state and national experts on water infrastructure and governance issues. The half-day event has a budget of $80,000 per year. Portions of the cost are covered by attendance and sponsorships, while MWDOC splits a portion with its event partner, the Orange County Water District.

Water Inspection Trips

Water Inspection trips take stakeholders on tours of the CRA, California Delta and other key water infrastructure sites. The public trips are required under Metropolitan’s regulations. While Metropolitan covers the cost of the trips, MWDOC has two members of the public affairs staff that work diligently on identifying OC residents and leaders to attend. MWDOC staff also attends each trip. In the past year, MWDOC participated in a dozen trips, each taking an average of 30 residents. MWDOC also works with Metropolitan on special trips to educate County Grand Jurors the key water infrastructure.

The District also augments MWDOC’s public information program with the following activities:

- Conservation messages on consumer water bills
- Informational brochures consisting of Metropolitan/MWDOC literature available at the District’s office
- Monthly appearances by the District Board members on local cable TV to address water issues
- Periodic distribution of pamphlets offering water conservation tips
- Presentations to community groups addressing water supply, water quality, and water conservation issues (speakers bureau)
- Meetings with large-scale irrigators such as homeowner associations, Management Groups and County Landscape Maintenance Supervisors to encourage elimination of slope runoff, and inefficient and/or excessive water use
- Presenting previous consumption data on current billings, and

- Participation at special events (fairs, festivals and forums).

4.5 Programs to Assess and Manage Distribution System Real Loss

Senate Bill 1420 signed into law in September 2014 requires urban water suppliers that submit UWMPs to calculate annual system water losses using the water audit methodology developed by the AWWA. SB 1420 requires the water loss audit be submitted to DWR every five years as part of the urban water supplier's UWMP. Water auditing is the basis for effective water loss control. DWR's UWMP Guidebook include a water audit manual intended to help water utilities complete the AWWA Water Audit on an annual basis. A Water Loss Audit was completed for the District that quantified total loss. Multiple criteria are a part of each validity score and a system wide approach will need to be implemented for the District's improvement. Quantified water loss for the CY 2015 was 376 AFY.

The District started performing distribution system prescreening audit in 1999. The prescreening audit results were used to determine the need for a full-scale system audit. The prescreening system audit involves determining 1) metered sales, 2) total supply into the system, and 3) other system verifiable uses. If the quantity of metered sales plus other verifiable uses divided by total supply into the system is less than 0.9 then a full-scale system audit is required. Thus far, a full-scale system audit has not been required.

The District does not have a routine and planned system maintenance; rather, it has a reactive system. The District does not have a program to detect leaks but does have one to repair them.

4.6 Water Conservation Program Coordination and Staffing Support

The District employs a Customer Service Manager who serves as a conservation coordinator a quarter of the time. The position was created in 1995. The responsibilities of the Customer Service Manager include coordinating and working closely with District's customers, MWDOC, Metropolitan, the CUWCC, and others. Other staff share in these responsibilities. The District's water conservation program is funded from the rate revenue.

4.7 Other Demand Management Measures

During the past five years, FY 2010-11 to 2014-15, the District, with the assistance of MWDOC, has implemented many water use efficiency programs for its residential, CII, and landscape customers as described below. Appendix H provides quantities of rebates and installations achieved under each program since program inception. The District will continue to implement all applicable programs in the next five years.

4.7.1 Residential Programs

Water Smart Home Survey Program

The Water Smart Home Survey Program provides free home water surveys (indoor and outdoor). The Water Smart Home Survey Program uses a Site Water Use Audit program format to perform comprehensive, single-family home audits. Residents choose to have outdoor (and indoor, if desired)

audits to identify opportunities for water savings throughout their properties. A customized home water audit report is provided after each site audit is completed and provides the resident with their survey results, rebate information, and an overall water score.

High Efficiency Clothes Washer Rebate Program

The High Efficiency Clothes Washer (HECW) Rebate Program provides residential customers with rebates for purchasing and installing WaterSense labeled HECWs. HECWs use 35-50 percent less water than standard washer models, with savings of approximately 9,000 gallons per year, per device. Devices must have a water factor of 4.0 or less, and a listing of qualified products can be found at ocwatersmart.com. There is a maximum of one rebate per home.

High Efficiency Toilet Rebate Program

The largest amount of water used inside a home, 30 percent, goes toward flushing the toilet. The High Efficiency Toilet (HET) Rebate Program offers incentives to residential customers for replacing their standard, water-guzzling toilets with HETs. HETs use just 1.28 gallons of water or less per flush, which is 20 percent less water than standard toilets. In addition, HETS save an average of 38 gallons of water per day while maintaining high performance standards.

4.7.2 CII Programs

Water Smart Hotel Program

Water used in hotels and other lodging businesses accounts for approximately 15 percent of the total water use in commercial and institutional facilities in the United States. The Water Smart Hotel Program provides water use surveys, customized facility reports, technical assistance, and enhanced incentives to hotels that invest in water use efficiency improvements. Rebates available include HETs, ultralow volume urinals, air-cooled ice machines, weather-based irrigation controllers, and rotating nozzles.

Socal Water$mart Rebate Program for CII

The District through MWDOC offers financial incentives under the Socal Water$mart Rebate Program which offers rebates for various water efficient devices to CII customers, such as HETs, ultralow volume urinals, connectionless food steamers, air-cooled ice machines, pH-cooling towers controller, and dry vacuum pumps.

4.7.3 Landscape Programs

Turf Removal Program

The Orange County Turf Removal Program offers incentives to remove non-recreational turf grass from commercial properties throughout the County. This program is a partnership between MWDOC, Metropolitan, and local retail water agency. The goals of this program are to increase water use efficiency within Orange County, reduce runoff leaving the properties, and evaluate the effectiveness of turf removal as a water-saving practice. Participants are encouraged to replace their turf grass with drought-tolerant landscaping, diverse plant palettes, and artificial turf, and they are encouraged to retrofit their irrigation systems with Smart Timers and drip irrigation (or to remove it entirely).

Water Smart Landscape Program

MWDOC's Water Smart Landscape Program is a free water management tool for homeowner associations, landscapers, and property managers. Participants in the program use the Internet to track their irrigation meter's monthly water use and compare it to a custom water budget established by the program. This enables property managers and landscapers to easily identify areas that are over/under watered and enhances their accountability to homeowner association boards.

Smart Timer Rebate Program

Smart Timers are irrigation clocks that are either weather based irrigation controllers (WBIC) or soil moisture sensor systems. WBICs adjust automatically to reflect changes in local weather and site-specific landscape needs, such as soil type, slopes, and plant material. When WBICs are programmed properly, turf and plants receive the proper amount of water throughout the year. During the fall months, when property owners and landscape professionals often overwater, Smart Timers can save significant amounts of water.

Rotating Nozzles Rebate Program

The Rotating Nozzle Rebate Program provides incentives to residential and commercial properties for the replacement of high-precipitation rate spray nozzles with low-precipitation rate multi-stream, multi-trajectory rotating nozzles. The rebate offered through this Program aims to offset the cost of the device and installation.

Spray to Drip Rebate Program

The Spray to Drip Pilot Rebate Program offers residential and commercial customers rebates for converting planting areas irrigated by spray heads to drip irrigation. Drip irrigation systems are very water-efficient. Rather than spraying wide areas, drip systems use point emitters to deliver water to specific locations at or near plant root zones. Water drips slowly from the emitters either onto the soil surface or below ground. As a result, less water is lost to wind and evaporation.

Socal Water$mart Rebate Program for Landscape

The District through MWDOC also offers financial incentives under the SoCal Water$mart Rebate Program for a variety of water efficient landscape devices, such as Central Computer Irrigation Controllers, large rotary nozzles, and in-stem flow regulators.

5 WATER SHORTAGE CONTINGENCY PLAN

5.1 Overview

In connection with recent water supply challenges, the State Water Resources Control Board found that California has been subject to multi-year droughts in the past, and the Southwest is becoming drier, increasing the probability of prolonged droughts in the future. Due to current and potential future water supply shortages, Governor Brown issued a drought emergency proclamation in January 2014 and signed the 2014 Executive Order that directs urban water suppliers to implement drought response plans to limit outdoor irrigation and wasteful water practices if they are not already in place. Pursuant to California Water Code Section 106, it is the declared policy of the state that domestic water use is the highest use of water and the next highest use is irrigation. This section describes the water supply shortage policies Metropolitan and the District have in place to respond to events including catastrophic interruption and reduction in water supply.

5.2 Shortage Actions

5.2.1 Metropolitan Water Surplus Drought Management Plan

Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage annually. Each stage is associated with specific resource management actions to avoid extreme shortages to the extent possible and minimize adverse impacts to retail customers should an extreme shortage occur. The sequencing outlined in the Water Surplus and Drought Management (WSDM) Plan reflects anticipated responses towards Metropolitan's existing and expected resource mix.

Surplus stages occur when net annual deliveries can be made to water storage programs. Under the WSDM Plan, there are four surplus management stages that provides a framework for actions to take for surplus supplies. Deliveries in DVL and in SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage.

The WSDM Plan distinguishes between shortages, severe shortages, and extreme shortages. The differences between each term is listed below.

- Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands using stored water or water transfers as necessary.
- Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.
- Extreme Shortage: Metropolitan must allocate available supply to full-service customers.

There are six shortage management stages to guide resource management activities. These stages are defined by shortfalls in imported supply and water balances in Metropolitan's storage programs. When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Figure 5-1 gives a summary of actions under each surplus and shortage stages when

an allocation plan is necessary to enforce mandatory cutbacks. The goal of the WSDM Plan is to avoid Stage 6, an extreme shortage.

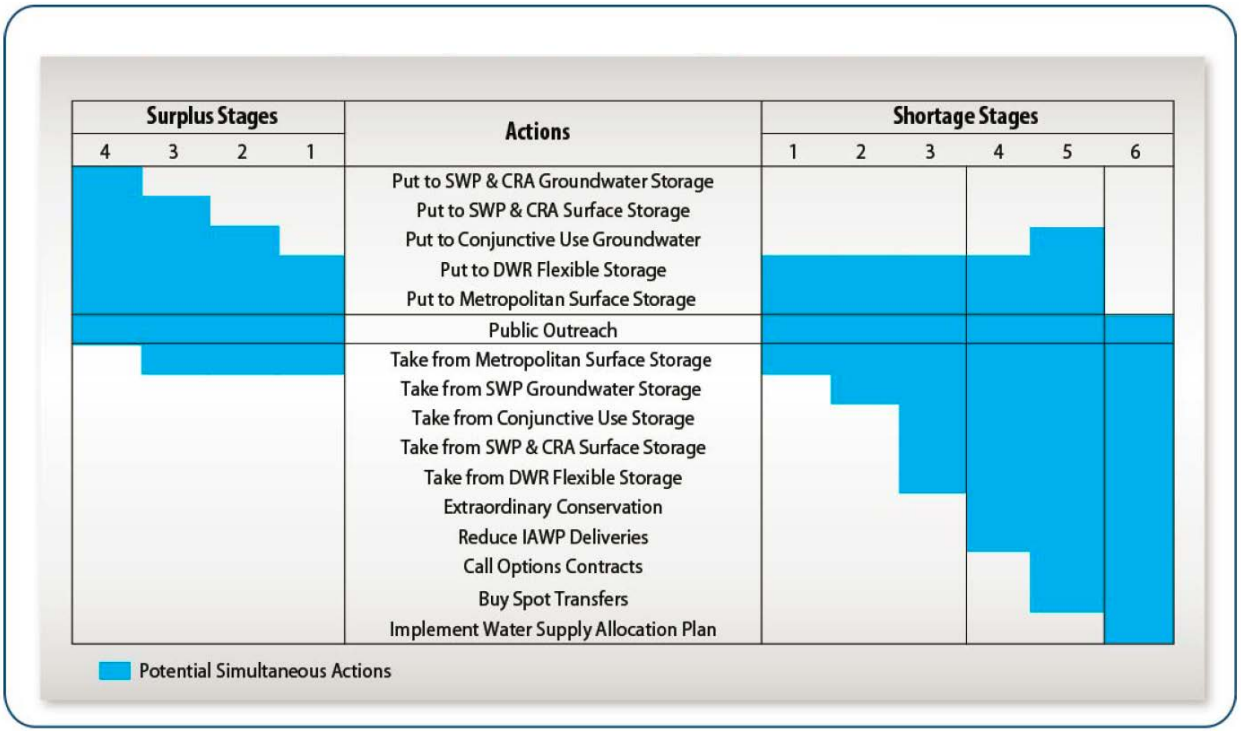


Figure 5-1: Resource Stages, Anticipated Actions, and Supply Declarations

Metropolitan's Board of Directors adopted a Water Supply Condition Framework in June 2008 in order to communicate the urgency of the region's water supply situation and the need for further water conservation practices. The framework has four conditions, each calling increasing levels of conservation. Descriptions for each of the four conditions are listed below:

- Baseline Water Use Efficiency: Ongoing conservation, outreach, and recycling programs to achieve permanent reductions in water use and build storage reserves.
- Condition 1 Water Supply Watch: Local agency voluntary dry-year conservation measures and use of regional storage reserves.
- Condition 2 Water Supply Alert: Regional call for cities, counties, member agencies, and retail water agencies to implement extraordinary conservation through drought ordinances and other measures to mitigate use of storage reserves.
- Condition 3 Water Supply Allocation: Implement Metropolitan's WSAP

As noted in Condition 3, should supplies become limited to the point where imported water demands cannot be met, Metropolitan will allocate water through the WSAP (Metropolitan, 2015 UWMP, June 2016).

5.2.2 Metropolitan Water Supply Allocation Plan

Metropolitan's imported supplies have been impacted by a number of water supply challenges as noted earlier. In case of extreme water shortage within the Metropolitan service area the response is the implementation of its WSAP.

Metropolitan's Board of Directors adopted the WSAP in February 2008 to fairly distribute a limited amount of water supply and to apply it through a detailed methodology to reflect a range of local conditions and needs of the region's retail water consumers.

The WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 2015 UWMP.

Metropolitan's WSAP was developed in consideration of the principles and guidelines in Metropolitan's 1999 WSDM Plan with the core objective of creating an equitable "needs-based allocation". The WSAP's formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account a number of factors, such as the impact on retail customers, growth in population, changes in supply conditions, investments in local resources, demand hardening aspects of water conservation savings, recycled water, extraordinary storage and transfer actions, and imported water needs.

The formula is calculated in three steps: 1) based period calculations, 2) allocation year calculations, and 3) supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

Step 1: Base Period Calculations – The first step in calculating a member agency's water supply allocation is to estimate their water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of supply and demand is calculated using data from the two most recent non-shortage fiscal years ending 2013 and 2014.

Step 2: Allocation Year Calculations – The next step in calculating the member agency's water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population growth and changes in local supplies.

Step 3: Supply Allocation Calculations – The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2.

In order to implement the WSAP, Metropolitan's Board of Directors makes a determination on the level of the regional shortage, based on specific criteria, typically in April. The criteria used by Metropolitan includes, current levels of storage, estimated water supplies conditions, and projected imported water demands. The allocations, if deemed necessary, go into effect in July of the same year and remain in effect for a 12-month period. The schedule is made at the discretion of the Board of Directors.

Although Metropolitan's 2015 UWMP forecasts that Metropolitan will be able to meet projected imported demands throughout the projected period from 2020 to 2040, uncertainty in supply conditions can result

in Metropolitan needing to implement its WSAP to preserve dry-year storage and curtail demands (Metropolitan, 2015 UWMP, June 2016).

5.2.3 MWDOC Water Supply Allocation Plan

To prepare for the potential allocation of imported water supplies from Metropolitan, MWDOC worked collaboratively with its 28 retail agencies to develop its own WSAP that was adopted in January 2009 and amended in 2015. The MWDOC WSAP outlines how MWDOC will determine and implement each of its retail agency's allocation during a time of shortage.

The MWDOC WSAP uses a similar method and approach, when reasonable, as that of the Metropolitan's WSAP. However, MWDOC's plan remains flexible to use an alternative approach when Metropolitan's method produces a significant unintended result for the member agencies. The MWDOC WSAP model follows five basic steps to determine a retail agency's imported supply allocation.

Step 1: Determine Baseline Information – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the last two non-shortage fiscal years ending 2013 and 2014.

Step 2: Establish Allocation Year Information – In this step, the model adjusts for each retail agency's water need in the allocation year. This is done by adjusting the base period estimates for increased retail water demand based on population growth and changes in local supplies.

Step 3: Calculate Initial Minimum Allocation Based on Metropolitan's Declared Shortage Level – This step sets the initial water supply allocation for each retail agency. After a regional shortage level is established, MWDOC will calculate the initial allocation as a percentage of adjusted Base Period Imported water needs within the model for each retail agency.

Step 4: Apply Allocation Adjustments and Credits in the Areas of Retail Impacts and Conservation– In this step, the model assigns additional water to address disparate impacts at the retail level caused by an across-the-board cut of imported supplies. It also applies a conservation credit given to those agencies that have achieved additional water savings at the retail level as a result of successful implementation of water conservation devices, programs and rate structures.

Step 5: Sum Total Allocations and Determine Retail Reliability – This is the final step in calculating a retail agency's total allocation for imported supplies. The model sums an agency's total imported allocation with all of the adjustments and credits and then calculates each agency's retail reliability compared to its Allocation Year Retail Demand.

The MWDOC WSAP includes additional measures for plan implementation, including the following:

- Appeal Process – An appeals process to provide retail agencies the opportunity to request a change to their allocation based on new or corrected information. MWDOC anticipates that under most circumstances, a retail agency's appeal will be the basis for an appeal to Metropolitan by MWDOC.
- Melded Allocation Surcharge Structure – At the end of the allocation year, MWDOC would only charge an allocation surcharge to each retail agency that exceeded their allocation if MWDOC exceeds its total allocation and is required to pay a surcharge to Metropolitan. Metropolitan enforces

allocations to retail agencies through an allocation surcharge to a retail agency that exceeds its total annual allocation at the end of the 12-month allocation period. MWDOC's surcharge would be assessed according to the retail agency's prorated share (acre-feet over usage) of MWDOC amount with Metropolitan. Surcharge funds collected by Metropolitan will be invested in its Water Management Fund, which is used to in part to fund expenditures in dry-year conservation and local resource development.

- Tracking and Reporting Water Usage – MWDOC will provide each retail agency with water use monthly reports that will compare each retail agency's current cumulative retail usage to their allocation baseline. MWDOC will also provide quarterly reports on it cumulative retail usage versus its allocation baseline.
- Timeline and Option to Revisit the Plan – The allocation period will cover 12 consecutive months and the Regional Shortage Level will be set for the entire allocation period. MWDOC only anticipates calling for allocation when Metropolitan declares a shortage; and no later than 30 days from Metropolitan's declaration will MWDOC announce allocation to its retail agencies.

5.2.4 El Toro Water District

The District Board of Directors adopted Water Supply Shortage Ordinance No. 2015-3 on June 9, 2015, rescinding Ordinance No. 2010-01. Ordinance No. 2015-03 establishes a comprehensive staged water conservation program that encourages reduced water consumption within the District through acts of conservation, effective water supply planning, reasonable and beneficial use of water, preventing waste of water, and efficient use of water. Along with permanent water conservation requirements, the District's Comprehensive Water Conservation Program consists of the following three stages found in Table 5-1 to respond to a reduction in potable water available to the District for distribution to its customers. Permanent mandatory water conservation measures are in effect at all times unless a mandatory conservation stage has been implemented by the Board of Directors (El Toro WD, Ordinance No. 2015-03, June 2015).

Table 5-1: Stages of Water Shortage Contingency Plan

Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction	Water Supply Condition
1	Up to 20%	A Level 1 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during which, at its sole discretion, determines and declares that a further additional reduction in consumer demand is necessary due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions.
2	Up to 40%	A Level 2 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during which, at its sole discretion, determines and declares that a further additional reduction in consumer demand is necessary due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions.
3	Greater than 40%	A Level 3 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during which, at its sole discretion, determines and declares that a further additional reduction in consumer demand is necessary due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions.
NOTES:		

5.3 Three-Year Minimum Water Supply

As a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies. As such, Metropolitan member agencies must develop their own estimates for the purposes of meeting the requirements of the Act.

Section 135 of the Metropolitan Water District Act declares that a member agency has the right to invoke its “preferential right” to water, which grants each member agency a preferential right to purchase a percentage of Metropolitan’s available supplies based on specified, cumulative financial contributions to Metropolitan. Each year, Metropolitan calculates and distributes each member agency’s percentage of preferential rights. However, since Metropolitan’s creation in 1927, no member agency has ever invoked these rights as a means of acquiring limited supplies from Metropolitan.

MWDOC has adopted a shortage allocation plan and accompanying allocation model that estimates firm demands on MWDOC. Assuming MWDOC would not be imposing mandatory restrictions if Metropolitan is not, the estimate of firm demands in MWDOC’s latest allocation model has been used to estimate the minimum imported supplies available to each of MWDOC’s retail agencies for 2015-2018. Thus, the estimate of the minimum imported supplies available to the District is 9,595 AF (MWDOC, Water Shortage Allocation Model, November 2015).

As captured in its 2015 UWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed that Metropolitan and MWDOC will be able to maintain the identified supply amounts throughout the three-year period.

Metropolitan projects reliability for full service demands through the year 2040. Based on the MWDOC WSAP, the District is expected to fully meet demands for the next three years assuming Metropolitan and MWDOC are not in shortage and zero allocations are imposed for Imported Supplies. The Three Year Estimated Minimum Water Supply is listed in Table 5-2.

Table 5-2: Minimum Supply Next Three Years (AF)

Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	9,595	9,595	9,595
NOTES:			

5.4 Catastrophic Supply Interruption

Given the great distances that imported supplies travel to reach Orange County, the region is vulnerable to interruptions along hundreds of miles aqueducts, pipelines and other facilities associated with delivering the supplies to the region. Additionally, the infrastructure in place to deliver supplies are susceptible to damage from earthquakes and other disasters.

5.4.1 Metropolitan

Metropolitan has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM Plan and WSAP. Metropolitan also developed an Emergency Storage Requirement to mitigate against potential interruption in water supplies resulting from catastrophic occurrences within the southern California region, including seismic events along the San Andreas Fault. In addition, Metropolitan is working with the state to implement a comprehensive improvement plan to address catastrophic occurrences outside of the southern California region, such as a maximum probable seismic event in the Delta that would cause levee failure and disruption of SWP deliveries. For greater detail on Metropolitan's planned responses to catastrophic interruption, please refer to Metropolitan's 2015 UWMP.

5.4.2 Water Emergency Response of Orange County

In 1983, the Orange County water community identified a need to develop a plan on how agencies would respond effectively to disasters impacting the regional water distribution system. The collective efforts of these agencies resulted in the formation of the Water Emergency Response Organization of Orange County (WEROC) to coordinate emergency response on behalf of all Orange County water and wastewater agencies, develop an emergency plan to respond to disasters, and conduct disaster training exercises for the Orange County water community. WEROC was established with the creation of an indemnification agreement between its member agencies to protect each other against civil liabilities and

to facilitate the exchange of resources. WEROC is unique in its ability to provide a single point of contact for representation of all water and wastewater utilities in Orange County during a disaster. This representation is to the county, state, and federal disaster coordination agencies. Within the Orange County Operational Area, WEROC is the recognized contact for emergency response for the water community, including the District.

5.4.3 El Toro Water District

The District relies on imported water for a majority of its supply. In the event of a supply interruption in the importation facilities, the District's, as well as most of South Orange County's, customers would be greatly impacted. The Metropolitan Administrative Policy requires its member agencies be able to withstand planned supply shutdowns of at least seven days between the months of October and April. This policy is designed to facilitate Metropolitan's ability to conduct scheduled maintenance of the supply and treatment systems.

The District's R-6 Reservoir was constructed in 1967 with a capacity of 223 million gallons and expanded in 2002 to 275 million gallons. After selling portion of its capacity to SMWD and MNWD, the District retains 124.5 million gallons of storage capacity in the R-6 Reservoir. The storage capacity contained in the R-6 Reservoir represents the bulk of the District's emergency storage. The District operates 5 tank type reservoirs with a combined 12 million gallons of storage capacity. However, they are operational reservoirs that are unlikely to be full in the event of an emergency. The time the District can withstand a supply outage would include both passive and direct curtailment. Passive curtailment assumes that the District's customers will enact voluntary conservation measures based on their knowledge of an on-going incident or crisis. A major shutdown will undoubtedly be accompanied by MWDOC and/or Metropolitan press releases and extensive media coverage. Direct demand curtailment would entail the physical disconnection of irrigation service in an effort to preserve the supply for health and safety requirements. The District maintains an inventory of meter locks that would be used to facilitate the interruption of service to large irrigation users in the event of a longer duration emergency interruption in service.

5.5 Prohibitions, Penalties and Consumption Reduction Methods

5.5.1 Prohibitions

The Water Conservation and Water Supply Shortage Ordinance No. 2015-3 lists water conservation requirements which shall take effect upon implementation by the Board of Directors. These prohibitions shall promote the efficient use of water, reduce or eliminate water waste, and enable implementation of the District's Water Shortage Contingency Measures. The prohibitions and the stages at which they take effect can be found in Table 5-3.

Table 5-3: Restrictions and Prohibitions on End Uses

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
Permanent Year-Round	Landscape - Limit landscape irrigation to specific times	Watering or irrigating of lawns, landscaping, and other vegetated areas are prohibited any day of the week between 10:00 a.m. and 5:00 p.m. This does not apply to watering with a hand-held bucket or similar container, watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle, or adjusting or repairing an irrigation system for very short periods of time.	No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawns, landscaping, and other vegetated areas that is not continuously attended to is limited to no more than fifteen (15) minutes per day per valve. This does not apply to irrigation systems that use very low-flow drip-type systems where no emitter discharges more than two (2) gallons of water per hour and systems equipped with sensor or weather-based controllers.	No
Permanent Year-Round	Landscape - Restrict or prohibit runoff from landscape irrigation		No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawns, landscaping, and other vegetated areas is prohibited during rain events and following 48 hours of significant precipitation.	No
Permanent Year-Round	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than five (5) days of District notification.	No
Permanent Year-Round	Other - Prohibit use of potable water for washing hard		No

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
	surfaces		
Permanent Year-Round	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	-	No
Permanent Year-Round	Water Features - Restrict water use for decorative water features, such as fountains	All decorative water fountains and features must recirculate water or users must secure a waiver from the District.	No
Permanent Year-Round	CII - Restaurants may only serve water upon request	-	No
Permanent Year-Round	CII - Lodging establishment must offer opt out of linen service	-	No
Permanent Year-Round	CII - Commercial kitchens required to use pre-rinse spray valves	-	No
Permanent Year-Round	Other	All new commercial car-wash and laundry facilities and systems must recirculate the wash water or secure a waiver of this requirement from the District.	No
Permanent Year-Round	Other	Buildings requesting new water service or that are being remodeled are prohibited from installing single-pass systems.	No

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	Landscape - Limit landscape irrigation to specific days	Watering or irrigating of lawns, landscaping, and other vegetated areas may only take place no more than three (3) days per week from April to October and no more than one (1) day per week from November to March. This does not apply to watering with a hand-held bucket or similar container, watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle, or irrigation systems that exclusively use very-low flow drip type systems where emitters discharge no more than two (2) gallons of water per hour.	Yes
2		Watering or irrigating of lawns, landscaping, and other vegetated areas may only take place no more than two (2) days per week from April to October and no more than one (1) day per week from November to March. This does not apply to watering with a hand-held bucket or similar container, watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle, or irrigation systems that exclusively use very-low flow drip type systems where emitters discharge no more than two (2) gallons of water per hour.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than three (3) days of District notification.	Yes
2	Other water feature or swimming pool restriction	Filling or refilling of ornamental lakes and ponds is prohibited except for those that sustain aquatic life provided that such life is of significant value and was actively managed in the water feature prior to declaring the shortage.	Yes
2	Other water feature or swimming pool	Filling residential swimming pools or outdoor spas is prohibited; refilling more than one (1) foot of water is prohibited. This does not apply	Yes

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
	restriction	to individuals who, due to health reasons or medical conditions, find it necessary to fill or refill their pools or spas or individuals who have not filled their pool in the last 24 months and who adhere to Best Practices for the construction and operation of pools and spas.	
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	-	Yes
3	Landscape - Prohibit all landscape irrigation	This does not apply towards the following circumstances: 1) maintenance of vegetation that are watered using a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, 2) maintenance of existing landscape necessary for fire protection, 3) maintenance of existing landscape for soil erosion, and 4) public works projects and actively-irrigated environmental mitigation projects.	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than two (2) days of District notification.	Yes
3	Other water feature or swimming pool restriction	Filling residential swimming pools or outdoor spas is prohibited; refilling more than one (1) foot of water is prohibited. This does not apply to individuals who, due to health reasons or medical conditions, find it necessary to fill or refill their pools or spas.	Yes
3	Other	No new potable water service, new temporary meters, and statement of immediate ability to serve or provide water service will be issued except under the following circumstances: 1) a	Yes

Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
		valid, unexpired building permit has been issued for the project, 2) the project is necessary to protect the public health, safety, and welfare, or the applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.	
NOTES:			

5.5.2 Penalties

Any customer who violates provisions of the Water Conservation and Water Supply Shortage Ordinance by either excess use of water or by specific violation of one or more of the applicable water use restrictions for a particular mandatory conservation stage may be cited by the District and may be subject to written notices, surcharges, fines, flow restrictions, service disconnection, and/or service termination.

During any of the Water Supply Shortage Levels, any water customer subject to water budgets who willfully use water in excess of their combined Tier I and Tier II water budgets shall be in violation of this Ordinance and, upon Board authorization and approval, will be subject to an Administrative Penalty in the range of $2.00 to $10.00 as determined by the Board for each ccf of water used in excess of their combined Tier I and Tier II water budgets.

Non-Compliance with Permanent, Level 1, or Level 2 Mandatory Conservation measures will result in the District issuing the violator a written warning and information regarding the necessity to comply with all Water Conservation Measures.

Non-Compliance with Level 3 Mandatory Conservation Measures will result in a written warning for the first instance of non-compliance. A second instance of non-compliance will result in a non-compliance charge on the water bill that is not to exceed two hundred and fifty dollars ($250). A third instance of non-compliance will result in a non-compliance charge on the water bill that is not to exceed five hundred dollars ($500). The District may also install a water flow restrictor device which would be in place for a minimum of forty-eight (48) hours following written notice of intent to the customer. The District may take further action to any non-compliance charges and disconnect and/or terminate a customer's water service, pursuant to Water Code 356. A person that is in non-compliance with this Ordinance is responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's schedule of charges then in effect (El Toro WD, Ordinance No.2015-03, June 2015).

5.5.3 Consumption Reduction Methods

Table 5-4 lists the consumption reduction methods that will be used to reduce water use in restrictive stages.

Table 5-4: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference
1	Other	Stage 1 Water Shortage Emergency Conservation Measures
2	Other	Stage 2 Water Shortage Emergency Conservation Measures
3	Other	Stage 3 Water Shortage Emergency Conservation Measures
NOTES:		

5.6 Impacts to Revenue

During a catastrophic interruption of water supplies, prolonged drought, or water shortage of any kind, the District will experience a reduction in revenue due to reduced water sales. Throughout this period of time, expenditures may increase or decrease with varying circumstances. Expenditures may increase in the event of significant damage to the water system, resulting in emergency repairs. Expenditures may also decrease as less water is pumped through the system, resulting in lower power costs.

The District receives water revenue from a service charge and a commodity charge based on consumption. The service charge recovers costs associated with providing water to the serviced property. The service charge does not vary with consumption and the commodity charge is based on water usage. Rates have been designed to recover the full cost of water service in the charges. Therefore, the total cost of purchasing water would decrease as the usage or sale of water decreases.

However, there are significant fixed costs associated with maintaining a minimal level of service. The District will monitor projected revenues and expenditures should an extreme shortage and a large reduction in water sales occur for an extended period of time. To overcome these potential revenue losses and/or expenditure impacts, the District may use reserves. If necessary, the District may reduce expenditures by delaying implementation of its Capital Improvement Program and equipment purchases, and/or adjust the work force, implement a drought surcharge, and/or make adjustments to its water rate structure.

5.7 Reduction Measuring Mechanism

This section includes mechanisms for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

- The District imports 100 percent of its water from the Metropolitan via MWDOC. All of the water entering the District's system is metered. The District has the ability to monitor system wide consumption on a daily basis. The District will be in a position to conduct daily monitoring of compliance with consumption reduction objectives.
- The District reads its meters monthly. Each month the District will assess compliance the appropriate conservation objective based on the declared shortage phase on an account by account basis.
- MWDOC will provide each client agency with water use monthly reports that will compare each client agency's current cumulative retail usage to their allocation baseline. MWDOC will also provide quarterly reports on it cumulative retail usage versus its allocation baseline.

In addition to metering consumption the District will conduct periodic monitoring and inspection of the system to verify compliance with the usage prohibitions defined in Ordinance 2015-03.

6 RECYCLED WATER

Recycled water opportunities have continued to grow in southern California as public acceptance and the need to expand local water resources continues to be a priority. Recycled water also provides a degree of flexibility and added reliability during drought conditions when imported water supplies are restricted.

Recycled water is wastewater that is treated through primary, secondary and tertiary processes and is acceptable for most non-potable water purposes such as irrigation, and commercial and industrial process water per Title 22 requirements.

6.1 Agency Coordination

There are a number of water agencies in south Orange County that provide potable water service as well as wastewater collection and treatment to recycled water standards. These agencies have been in the forefront of recycled water development to diversify water supplies because 1) they depend on imported water for the majority of their potable water supplies and 2) groundwater supplies are limited due to the local geography. Each of these agencies provides recycled water where feasible.

The District operates wastewater treatment facilities and is part of the regional South Orange County Wastewater Authority (SOCWA) as shown on Figure 6-1 and described in further detail below.

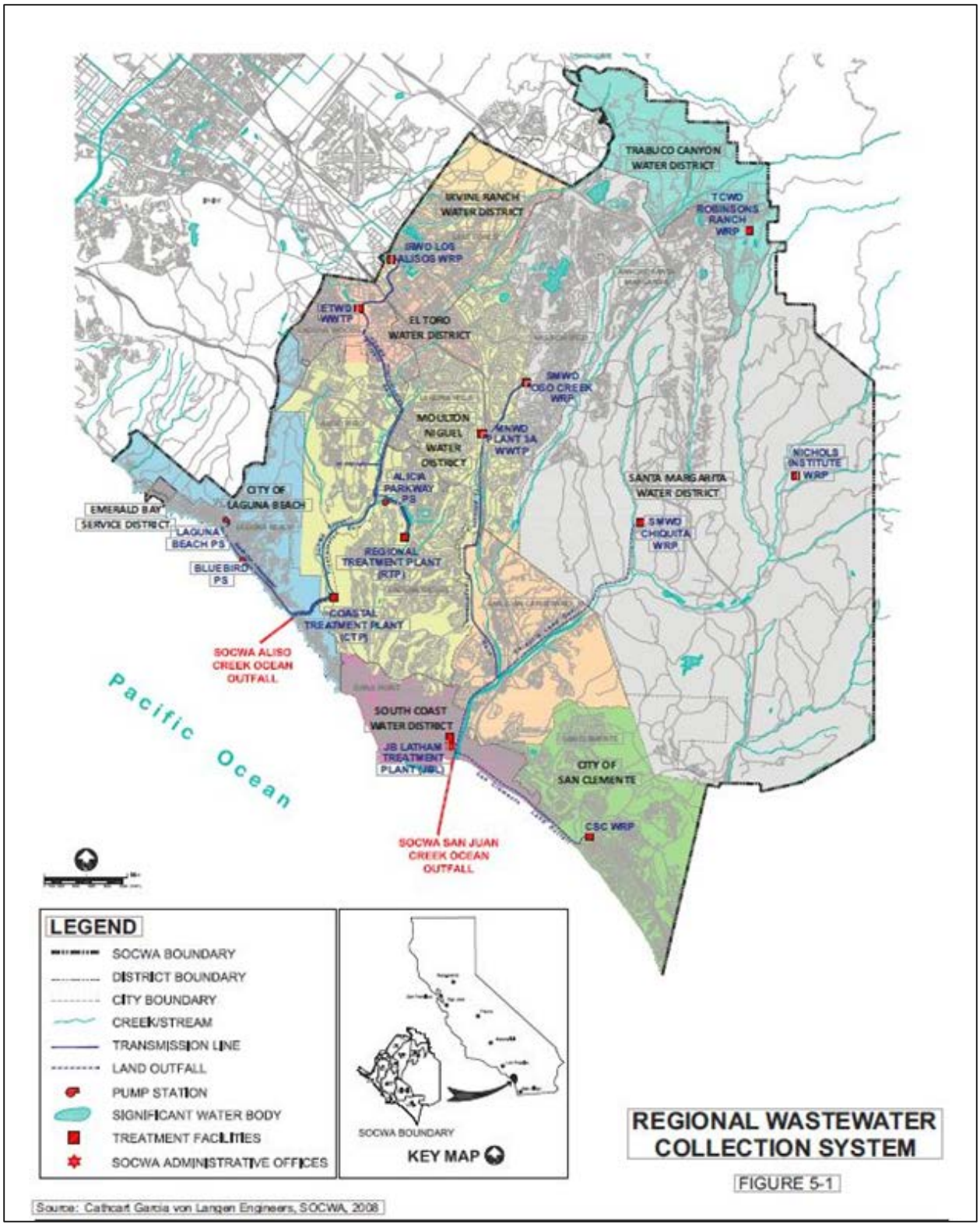


Figure 6-1: Neighboring Water Systems

6.2 Wastewater Description and Disposal

The District delivers approximately 7.5 MGD of potable water to customers' homes and businesses that generate approximately 3.8 MGD of wastewater. The District's wastewater collection system includes approximately 119 miles of sewer pipelines ranging from 4 inches to 24 inches in diameter and 11 sewer lift stations. Wastewater in the service area generally flows north to south and east to west.

Almost all of the wastewater generated within the District's service area is conveyed to its Water Recycling Plant (WRP) where it is treated and either used for irrigation or disposed of through SOCWA's effluent transmission main and ocean outfall. The District's WRP is located in Laguna Woods adjacent to the Laguna Woods Village Golf Course and serves portions of the Cities of Laguna Hills, Mission Viejo, Aliso Viejo, Lake Forest, and all of Laguna Woods. A small portion of flow on the southeast side of the District is conveyed directly to the MNWD collection system.

The WRP was originally constructed in 1963 to treat approximately 1.5 MGD. The plant has undergone several upgrades, and was largely reconstructed in 1998. The capacity of the facility under an average flow condition is approximately 5.4 MGD, but has the capacity treat a maximum flow of 6 MGD to secondary effluent standards. Effluent from the WRP is treated to secondary or tertiary levels depending on the disposal method, ocean outfall or beneficial reuse. Recycled water is treated to Title 22 standards with the expansion completed in 2014. Treated effluent that is not recycled is disposed of through the Aliso Creek Ocean Outfall.

Table 6-1 summarizes the wastewater collected by the District in 2015. Table 6-2 shows the amount of wastewater treated and disposed by the District.

Table 6-1: Wastewater Collected Within Service Area in 2015 (AF)

Retail: Wastewater Collected Within Service Area in 2015						
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	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?
El Toro Water District	Metered	4,235	El Toro Water District	Water Recycling Plant	Yes	No
Total Wastewater Collected from Service Area in 2015:		4,235				
NOTES:						

Table 6-2: Wastewater Treatment and Discharge within Service Area in 2015 (AF)

Retail: Wastewater Treatment and Discharge Within Service Area in 2015									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
ETWD	Aliso Creek Ocean Outfall	Laguna Beach	Ocean outfall	No	Secondary, Disinfected - 2.2	4,235	3,739	496	0
					Total	4,235	3,739	496	0
NOTES:									

6.3 Current Recycled Water Uses

Construction of the District's Recycled Water Expansion Project (Phase I) was completed in November 2014. The $34 million project constructed over 100,000 linear feet of recycled water distribution pipelines and a 3.7 MGD tertiary treatment facility at the District's WRP that meets Title 22 requirements for landscape irrigation. The plant was designed with the ability to expand capacity up to the expected maximum amount of raw wastewater entering the plant. The project includes the conversion of 216 existing dedicated irrigation meters in the Cities of Laguna Woods and Laguna Hills from potable water to recycled water. As of April 2016, the District has completed over 95 percent of the meter conversions and expects to complete the final retrofits by mid-2016. The Phase I project will result in the conversion of approximately 950 AFY from potable water to recycled water.

In the tertiary treatment process, secondary treated effluent flows through cloth media disc filters. The cloth media traps solids and debris, while the filtered water flows into a basin where chlorine is injected for disinfection. Chlorine disinfection further polishes and removes viruses and pathogens. The chlorine infused water travels through a series of baffled channels to ensure compliance with chlorine contact time requirements. The tertiary treated water is then ready to be pumped into the recycled water irrigation distribution system. The District's recycled water distribution system consists of 19 miles of pipeline that range in between 4 inches and 20 inches in diameter.

The District puts approximately 11.7 percent of their wastewater to beneficial use that is treated at the WRP. The recycled water is primarily used for irrigation of the Laguna Woods Village Golf Course, irrigation on the WRP grounds, and as process water at the WRP. The District continues to investigate options for expanding the distribution of recycled water to its customers as well as other agencies in the region.

In FY 2014-15, an average of 3.3 MGD of secondary treated effluent was disposed via the SOCWA Effluent Transmission Main to the Aliso Creek Ocean Outfall and 0.44 MGD of secondary effluent was treated to tertiary standards and sent to the recycled water distribution system.

Table 6-3 below illustrates the current and projected uses for recycled water in the District. The usage is limited to landscape irrigation and in-plant uses at WRP, designated in the Table as industrial.

Table 6-3: Current and Projected Recycled Water Direct Beneficial Use within Service Area (AF)

Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area							
Name of Agency Producing (Treating) the Recycled Water:	ETWD						
Name of Agency Operating the Recycled Water Distribution System:	ETWD						
Beneficial Use Type	Level of Treatment	2015	2020	2025	2030	2035	2040
Agricultural irrigation							
Landscape irrigation (excludes golf courses)	Tertiary	75	251	251	251	251	251
Golf course irrigation	Secondary, Disinfected - 2.2	135	0	0	0	0	0
Golf course irrigation	Tertiary	215	1,170	1,170	1,170	1,170	1,170
Commercial use	Secondary, Disinfected - 2.2	5	0	0	0	0	0
Commercial use	Tertiary	66	239	239	239	239	239
Industrial use							
Geothermal and other energy production							
Seawater intrusion barrier							
Recreational impoundment							
Wetlands or wildlife habitat							
Groundwater recharge (IPR)*							
Surface water augmentation (IPR)*							
Direct potable reuse							
Other *(Provide General Description)*							
	Total:	496	1,660	1,660	1,660	1,660	1,660
**IPR - Indirect Potable Reuse*							
NOTES:							

The projected 2015 recycled water use from the District's 2010 UWMP was compared to the 2015 actual recycled water use as shown in Table 6-4. Recycled water for 2015 was projected higher in the 2010 UWMP than the actual recycled water use in 2015.

Table 6-4: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (AF)

Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual			
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation			
Landscape irrigation (excludes golf courses)		775	75
Golf course irrigation		425	350
Commercial use			72
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		1,200	496
NOTES:			

6.4 Potential Recycled Water Uses

The District has completed 90 percent design of the Phase II Recycled Water Distribution System Expansion Project (Phase II Project) and is described in further detail in Section 7.3. These expected increase in recycled water use is shown in Table 6-5.

Table 6-5: Methods to Expand Future Recycled Water Use

Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Phase II Project	Expand recycled water distribution system	2018	270
		Total	270
NOTES:			

6.4.1 Direct Non-Potable Reuse

The District currently uses water from their recycled water system for direct non-potable reuse such as landscape irrigation and commercial use.

6.4.2 Indirect Potable Reuse

The District does not have the potential for indirect potable reuse (IPR) within their service area. However, the District is willing to discuss and potentially participate in any regional opportunities for IPR.

6.5 Optimization Plan

In Orange County, the majority of recycled water is used for irrigating golf courses, parks, schools, businesses, and communal landscaping. Future recycled water use can be increased by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pump stations and transmission pipelines to reach areas that are further from treatment plants. Gains in implementing some of these projects have been made throughout the county. However, additional costs, large energy requirements, and capital costs for facilities all contribute to the high costs of such projects.

In order to determine if additional projects are feasible, studies must be performed to determine if the project should be pursued. Feasibility studies should include evaluation of alternatives with a present worth analysis consisting of capital costs (design, environmental reviews, construction, etc.) and operations and maintenance costs (electrical costs for pumps and equipment and maintenance required for the system).

The District will continue to conduct feasibility studies for recycled water and seek out creative solutions such as funding, regulatory requirements, institutional arrangement and public acceptance for recycled water use with MWDOC, Metropolitan and other cooperative agencies.

7 FUTURE WATER SUPPLY PROJECTS AND PROGRAMS

7.1 Water Management Tools

Resource optimization such as desalination minimize the District's and region's reliance on imported water. Optimization efforts are typically led by regional agencies in collaboration with local/retail agencies.

With the aforementioned improvements in the water recycling process, along with conservation efforts, the District can optimize its facilities and more effectively meet projected demands.

7.2 Transfer or Exchange Opportunities

Interconnections with other agencies result in the ability to share water supplies during short term emergency situations or planned shutdowns of major imported water systems. The District maintains interconnections with other agencies as follows:

- TCWD at Cranbridge Dr. and Bridgemont Rd.
- IRWD at El Toro Rd. and Aliso Park Dr.
- IRWD at Ridge Route Dr. and Muirlands Blvd.
- IRWD at El Toro Rd. And Cornelius Dr.
- MNWD at Los Alisos Blvd, NE of Jeronimo Rd.
- SMWD at Trabuco Rd. and SMWD boundary
- IRWD at Second St. and Cherry Ave.
- SMWD/Aufdenkamp Connection Transmission Main at Ridge Route Dr. and Peralta Dr.
- MNWD at Beckenham St. and Wilkes Pl.
- MNWD at Los Alisos Blvd and Via Pimiento
- MNWD at Muirlands Blvd. and La Paz Rd.
- LBCWD at Avenida Sosiega West and Luz Del Sol
- Joint Regional Water Supply System/Tri-Cities Transmission Main at Moulton Pkwy, NW of El Toro Rd.

MWDOC continues to help its retail agencies develop transfer and exchange opportunities that promote reliability within their systems. Therefore, MWDOC will look to help its retail agencies navigate the operational and administrative issues of transfers within the Metropolitan distribution system. Currently, there are no transfer or exchange opportunities.

7.3 Planned Water Supply Projects and Programs

The District identified planned design and construction projects as described below.

Recycled Water Expansion Phase II – The District has completed 90 percent design of the Phase II Recycled Water Distribution System Expansion Project (Phase II). The Phase II Project will construct 28,000 linear feet of recycled water distribution pipelines. The $12 million project will result in the conversion of approximately 270 AFY of dedicated irrigation demand from potable water to recycled water. The project is expected to begin construction in early 2017 and be operational by mid-2018.

Recycled Water Expansion Phase III – The District is in the process of completing a conceptual level study that would potentially convert up to 300 AFY of dedicated irrigation demand from potable water to recycled water on the East Side of the Interstate 5 freeway.

MNWD Master Plan – The District is currently participating in the MNWD Recycled Water Master Plan. The Master Plan will evaluate potential options for the District and MNWD to collaborate on mutually beneficial recycled water projects. One potential project would enable the District to distribute recycled water through the MNWD system to serve recycled water customers in the District's service area. Upon completion of the MNWD Master Plan the District will evaluate the feasibility of any potential project alternatives developed in the Master Plan effort.

Baker Water Treatment Plant – The Baker Water Treatment Plant is a new drinking water treatment plant to be located at the existing Baker Filtration Plant in the City of Lake Forest. This plant will have a capacity of 28.1 MGD and is a joint regional project that will increase the reliable drinking water supply for the District, IRWD, MNWD, SMWD, and TCWD during emergencies and extended facility shutdowns and will provide operational flexibility. The plant will treat raw, imported water from Metropolitan and local surface water from Irvine Lake using advanced microfiltration and ultraviolet disinfection, resulting in high quality drinking water that exceeds current regulatory requirements. Construction is underway and is expected to be completed in late 2016. The District's plant capacity ownership equates to approximately 5 cfs (3,600 AFY) if supply is available and capacity fully used. A location map of the Baker Treatment Plant and surrounding agencies is provided on Figure 7-1.

Figure 7.1 Baker Treatment Plant Location Map

7.4 Desalination Opportunities

In 2001, Metropolitan developed a Seawater Desalination Program (SDP) to provide incentives for developing new seawater desalination projects in Metropolitan's service area. In 2014, Metropolitan

modified the provisions of their Local Resources Program (LRP) to include incentives for locally produced seawater desalination projects that reduce the need for imported supplies. To qualify for the incentive, proposed projects must replace an existing demand or prevent new demand on Metropolitan's imported water supplies. In return, Metropolitan offers two incentive formulas under the program:

- Up to $340 per AF for 25 years, depending on the unit cost of seawater produced compared to the cost of Metropolitan supplies
- Up to $475 per AF for 15 years, depending on the unit cost of seawater produced compared to the cost of Metropolitan supplies

Developing local supplies within Metropolitan's service area is part of their IRP goal of improving water supply reliability in the region. Creating new local supplies reduce pressure on imported supplies from the SWP and Colorado River.

On May 6th, 2015, the SWRCB approved an amendment to the state's Water Quality Control Plan for the Ocean Waters of California (California Ocean Plan) to address effects associated with the construction and operation of seawater desalination facilities (Desalination Amendment). The amendment supports the use of ocean water as a reliable supplement to traditional water supplies while protecting marine life and water quality. The California Ocean Plan now formally acknowledges seawater desalination as a beneficial use of the Pacific Ocean and the Desalination Amendment provides a uniform, consistent process for permitting seawater desalination facilities statewide.

If the following projects are developed, Metropolitan's imported water deliveries to Orange County could be reduced. These projects include the Huntington Beach Seawater Desalination Project, the Doheny Desalination Project, and the Camp Pendleton Seawater Desalination Project.

The District is considering the opportunity to receive 1 MGD from the Huntington Beach Seawater Desalination Project.

Brackish groundwater is groundwater with a salinity higher than freshwater, but lower than seawater. Brackish groundwater typically requires treatment using desalters.

7.4.1 Groundwater

There are currently no brackish groundwater opportunities within the District's service area.

7.4.2 Ocean Water

Huntington Beach Seawater Desalination Project – Poseidon Resources LLC (Poseidon), a private company, is developing the Huntington Beach Seawater Desalination Project to be co-located at the AES Power Plant in the City of Huntington Beach along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 MGD (56,000 AFY) of drinking water to provide approximately 10 percent of Orange County's water supply needs.

Over the past several years, Poseidon has been working with Orange County Water District (OCWD) on the general terms and conditions for selling the water to OCWD. OCWD and MWDOC have proposed a few distribution options to agencies in Orange County. The northern option proposes the water be distributed to the northern agencies closer to the plant within OCWD's service area with the possibility of

recharging/injecting a portion of the product water into the OC Groundwater Basin. The southern option builds on the northern option by delivering a portion of the product water through the existing OC-44 pipeline for conveyance to the south Orange County water agencies. A third option is also being explored that includes all of the product water to be recharged into the OC Groundwater Basin. Currently, a combination of these options could be pursued.

OCWD's current Long-Term Facilities Plan (LTFP) identifies the Huntington Beach Seawater Desalination project as a priority project and determined the plant capacity of 56,000 AFY as the single largest source of new, local drinking water available to the region. In addition to offsetting imported demand, water from this project could provide OCWD with management flexibility in the OC Groundwater Basin by augmenting supplies into the Talbert Seawater Barrier to prevent seawater intrusion.

In May 2015, OCWD and Poseidon entered into a Term Sheet that provided the overall partner structure in order to advance the project. Based on the initial Term Sheet, Poseidon would be responsible for permitting, financing, design, construction, and operations of the treatment plant while OCWD would purchase the production volume, assuming the product water quality and quantity meet specific contract parameters and criteria. Furthermore, OCWD would then distribute the water in Orange County using one of the proposed distribution options described above.

Currently, the project is in the late-stages of the regulatory permit approval process and Poseidon hopes to obtain the last discretionary permit necessary to construct the plant from the California Coastal Commission (CCC) in 2016. If the CCC permit is obtained, the plant could be operational as early as 2019.

Doheny Desalination Project – In 2013, after five years and $6.2 million to investigate use of a slant well intake for the Doheny Desalination Project, it was concluded the project was feasible and could produce 15 MGD (16,800 AFY) of new potable water supplies to five participating agencies. These agencies consist of: SCWD, City of San Clemente, City of San Juan Capistrano, LBCWD and Moulton Niguel Water District.

Only SCWD and LBCWD expressed interest in moving forward after work was completed, with the other agencies electing to monitor the work and consider options to subsequently come back into the project while considering other water supply investments.

More recently, LBCWD has had success in using previously held water rights in the OC groundwater basin and may elect to move forward with that project instead of ocean desalination. A final decision is pending based on securing the necessary approvals on the groundwater agreement.

SCWD has taken the lead on the desalination project and has hired a consulting team to proceed with project development for the Doheny Desalination Project. Major items scheduled over the next year include:

- Preliminary Design Report and Cost Estimate
- Brine Outfall Analysis
- Environmental Impact Report (EIR) Process
- Environmental Permitting Approvals
- Public Outreach

- Project Funding
- Project Delivery Method
- Economic Analysis

The schedule for this project includes start-up and operation of up to a 5 MGD (5,600 AFY) facility by the end of 2019. SCWD anticipates leaving the option open for other agencies to participate in a larger, 15 MGD facility, with subsequent permitting and construction of additional slant wells and treatment capacity.

Camp Pendleton Seawater Desalination Project – San Diego County Water Authority (SDCWA) is studying a desalination project to be located at the southwest corner of Camp Pendleton Marine Corps Base adjacent to the Santa Margarita River. The initial project would be a 50 (56,000 AFY) or 100 (112,100) MGD plant with expansions in 50 MGD increments to a maximum capacity of 150 MGD (168,100 AFY), making this the largest proposed desalination plant in the US.

The project is currently in the feasibility study stage and SDCWA is conducting geological surveys, analyzing intake options, and studying the effect on ocean life and routes to bring desalinated water to SDCWA's delivery system. MWDOC and south Orange County agencies are maintaining an interest in the project.

8 UWMP ADOPTION PROCESS

Recognizing that close coordination among other relevant public agencies is key to the success of its UWMP, the District worked closely with entities such as MWDOC to develop and update this planning document. The District also encouraged public involvement by holding a public hearing for residents to learn and ask questions about their water supply.

This section provides the information required in Article 3 of the Water Code related to adoption and implementation of the UWMP. Table 8-1 summarizes external coordination and outreach activities carried out by the District and their corresponding dates. The UWMP checklist to confirm compliance with the Water Code is provided in Appendix A.

Table 8-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Encouraged public involvement (Public Hearing Notice)	5/12/16 & 5/19/16	Appendix D
Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	3/16/16 & 3/29/16	Appendix D
Held public hearing	5/26/16	Appendix D
Adopted UWMP	5/26/16	Appendix E
Submitted UWMP to DWR	7/1/16	-
Submitted UWMP to the California State Library and city or county within the supplier's service area	8/1/16	-
Made UWMP available for public review (no later than 30 days after filing with DWR)	8/1/16	-

This UWMP was adopted by the Board of Directors on May 26, 2016. A copy of the adopted resolution is provided in Appendix E.

A change from the 2004 legislative session to the 2009 legislative session required the District to notify any city or county within its service area at least 60 days prior to the public hearing. As shown in Table 8-2, the District sent a Letter of Notification to the County of Orange and cities within its service area on March 16, 2016 and March 29, 2016 to state that it was in the process of preparing an updated UWMP (Appendix D).

Table 8-2: Notification to Cities and Counties

Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Laguna Woods	☑	☑
Lake Forest	☑	☑
Aliso Viejo	☑	☑
Laguna Hills	☑	☑
Mission Viejo	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Orange County	☑	☑
NOTES:		

8.1 Public Participation

The District encouraged community and public interest involvement in the plan update through public hearings and inspection of the draft document. Public hearing notifications were published pursuant to Section 6066 of the Government Code. A copy of the published Notice of Public Hearing is included in Appendix D. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to the District's plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the District's offices and local Public Libraries. Public hearings are scheduled were held on May 26, 2016 for plan discussion and May 26, 2016 for plan review and adoption.

8.2 Agency Coordination

The District's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. The District is dependent on imported water from Metropolitan through MWDOC, its regional wholesaler. The District involved water providers in the development of its 2015 UWMP at various levels of contribution.

As the District is a member agency of MWDOC, MWDOC provided assistance to the District's 2015 UWMP development by providing much of the data and analysis such as population projections, demand projections, and SBx7-7 modeling. The District's UWMP was developed in collaboration with MWDOC's

2015 RUWMP to ensure consistency between the two documents as well as Metropolitan's 2015 RUWMP and 2015 Integrated Water Resources Plan.

8.3 UWMP Submittal

8.3.1 Review of 2010 UWMP Implementation

As required by California Water Code, the District summarized Water Conservation Programs implemented to date, and compared them to those planned in its 2010 UWMP.

8.3.2 Comparison of 2010 Planned Water Conservation Programs with 2015 Programs

As a signatory to the MOU regarding urban water use efficiency, the District's commitment to implement BMP-based water use efficiency program continues today. For the District's specific achievements in the area of conservation, please see Section 4 of this Plan.

8.3.3 Comparison of 2010 Projected Recycled Water Use with 2015 Actual Use

Current recycled water projections for the District in 2015 are about 59 percent less than previously forecasted for 2015 in the 2010 UWMP, as illustrated in Table 6-4.

8.3.4 Filing of 2015 UWMP

The Board of Directors reviewed the Final Draft Plan on May 26, 2016. The five-member Board of Directors approved the 2015 UWMP on May 26, 2016. See Appendix E for the resolution approving the Plan.

By July 1, 2016, the District's Adopted 2015 UWMP was filed with DWR, California State Library, County of Orange, and cities within its service area.

REFERENCES

California Department of Water Resources, 2015. Urban Water Management Plans, Guidebook for Urban Water Suppliers.

CDM Smith, 2016. Final Technical Memorandum #1 of Orange County Reliability Study.

Department of Water Resources, 2015. State Water Project Final Delivery Capability Report 2015.

El Toro Water District, 2015, 5-Year Capital Improvement Plan.

El Toro Water District, California, Water and Sewer Master Plan.

El Toro Water District, California, Water Supply Shortage Ordinance 2015-3, (2015).

Metropolitan Water District of Southern California, 2016. Metropolitan Urban Water Management Plan 2015.

Municipal Water District of Orange County, 2015. Orange County Reliability Study.

Municipal Water District of Orange County, 2015. Water Shortage Allocation Model.

San Diego County Water Authority, 2003. Quantification Settlement Agreement.

Southern California Association of Governments, 2012. 5th Cycle Regional Housing Needs Assessment Final Allocation Plan.

U.S. Department of the Interior Bureau of Reclamation, 2012. Colorado River Basin Study.

Urban Water Management Planning Act, California Water Code § 10610-10656 (2010).

Water Conservation Act of 2009, California Senate SB x7-7, 7th California Congress (2009).

Water Systems Optimization, 2016. California Department of Water Resources: Water Audit Manual.

APPENDIX A

UWMP Checklist

UWMP Checklist

This checklist is developed directly from the Urban Water Management Planning Act and SB X7-7. It is provided to support water suppliers during preparation of their UWMPs. Two versions of the UWMP Checklist are provided – the first one is organized according to the California Water Code and the second checklist according to subject matter. The two checklists contain duplicate information and the water supplier should use whichever checklist is more convenient. In the event that information or recommendations in these tables are inconsistent with, conflict with, or omit the requirements of the Act or applicable laws, the Act or other laws shall prevail.

Each water supplier submitting an UWMP can also provide DWR with the UWMP location of the required element by completing the last column of eitherchecklist. This will support DWR in its review of these UWMPs. The completed form can be included with the UWMP.

If an item does not pertain to a water supplier, then state the UWMP requirement and note that it does not apply to the agency. For example, if a water supplier does not use groundwater as a water supply source, then there should be a statement in the UWMP that groundwater is not a water supply source.

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	**Section 1.1**
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	**Section 8.2**
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	**Section 8.1**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Section 1.3.1**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 2.2.1**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Section 2.2.2**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 2.2.2**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Section 2.2.2**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 2.3.1 and 2.4.3**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Section 2.3.4 and Appendix H**
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	**Section 2.4.5**
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	**Section 2.5.2**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and	Baselines and Targets	Chapter 5 and App E	**Section 2.5.2.2**

	compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
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	**Section 2.5.2.2**
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Section 2.5.2.2**
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	**Section 2.5.2.2**
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	**N/A**
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	**Section 2.5.2.2**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Section 3.4**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 3.3**
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	**N/A**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**N/A**
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	**N/A**
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	**N/A**
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of	System Supplies	Section 6.2.4	**N/A**

	groundwater pumped by the urban water supplier for the past five years			
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	**N/A**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Section 7.2**
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	**Section 7**
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Section 7.4**
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	**Section 3.4 & Table 1-4**
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	**N/A**
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	**Section 6.1**
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	**Section 6.2**
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	**Section 6.2**
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	**Section 6.3**
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	**Section 6.4**
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	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.3**

	comparison to uses previously projected.			
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	**Section 6.4**
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	**Section 6.5**
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	**Section 7.1**
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	**Section 3.6**
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	**Section 3.6.5**
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	**Section 3.6**
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	**Section 3.6.2.3**
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	**Section 3.6**
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	**Section 5.2**
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	**Section 5.3**
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	**Section 5.4**
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Section 5.5.1**
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Section 5.5.3**
10632(a)(6)	Indicated penalties or charges for excessive	Water Shortage Contingency	Section 8.3	**Section**

	use, where applicable.	Planning		**5.5.2**
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	**Section 5.6**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Appendix D**
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	**Section 5.7**
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	**Section 4**
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	**N/A**
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	**Section 4 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	**Section 8.1**
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	**Appendix E**
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	**Section 8.3.4**
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	**Section 8.3.4**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Section 8.1**

	public hearing, and held a public hearing about the plan.			
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	**Appendix E**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Appendix F**
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	**Section 8.3.4**
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	**Section 8.3.4**
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	**Section 8.3.4**
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**	**Section 8**

APPENDIX B

Standardized Tables

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
CA3010079	El Toro Water District	9,818	9,145
	TOTAL	9,818	9,145
NOTES:			

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☐	UWMP Tables Are in Calendar Years
☑	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
7/1	
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.
MWDOC
NOTES:

Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
	48,797	52,743	52,750	53,225	53,245	53,196
NOTES: Center for Demographic Research, California State University, Fullerton						

Table 4-1 Retail: Demands for Potable and Raw Water - Actual		
Use Type *(Add additional rows as needed)*	2015 Actual	
Use Drop down list *May select each use multiple times* *These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Level of Treatment When Delivered *Drop down list*	Volume
Single Family	Drinking Water	2,139
Multi-Family	Drinking Water	2,973
Institutional/Governmental	Drinking Water	57
Industrial	Drinking Water	1,021
Landscape	Drinking Water	2,234
Losses	Drinking Water	225
	TOTAL	8,649
NOTES: Data retrieved from ETWD's billing records.		

Table 4-2 Retail: Demands for Potable and Raw Water - Projected					
Use Type *(Add additional rows as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
Use Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	2020	2025	2030	2035	2040
Single Family	1,647	1,829	1,836	1,809	1,802
Multi-Family	2,290	2,542	2,552	2,514	2,504
Institutional/Governmental	44	49	49	48	48
Industrial	786	873	876	864	860
Landscape	1,721	1,910	1,917	1,889	1,882
Losses	173	192	193	190	190
TOTAL	6,661	7,394	7,423	7,315	7,285
NOTES: Data retrieved from ETWD's billing records.					

Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water *From Tables 4-1 and 4-2*	8,649	6,661	7,394	7,423	7,315	7,285
Recycled Water Demand* *From Table 6-4*	496	1,660	1,660	1,660	1,660	1,660
TOTAL WATER DEMAND	9,145	8,321	9,054	9,083	8,975	8,945
NOTES:						

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2015	376
NOTES:	

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	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 4.1
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	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	*1996*	*2005*	*204*	*183*	*163*
5 Year	*2004*	*2008*	*202*		

*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*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
158	183	Yes
**All values are in Gallons per Capita per*		
NOTES:		

Table 6-1 Retail: Groundwater Volume Pumped	
☑	Supplier does not pump groundwater. The supplier will not complete the table below.

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
ETWD	Metered	4,235	ETWD	WRP	Yes	No
Total Wastewater Collected from Service Area in 2015:		4,235				
NOTES:						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level *Drop down list*	2015 volumes			
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
ETWD	Aliso Creek Ocean Outfall	Laguna Beach	Ocean outfall	No	Secondary, Disinfected - 2.2	4,235	3,739	496	0
					Total	4,235	3,739	496	0
NOTES:									

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area							
Name of Agency Producing (Treating) the Recycled	ETWD						
Name of Agency Operating the Recycled Water	ETWD						
Beneficial Use Type *These are the only Use Types that will be recognized by the DWR online submittal tool*	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040
Agricultural irrigation							
Landscape irrigation (excludes golf courses)	Tertiary	75	251	251	251	251	251
Golf course irrigation	Secondary, Disinfected - 2.2	135	0	0	0	0	0
Golf course irrigation	Tertiary	215	1,170	1,170	1,170	1,170	1,170
Commercial use	Secondary, Disinfected - 2.2	5	0	0	0	0	0
Commercial use	Tertiary	66	239	239	239	239	239
Industrial use							
Geothermal and other energy production							
Seawater intrusion barrier							
Recreational impoundment							
Wetlands or wildlife habitat							
Groundwater recharge (IPR)*							
Surface water augmentation (IPR)*							
Direct potable reuse							
Other *(Provide General Description)*							
	Total:	496	1,660	1,660	1,660	1,660	1,660
**IPR - Indirect Potable Reuse*							
NOTES:							

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			
Landscape irrigation (excludes golf courses)		775	75
Golf course irrigation		425	350
Commercial use			72
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		1,200	496
NOTES:			

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Phase II Project	Distribution System Expansion	2018	270
		Total	270
NOTES:			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs	
☐	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.
☑	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.
Section 7.3	Provide page location of narrative in the UWMP

Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
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*		Actual Volume	Water Quality *Drop Down List*
Purchased or Imported Water	MWDOC	8,649	Drinking Water
Recycled Water		496	Recycled Water
	Total	9,145	
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**
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	MWDOC	6,661	7,394	7,423	7,315	7,285
Recycled Water		1,660	1,660	1,660	1,660	1,660
	Total	8,321	9,054	9,083	8,975	8,945
NOTES:						

Table 7-1 Retail: Basis of Water Year Data			
Year Type	**Base Year** *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*	**Available Supplies if Year Type Repeats**	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	**% of Average Supply**
Average Year	1990-2014		100%
Single-Dry Year	2014		109%
Multiple-Dry Years 1st Year	2012		109%
Multiple-Dry Years 2nd Year	2013		109%
Multiple-Dry Years 6th Year *Optional*	2014		109%
NOTES:			

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals *(autofill from Table 6-9)*	8,321	9,054	9,083	8,975	8,945
Demand totals *(autofill from Table 4-3)*	8,321	9,054	9,083	8,975	8,945
Difference	0	0	0	0	0
NOTES:					

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	9,070	9,869	9,900	9,783	9,750
Demand totals	9,070	9,869	9,900	9,783	9,750
Difference	0	0	0	0	0
NOTES: Developed by MWDOC as 2015 Bump Methodology					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	9,070	9,869	9,900	9,783	9,750
	Demand totals	9,070	9,869	9,900	9,783	9,750
	Difference	0	0	0	0	0
Second year	Supply totals	9,070	9,869	9,900	9,783	9,750
	Demand totals	9,070	9,869	9,900	9,783	9,750
	Difference	0	0	0	0	0
Third year	Supply totals	9,070	9,869	9,900	9,783	9,750
	Demand totals	9,070	9,869	9,900	9,783	9,750
	Difference	0	0	0	0	0
NOTES: Developed by MWDOC as 2015 Bump Methodology						

Table 8-1 Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description)*
1	Up to 20%	A Level 1 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during whic, at its sole discretion, determines and declares that a further additional reduction in consumer demand is necessary due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions.
2	Up to 40%	A Level 2 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during whic, at its sole discretion, determines and declares that a further additional reduction in consumer demand is necessary due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions.
3	Greater than 40%	A Level 3 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during whic, at its sole discretion, determines and declares that a further additional reduction in consumer demand is necessary due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions.
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES:		

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Permanent Year-Round	Landscape - Limit landscape irrigation to specific times	Watering or irrigating of lawns, landscaping, and other vegetated areas are prohibited any day of the week between 10:00 a.m. and 5:00 p.m. This does not apply to watering with a hand-held bucket or similar container, watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle, or adjusting or repairing an irrigation system for very short periods of time.	No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawns, landscaping, and other vegetated areas that is not continuously attended to is limited to no more than fifteen (15) minutes per day per valve. This does not apply to irrigation systems that use very low-flow drip-type systems where no emitter discharges more than two (2) gallons of water per hour and systems equipped with sensor or weather-based controllers.	No
Permanent Year-Round	Landscape - Restrict or prohibit runoff from landscape irrigation		No
Permanent Year-Round	Landscape - Other landscape restriction or prohibition	Watering or irrigating of lawns, landscaping, and other vegetated areas is prohibited during rain events and following 48 hours of significant precipitation.	No
Permanent Year-Round	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than five (5) days of District notification.	No
Permanent Year-Round	Other - Prohibit use of potable water for washing hard surfaces		No
Permanent Year-Round	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		No
Permanent Year-Round	Water Features - Restrict water use for decorative water features, such as fountains	All decorative water fountains and features must recirculate water or users must secure a waiver from the District.	No
Permanent Year-Round	CII - Restaurants may only serve water upon request		No
Permanent Year-Round	CII - Lodging establishment must offer opt out of linen service		No
Permanent Year-Round	CII - Commercial kitchens required to use pre-rinse spray valves		No

Permanent Year-Round	Other	All new commercial car-wash and laundry facilities and systems must recirculate the wash water or secure a waiver of this requirement from the District.	No
Permanent Year-Round	Other	Buildings requesting new water service or that are being remodeled are prohibited from installing single-pass systems.	No
1	Landscape - Limit landscape irrigation to specific days	Watering or irrigating of lawns, landscaping, and other vegetated areas may only take place no more than three (3) days per week from April to October and no more than one (1) day per week from November to March. This does not apply to watering with a hand-held bucket or similar container, watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle, or irrigation systems that exclusively use very-low flow drip type systems where emitters discharge no more than two (2) gallons of water per hour.	Yes
2		Watering or irrigating of lawns, landscaping, and other vegetated areas may only take place no more than two (2) days per week from April to October and no more than one (1) day per week from November to March. This does not apply to watering with a hand-held bucket or similar container, watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle, or irrigation systems that exclusively use very-low flow drip type systems where emitters discharge no more than two (2) gallons of water per hour.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than three (3) days of District notification.	Yes
2	Other water feature or swimming pool restriction	Filling or refilling of ornamental lakes and ponds is prohibited except for those that sustain aquatic life provided that such life is of significant value and was actively managed in the water feature prior to declaraing the shortage.	Yes

2	Other water feature or swimming pool restriction	Filling residential swimming pools or outdoor spas is prohibited; refilling more than one (1) foot of water is prohibited. This does not apply to individuals who, due to health reasons or medical conditions, find it necessary to fill or refill their pools or spas or individuals who have not filled their pool in the last 24 months and who adhere to Best Practices for the construction and operation of pools and spas.	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
3	Landscape - Prohibit all landscape irrigation	This does not apply towards the following circumstances: 1) maintenance of vegetation that are watered using a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, 2) maintenance of existing landscape necessary for fire protection, 3) maintenance of existing landscape for soil erosion, and 4) public works projects and actively-irrigated environmental mitigation projects.	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks, breaks, and other malfunctions must be corrected in no more than two (2) days of District notification.	Yes
3	Other water feature or swimming pool restriction	Filling residential swimming pools or outdoor spas is prohibited; refilling more than one (1) foot of water is prohibited. This does not apply to individuals who, due to health reasons or medical conditions, find it necessary to fill or refill their pools or spas.	Yes

3	Other	No new potable water service, new temporary meters, and statement of immediate ability to serve or provide water service will be issued except under the following circumstances: 1) a valid, unexpired building permit has been issued for the project, 2) the project is necessary to protect the public health, safety, and welfare, or the applicant provides substantial evidence of an enforceable commitment thatw ater demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.	Yes
NOTES:			

Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*
1	Other	Stage 1 Water Shortage Emergency Conservation Measures
2	Other	Stage 2 Water Shortage Emergency Conservation Measures
3	Other	Stage 3 Water Shortage Emergency Conservation Measures
NOTES:		

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	9,595	9,595	9,595
NOTES:			

Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Laguna Woods	☑	☑
Lake Forest	☑	☑
Aliso Viejo	☑	☑
Laguna Hills	☑	☑
Mission Viejo	☑	☑
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Orange County	☑	☑
NOTES:		

APPENDIX C

District Ordinance

EL TORO WATER DISTRICT

WATER CONSERVATION & WATER SUPPLY SHORTAGE ORDINANCE 2015 – 3

(effective June 9, 2015)

Table of Contents

ORDINANCE NO. 2015 - 3

AN ORDINANCE OF THE BOARD OF DIRECTORS OF EL TORO WATER DISTRICT ESTABLISHING A WATER CONSERVATION & WATER SUPPLY SHORTAGE PROGRAM FOR USERS OF POTABLE WATER PROVIDED BY THE DISTRICT

Section I. Title

El Toro Water District Water Conservation & Water Supply Shortage Ordinance ("Ordinance No. 2015-3")

Section II. Findings, Determinations and Authority

1. **Resolution No. 15-6-1** -- The recitals, finding and determinations set forth in Resolution No. 15-6-1 are fully incorporated herein as though set forth in full.

2. **A reliable minimum supply of potable water is essential** to the public health, safety and welfare of the people and economy of Southern California.

3. **Southern California is a semi-arid region, largely dependent on imported water** supplies from Northern California and the Colorado River. Population growth, drought, climate change, environmental concerns, government policy changes, restrictions on pumping and other factors in our region, in other parts of the State and in the western U.S. make Southern California highly-susceptible to water supply reliability issues.

4. **Careful water management requires active conservation measures** not only in times of drought but at all times. It is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

5. **California Constitution Article X, Section 2 and California Water Code Section 100** provide that because of conditions prevailing in the state of California, it is the declared policy of the State that the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable and that the waste or unreasonable us or unreasonable method of water be prevented, and that the conservation of such water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.

6. **California Water Code Section 375** authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

7. **California Water Code Sections 350, et. seq.,** sets forth the determination and notification procedures for water suppliers seeking to declare a water shortage or a water emergency.

8. **California Water Code Section 356** allows for the adoption of regulations and restrictions that include discontinuance of service as an enforcement option where a water shortage emergency condition has been declared.

9. **California Water Code Section 370, et. seq.,** authorizes water suppliers to adopt water allocation programs for water users and allocation-based conservation water conservation pricing.

10. California Water Code Section 375 et seq., authorizes public water suppliers to establish by Ordinance, the maximum levels of water to be used by customers under emergency supply conditions (which give rise to the utilization of the Drought Factor), and declaring that the customer's excess usage, to be a violation of this Ordinance.

11. California Water Code Sections 13550 and 13551 declare a statewide policy that the use of potable domestic water for irrigation purposes when reclaimed (recycled) water is available constitutes a waste or unreasonable use of water within the meaning of the State Constitution.

12. El Toro Water District's Rules and Regulations requires that future developments utilize reclaimed (recycled) water wherever economically and technically feasible within the boundaries of the District in order to conserve potable water for the purposes of human consumption and fire protection.

13. The adoption and enforcement of a Water Conservation & Water Supply Shortage Ordinance is necessary to manage the District's potable water supply short- and long-term and to minimize and/or avoid the effects of drought and water shortage within the District. Such a program is essential to ensure a reliable and sustainable minimum supply of water for public health, safety and welfare.

14. California Government Code Section 53069.4 authorizes a local public agency to make a violation of an Ordinance, subject to an "administrative fine or penalty". "Penalty", as used throughout this Ordinance is an "Administrative Penalty", authorized pursuant to this section.

Section III. Declaration of Purpose and Intent

1. To minimize or avoid the effect and hardship of potential shortages of **potable water** to the greatest extent possible, this Ordinance establishes a Water Conservation & Water Supply Shortage Program designed to:

    a. Enable effective potable water supply planning

    b. Assure reasonable and beneficial use of potable water

    c. Prevent waste of potable water and maximize efficient use in the District

2. **This Ordinance in conjunction with the District's Water Budget Based Tiered Conservation Rate Structure (which is subject to the provisions of Proposition 218 and is incorporated into the Cost of Service Rate Study) establishes:**

a. **Permanent Mandatory Water Conservation Measures** are designed to alter behaviors related to potable water-use efficiency during non-shortage conditions

b. **Three levels of potential response to escalating water supply shortages** which the El Toro Water District Board may implement during times of declared water shortage or water emergency. The three levels of response consist of expanded water use restrictions and the possible imposition of water supply shortage allocations through the use of a "drought factor" in conjunction with the District's Water Budget Based Tiered Conservation Rate Structure which is a component of the water budget calculation that is an integral part of the District's Water Budget Based Tiered Conservation Rate Structure, which modifies (reduces) the indoor and/or outdoor budget to further encourage conservation in times of water supply shortage emergencies and Administrative Penalties imposed on designated customer categories who exceed their revised water budget.

Section IV. Definitions

1. **General**

a. **"The District"** means El Toro Water District.

b. **"The Board"** means the El Toro Water District Board of Directors.

c. **"Person"** means any person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the District.

d. **"Potable Water"** means water that is suitable for drinking.

e. **"Recycled Water"** means the reclamation and reuse of non-potable water and/or wastewater for beneficial use, such as irrigation. Also known as "Reclaimed Water."

f. **"Water Waste"** refers to uses of water that are limited or prohibited under the Ordinance because they exceed necessary or intended use and could reasonably be prevented, such as runoff from outdoor watering.

g. **"Billing Unit"** is equal to 100 cubic feet (1 CCF) of water, which is 748 gallons. Water use is measured in units of 100-cubic-feet and multiplied by applicable water usage rates for billing. Also known as a "Unit of Water."

h. **"Undue Hardship"** is a unique circumstance in which a requirement of the Ordinance would result in a disproportionate impact on a water user or property upon which water is used compared to the impact on water users generally or similar properties or classes of water use.

i. **"Safety and Sanitary Hazard"** is one which presents an immediate and imminent threat to human health (injury).

j. "**Water Budget Based Tiered Conservation Rate Structure**" ("Tiered Conservation Rate Structure") is a rate structure which provides "water budgets" to each customer based on efficient indoor and outdoor need. Water used in excess of the combined indoor and outdoor budget is billed at a progressively higher rate which is designed to recover the increased cost associated with providing such water and provides a clear indicator regarding inefficient use of potable water. The increased rates and potential Administrative Penalties for utilization of water in excess of budgeted amounts provide financial incentive to stay within assigned budgets and to comply with Permanent Mandatory Water Conservation Measures.

k. **"Water Supply Shortage Emergency"** means a condition existing within the State, Region and/or the District in which the ordinary water demands and requirements of persons within the District cannot be satisfied without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation, and fire protection. A water shortage emergency includes both an immediate emergency, in which the District is unable to meet current water needs of persons within the District, as well as a threatened water shortage, in which the District determines that its future supply of water may not meet an anticipated future demand.

l. **"Administrative Penalty"** means a financial penalty as authorized by Government Code Section 53069.4 as a result of any person or entity violating the provisions of this Ordinance.

2. **Irrigation**

a. **"Irrigation Controller"** is the part of an automated irrigation system that instructs the valves to open and close to start or stop the flow of water.

1. **"Sensor-based irrigation controller"** operates based on input from a combination of sensors (rain, solar, soil moisture) installed in or around the landscaped area.

2. **"Weather-based irrigation controller"** operates automatically based on evapo-transpiration rates and historic or real-time weather data.

b. **"Irrigation System"** refers to a manual or automated watering system consisting of pipes, hoses, spray heads and/or sprinkler devices or valves. Also known as a "Landscape Irrigation System."

c. **"Positive Self-Closing Shut-Off Hose Nozzle"** refers to a water-efficient hose nozzle for residential or commercial hoses that users must press or release to start or stop the flow of water. Also known as an "Automatic Shut-Off Nozzle."

d. **"Valves"** refer to the part of an irrigation system that opens and closes manually or electronically to start or stop the flow of water.

3. Other

   a. **"Pre-Rinse Kitchen Spray Valves"** refer to highly water-efficient sprayers that commercial kitchens use to rinse dishes in the sink before washing and for other preliminary cleaning purposes.

   b. **"Single-Pass Cooling System"** refers to an air conditioning, refrigeration or other cooling system that removes heat by transferring it to a supply of clean water and dumping the water down the drain – after a single use. This type of cooling system is extremely water-inefficient compared to systems that re-circulate the water.

Section V. Application of Ordinance

1. **The provisions of this Ordinance apply to any person or entity using potable water provided by the District.** This includes individuals, persons, corporations, public or private entities, governmental agencies or institutions, or any other users of District water.

2. **In addition, the provisions of this Ordinance do not apply to the following:**

   a. **Water use which is immediately necessary to protect public health and safety** or for essential government services, such as police, fire and similar services.

   b. **Recycled water use for irrigation.** Use of recycled water requires a permit that has specific use restrictions, many of which focus on water efficiency. Given such permits and the interest in promoting the use of recycled water as a means to preserve potable, recycled water is exempt from all requirements of this Ordinance.

   c. **Water used by nurseries and growers** to sustain plants, trees, shrubs, crops, compost or other landscape vegetation material intended for distribution or commercial sale.

3. **This Ordinance is intended solely to further the conservation of potable water.** It is not intended to implement any provision of federal, state or local statutes, ordinances or regulations relating to protection of water quality or control of drainage or runoff. Refer to the local jurisdiction or Regional Water Quality Control Board for information on storm water ordinances or management plans.

Section VI: Permanent Mandatory Water Conservation Measures (Refer to Appendix A Summary Table)

The following Permanent Mandatory Water Conservation Measures for potable water are in effect at all times.

1. **General Restrictions – Residential, Irrigation, Commercial and Public Customers**

    a. **Limits on Outside Watering Hours**

        1. **Watering or irrigating is prohibited any day of the week between 10:00 a.m. and 5:00 p.m.**.

        2. The week includes weekdays and weekends, seven (7) days

        3. This applies to lawns, landscaping and all other vegetated areas.

        4. The following are **exempt** from this restriction:

            a. Watering with a hand-held bucket or similar container
            b. Watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle
            c. Adjusting or repairing an irrigation system for very short periods of time

    b. **Limits on Outside Watering Duration**

        1. **Watering or irrigating with a device or system that is not continuously attended is limited to no more than 15 minutes per day per valve.**

        2. This applies to lawns, landscaping and all other vegetated areas.

        3. The following irrigation systems are **exempt:**

            a. Very low-flow drip-type systems where no emitter discharges more than two (2) gallons of water per hour
            b. Systems equipped with sensor or weather-based controllers.

    c. **No Excessive Water Flow or Runoff:** It is prohibited to water lawns, landscaping and vegetated areas in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.

    d. **No Outside Watering when it is Raining:** During rain events and following 48 hours of significant precipitation, outside watering must be manually terminated or automatically terminated using sensor-based or weather-based irrigation controllers.

    e. **Obligation to Fix Leaks, Breaks or Malfunctions in lines, fixtures or facilities**

        1. Excessive use, loss or escape of water through breaks, leaks or malfunctions in the water user's plumbing or distribution system:

            a. Is prohibited for any period of time after such water waste should have reasonably been discovered and corrected

b. Must be corrected in **no more than five (5) days of District notification**

f. **No Hosing or Washing Down Hard or Paved Surfaces**

1. It is prohibited to hose or wash down hard or paved surfaces, such as sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys.

2. When it is necessary to hose or wash down hard or paved surfaces to alleviate safety or sanitary hazards, the following may be used:

a. Hand-held bucket or similar container
b. Hand-held hose equipped with a positive self-closing shut off hose nozzle
c. Low-volume high-pressure cleaning machine equipped to recycle used water

g. **No Hosing or Washing Down Vehicles**

1. It is prohibited to use water to hose or wash down a motorized or non-motorized vehicle, including but not limited to automobiles, trucks, vans, buses, motorcycles, boats or trailers.

2. The following are **exempt** from this restriction:

a. Use of a hand-held bucket or similar container
b. Use of a hand-held hose equipped with a positive self-closing shut off hose nozzle
c. Commercial car washing facility

h. **Re-Circulating Decorative Water Fountains and Features** All decorative water fountains and water features must re-circulate water -- or users must secure a waiver from the District.

2. **Commercial Food-Serving & Lodging Requirements**

a. **Water Served Only Upon Request.** Eating or drinking establishments, including but not limited to restaurants, hotels, cafes, bars or other public places where food or drinks are sold, or served or offered for sale, are prohibited from providing drinking water to any person unless requested.

b. **Option Not To Have Towels/Linens Laundered.** Hotels, motels and other commercial lodging establishments must provide guests the option of not having their used towels and linens laundered. Lodging establishments must prominently display notice of this option in each room and/or bathroom, using clear and easily understood language.

3. **Commercial Kitchen Requirements**

    a. **Water-Efficient Pre-Rinse Kitchen Spray Valves.** Food preparation establishments, such as restaurants, cafes and hotels, are prohibited from using non-water efficient kitchen spray valves, as follows:

        1. **New** kitchen spray valves must use 1.6 gallons or less per minute.

        2. **Existing** kitchen spray valves must be retrofitted to models using 1.6 gallons of water or less per minute.

4. **Commercial Water Recirculation Requirements**

    a. **Car Wash and Laundry System Requirements:** All **new** commercial car-wash and laundry facilities and systems must re-circulate the wash water -- or secure a waiver of this requirement from the District.

    b. **No Single-Pass Cooling Systems:** Buildings requesting **new** water service or being **remodeled** are prohibited from installing single-pass systems.

5. **Indiscriminate Water Use.** Upon notice by the District, persons shall cease to cause or permit the indiscriminate use of water not otherwise prohibited above which is wasteful and without reasonable purpose.

6. **Public Health and Safety.** These regulations shall not be construed to limit water use which is immediately necessary to protect public health and safety for essential government services, such as police, fire and similar services.

Section VII: Level 1 Water Supply Shortage Emergency Declaration *Up to 20% shortage in imported water supplied to the District and/or up to 20% reduction needed in consumer demand*

1. **Level 1 Water Supply Shortage Emergency Declaration**

    a. A Level 1 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during which, at its sole discretion, determines and declares that **a reduction in consumer demand is necessary** due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions and thereby proclaims and declares a Level 1 Water Supply Shortage Emergency.

    b. The type of event that may prompt the Board to declare a Level 1 Water Supply Shortage Emergency could include, among other factors, a finding that:

        i. its **wholesale water supplier has allocated to the District at least 80% of the District's base water supply.** "Base water supply" refers to the District's average annual water purchases from the wholesaler over a given period, as defined by the wholesaler. At this water allocation level, the District could experience a **shortage in imported supplies of up to 20%.**
        ii. State mandated reductions in water use,
        iii. Other water supply conditions,

2. **During a Level 1 Water Supply Shortage Emergency, Permanent Mandatory Water Conservation Measures** identified in Section VI of this Ordinance **remain in effect.**

3. **Level 1 Mandatory Water Conservation Measures take effect** upon the Board declaring a Level 1 Water Supply Shortage Emergency and apply for the duration of the shortage:

    a. **Limits on Outside Watering Days**

        1. No more than **three (3) days per week from April – October** and no more than **one (1) day per week from November – March.** This applies to lawns, landscaping and all other vegetated watering schedules. **Assigned watering days have been established to coincide with Municipal City Boundaries. Refer to Appendix B for assigned watering days.**

        2. The following are **exempt** from these restrictions:

            a. Watering with a hand-held bucket or similar container
            b. Watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle
            c. Irrigation systems that exclusively use very-low-flow drip type systems where emitters discharge no more than two (2) gallons of water per hour.

4. **Administrative Penalty:**

    1. During a Level 1 Water Supply Shortage Emergency, any water customer subject to water budgets who willfully use water in excess of their combined Tier I and Tier II water budgets shall be in violation of this Ordinance and, upon Board authorization and approval, will be subject to an Administrative Penalty in the range of $2.00 to $10.00 as determined by the Board by minute order (motion) or Resolution at an open and public meeting for each ccf of water used in excess of their combined Tier I and Tier II budget.
    2. Such penalty shall be in addition to the water use charge imposed by the District for Tier III and Tier IV water usage.

5. Other Prohibited Uses: The District may implement other prohibited water uses as deemed necessary, after notice to customers.

Section VIII: Level 2 Water Supply Shortage Emergency Declaration ***Up to 40% shortage in imported water supplied to the District and/or up to 40% reduction needed in consumer demand***

1. **Level 2 Water Supply Shortage Emergency Declaration**

a. A Level 2 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during which, at its sole discretion, determines and declares that **an additional reduction in consumer demand is necessary** due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to water conditions and thereby proclaim and declares a Level 2 Water Supply Shortage Emergency.

b. The type of event that **may** prompt the Board to declare a Level 2 Water Supply Shortage could include, among other factors, a finding that:

   i. its **wholesale water supplier has allocated to the District at least 60% of the District's base water supply.** "Base water supply" refers to the District's average annual water purchases from the wholesaler over a given period, as defined by the wholesaler. At this water allocation level, the District could experience a **shortage in imported supplies of up to 40%.**
   ii. State mandated reductions in water use,
   iii. Other water supply conditions,

2. The following **Mandatory Water Conservation Measures** **remain in effect** during a Level 2 Water Supply Shortage Emergency:

   a. **Permanent Water Conservation Measures** identified in Section VI
   b. **Level 1 Water Conservation Measures** identified in Section VII

3. The following **Water Conservation Measures** **take effect** upon declaration of a Level 2 Water Supply Shortage Emergency and apply for the duration of a Level 2 Water Supply Shortage Emergency:

   a. **Additional Limits on Outside Watering Days**

      1. Watering lawns, landscaping and other vegetated areas is limited to **no more than two (2) days per week from April – October.** This is one (1) day less than required during a Level 1 Water Shortage. The number of watering days permitted from November – March remains the same at no more than one (1) day per week.

      2. The District will establish and post the new watering schedule. **Assigned watering days have been established to coincide with Municipal City Boundaries. Refer to Appendix B for assigned watering days.**

      3. The following are **exempt** from these restrictions:

         a. Watering with a hand-held bucket or similar container
         b. Watering with a hand-held hose equipped with a positive self-closing shut off hose nozzle
         c. Irrigation systems that exclusively use very-low-flow drip type systems where emitters discharge no more than two (2) gallons of water per hour.

b. **Shorter Timeframe to Fix Leaks, Breaks or Malfunctions** in water users' pipelines, fixtures or facilities.

1. Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system must be **fixed in no more than three (3) days following notification from the District** -- unless other arrangements are made with the District.

2. This shorter timeframe is two (2) days less than required under Permanent Water Conservation Measures, Section VI.

c. **No Filling or Refilling Ornamental Lakes and Ponds**

1. Filling or refilling ornamental lakes and ponds is prohibited.

2. **Exempt** are ornamental lakes and ponds that sustain aquatic life -- provided such life is of significant value and was actively managed in the water feature prior to declaring the shortage.

d. **No Filling or Refilling Residential Pools or Spas**

1. Filling residential swimming pools or outdoor spas is prohibited; refilling more than one (1) foot of water is prohibited.

2. **Exempt** are (1) individuals who, due to health reasons or medical conditions, find it necessary to fill or refill their pools or spas; or (2) Individuals who have not filled their pool in the last 24 months and who adhere to Best Practices for the construction and operation of pools and spas as defined in Appendix C.

e. **No Hosing or Washing Down Vehicles:** It is prohibited to use water to hose or wash down a motorized or non-motorized vehicle, including but not limited to automobiles, trucks, vans, buses, motorcycles, boats or trailers. The **only exemption** from this restriction is washing vehicles at a commercial car washing facility that recycles its wash water.

4. Administrative Penalty –

1. During a Level 2 Water Supply Shortage Emergency, any water customer subject to water budgets pursuant to the District's Tiered Conservation Rate Structure who willfully use water in excess of their combined Tier I and Tier II water budgets shall be in violation of this Ordinance and, upon Board authorization and approval will be subject to an Administrative Penalty in the range of $2.00 to $10.00 as determined by the Board by minute order (motion) or Resolution at an open and public meeting, for each ccf of water used in excess of their combined Tier I and Tier II budget.

2. Such penalty shall be in addition to the water use charge imposed by the District for Tier III and Tier IV water usage.

5. **Other Prohibited Uses:** The District may implement other prohibited water uses as deemed necessary, after notice to customers.

Section IX. Level 3 Water Supply Shortage Emergency Declaration ***More than 40% shortage in imported water supplied to the District and/or more than 40% reduction needed in consumer demand***

1. **Level 3 Water Supply Shortage Emergency Declaration**

   a. A Level 3 Water Supply Shortage Emergency shall be initiated only after the District Board of Directors holds a Public Hearing during which, at its sole discretion, determines and declares that **a further additional reduction in consumer demand is necessary** due to drought or water supply cutbacks in order to make more efficient use of water and appropriately respond to existing water conditions and thereby proclaims and declares a Level 3 Water Supply Shortage Emergency.

   b. The type of event that **may** prompt the Board to declare a Level 3 Water Supply Shortage Emergency could include, among other factors, a finding that:

      i. its **wholesale water supplier has allocated to the District less than 60% of the District's base water supply.** "Base water supply" refers to the District's average annual wholesale water purchases over a given period, as defined by the wholesaler. At this reduced water allocation level, the District could experience a **shortage in imported supplies of more than 40%.**
      ii. State mandated reductions in water use,
      iii. Other water supply conditions,

2. The following **Mandatory Water Conservation Measures remain in effect**:

   a. **Permanent Water Conservation Measures** identified in Section VI
   b. **Level 1 Water Conservation Measures** identified in Section VII
   c. **Level 2 Water Conservation Measures** identified in Section VIII

3. The following **Mandatory Water Conservation Measures take effect** upon declaring a Level 3 Water Emergency and apply for the duration of the Emergency:

   a. **All Outside Watering Prohibited**

      1. **Watering is prohibited on any day at any time** for lawns, landscaping and all vegetated areas.

      2. **Exempt** from this restriction are the following -- unless the District determines that recycled water is available and lawful for use:

a. Public works projects and actively-irrigated environmental mitigation projects will be allowed to operate under the Outside Watering Restrictions identified in Level II – Section VIII.
b. Maintenance of vegetation, trees and shrubs using (subject to hour restrictions in Section VI.1.a.1):
    1. A hand-held bucket or similar container
    2. A hand-held hose equipped with a positive self-closing shut off hose nozzle
    3. Irrigation systems that exclusively use very-low-flow drip type systems where emitters discharge no more than two (2) gallons of water per hour

c. Maintenance of (subject to hour restrictions, Section VI.1.a.1):
    1. Existing landscaping necessary for fire protection and/or soil erosion control. To the extent necessary, the District will utilize appropriate outside agencies to confirm exemption eligibility.
    2. Plant materials identified as rare or essential to the well being of endangered/rare species

b. **Shorter Timeframe to Fix Leaks, Breaks or Malfunctions** in pipelines, fixtures or facilities.

1. Excessive use, loss or escape of water through breaks, leaks or malfunctions in the water user's plumbing or distribution system must be fixed in **no more than two (2) days** following District notification – unless other arrangements are made with the District. The timeframe is one (1) day less than for Level 2.

c. **No Filling or Refilling Residential Pools or Spas**

3. Filling residential swimming pools or outdoor spas is prohibited; refilling more than one (1) foot of water is prohibited.

4. **Exempt** are individuals who, due to health reasons or medical conditions, find it necessary to fill or refill their pools or spas.

d. **No New Potable Water Service**

1. During a Level 3 Water Supply Shortage Emergency, the **District will not provide:**

a. New potable water service
b. New water meters (temporary or permanent)
c. Will-serve letters

2. The District will **only issue** will-serve letters in the following cases:

a. Projects necessary to protect public health, safety & welfare
b. Projects that have a valid, unexpired city building permit

c. Projects in which applicants can provide -- to the satisfaction of the District -- substantial evidence of an enforceable commitment that water demands will be offset prior to the provision of a new water meter(s)

3. This prohibition **does not preclude** resetting or turning-on meters to restore or continue water service interrupted for one year or less.

Discontinue Service: Per Water Code Section 356, the District, in its sole discretion, may discontinue service to customers who willfully violate Section IX provisions.

4. **"Administrative Penalty"**

1. During a Level 3 Water Supply Shortage Emergency, any water customer subject to water budgets pursuant to the District's Tiered Conservation Rate Structure who willfully use water in excess of their combined Tier I and Tier II water budgets shall be in violation of this Ordinance and, upon Board authorization and approval will be subject to an Administrative Penalty in the range of $2.00 to $10.00 as determined by the Board by minute order (motion) or Resolution at an open and public meeting, for each ccf of water used in excess of their combined Tier I and Tier II budget.

2. Such penalty shall be in addition to the water use charge imposed by the District for Tier III and Tier IV water usage.

5. **Other Prohibited Uses:** The District may implement other prohibited water uses as deemed necessary, following notification of customers

Section X. Other Provisions

1. **Customer Water Conservation Plans:**

a. **Customers with high annual water usage.** During Level 1, Level 2 **or** Level 3 Water Shortages Emergency, the District Board of Directors, at its sole discretion and by written request, may require residential, irrigation, commercial and/or public customers using **ten thousand (10,000) or more billing units per year** to submit a Water Conservation Plan to the District and to submit quarterly progress reports on such plan. The conservation plan must make recommendations for increased water savings, including increased use of recycled water based on feasibility. Quarterly progress reports must include status on implementation of recommendations.

2. **Recycled Water To Replace Potable Water**

a. **Future Developments.** When available, El Toro Water District requires the use of recycled water in future developments.

b. **New Water Service:** Prior to the connection of any new water service, the District will determine whether recycled water is appropriate and available to meet the requirements of the new service request. Recycled water must be utilized to the extent feasible, as determined by the District.

c. **Transition from Potable Water:** The District may prohibit the use of potable water in certain instances – if the District determines that a specified use for potable water could be achieved with recycled water as a cost-effective alternative and the customer is given a reasonable time to make the conversion, as determined by the District's General Manager.

3. **Recycled Water Construction Site Requirements**

   a. **Recycled or non-potable water** must be used, when available.

   b. **No potable water may be used for soil compaction or dust control** where there is a reasonably-available source of recycled or non-potable water approved by the Department of Public Health and appropriate for such use.

   c. **Water hoses shall be equipped with automatic shut-off nozzles,** given such devices are available for the size and type of hoses in use.

4. **Automated Irrigation Control System Requirements for Commercial, Multi-Family and Community Development/Redevelopment Projects**

   New Commercial, Multi-Family and Community development and/or redevelopment projects that include landscaped open space, park and recreation areas will be required to install a sensor-based or weather-based irrigation controller.

5. **A Customer Water Waste Hotline** will be established and incorporated into the District's Customer Outreach Plan.

Section XI. Declaration & Notification of Water Supply Shortage Emergency Declarations

1. **Declaration of a Level 1, 2 or 3 Water Supply Shortage Emergency:** The District Board of Directors may declare a Level 1, 2 or 3 Water Supply Shortage Emergency in accordance with the procedures specified in Water Code Sections 351 and 352 (Public Hearing, Notice and Publication). Thereafter, penalties and violations under Section XIII apply.

2. **Notification of Declared Water Supply Shortages Emergency**

   The District must publish a copy of the water shortage/emergency resolution in a newspaper used for the publication of official notices within the jurisdiction of the District within fifteen (15) **days** of the date that a Water Supply Shortage Emergency is declared.

Section XII. Hardship Waiver

1. **Undue and Disproportionate Hardship:** If, due to unique circumstances, a specific requirement of the Ordinance would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirements as provided in this section.

2. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship.

    a. **Application for a Waiver**: Application for a waiver must be on a form prescribed by the District.

    b. **Supporting Documentation**: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

    c. **Required Findings for Waiver:** Based on the information and supporting documents provided in the application, additional information provided as requested, and water use information for the property as shown by the records of the District, the District **General Manager** in making the waiver determination will take into consideration the following:

        1. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

        2. That because of special circumstances applicable to the property or its use, the strict application of this Ordinance would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

        3. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the District to effectuate the purpose of this Ordinance and will not be detrimental to the public interest; and

        4. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

    d. **Approval Authority**

        1. The District General Manager or his designee(s) must act upon any completed **Application for a Waiver** no later than ten (10) days after receipt by the District.

        2. The General **Manager or his designee(s) may approve, conditionally approve, or deny the waiver** and the decision will be final.

        3. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise, at the time a waiver is

approved, it will apply to the subject property for the duration of the water supply shortage or emergency.

Section XIII: Non-Compliance

1. **Non-Compliance with Permanent, Level 1 & Level 2 Mandatory Conservation Measures**

   Non-Compliance: The District will issue a **written warning** and provide information regarding the necessity to comply with all Water Conservation Measures.

2. **Non-Compliance with Level 3 Mandatory Conservation Measures**

   a. **Non-Compliance Charges:** The following will apply to persons or entities failing to comply with any provision of the Ordinance for Level 3 Mandatory Water Conservation Measures:

      1. **First Instance of Non-Compliance:** The District will issue a **written warning** and send it along with an explanation of the violation.

      2. **Second Instance of Non-Compliance:** A second instance of non-compliance with the Ordinance within the preceding twelve (12) calendar months is punishable by a non-compliance charge on the water bill not to exceed **two hundred and fifty dollars ($250)**.

      3. **Third Instance of Non-Compliance:** A third instance of non-compliance with the Ordinance within the preceding twelve (12) calendar months is punishable by a non-compliance charge on the water bill not to exceed **five hundred dollars ($500)**.

   b. **Water Flow Restrictor and/or Termination of Service**

      1. **Water Flow Restrictor Device.** In addition to any non-compliance charges, the District may install a water flow restrictor device. If the District determines to install a water flow restrictor, installation of the flow restrictor would follow written notice of intent to the customer and would be in place for a minimum of forty eight (48) hours.

      2. **Termination of Service:** In addition to any non-compliance charges and the installation of a water flow restrictor, the District may disconnect and/or terminate a customer's water service, pursuant to Water Code Section 356.

      3. **Costs for Water Flow Restrictors and Service Disconnection**

         a. A person or entity in non-compliance with this Ordinance is responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting

and/or reconnecting service per the District's schedule of charges then in effect.

b. The charge for installing and/or removing any flow restricting device must be paid to the District before the device is removed.

c. Nonpayment will be subject to the same remedies as nonpayment of basic water rate

c. **Misdemeanor:** Pursuant to Water Code Section 377, any instance of non-compliance with the Ordinance may be prosecuted as a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days or by a fine not exceeding one thousand dollars ($1,000) or by both.

3. **Separate Offenses:** Each day that a person or entity is non-compliant with the Ordinance is a separate offense.

4. **Notice of Non-Compliance/ Appeal and Hearing Process**

a. The District will issue a **Notice of Non-Compliance** by mail or personal delivery at least ten (10) days before taking enforcement action. The notice will describe the violation and, if applicable, the date by which corrective action must be taken.

b. **A customer may appeal the Notice of Non-Compliance** by filing a written Notice of Appeal with the District no later than the close of business on the 10th day following receipt of the enforcement action. A customer appeal shall state the grounds for the appeal.

1. **Any Notice of Non-Compliance not timely appealed will be final.**

2. Upon receipt of a timely appeal, **the District will schedule a hearing on the appeal** and mail written notice of the hearing date to the customer at least ten (10) days before the hearing.

3. The District General Manager or his designee(s) will hear the appeal and issue a written **Notification of Decision** within ten (10) days of the hearing.

c. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the District **may take appropriate steps to prevent the unauthorized use of water** given the nature and extent of the violations and the current declared water shortage level condition, including restricting the level of water use until the appeal is heard.

Section XIV: Administrative Penalty Provisions

1. **Administrative Penalty.** Pursuant to the authority provided for in Government Code Section 53069.4, the District finds, adopts and determines that all penalties provided for in this Ordinance No. 2015-3, as a result of any person or entity violating various provisions set forth herein shall constitute an Administrative Penalty.

2. **Notice and Due Process.** Upon the declaration of a Water Supply Shortage Emergency and publication of the notice required herein, Proper notice shall be deemed to have been given to each and every person and/or entity supplied water within the District, and the applicable water shortage.

3. **Collection of Penalties.** Any penalty imposed pursuant to this Ordinance may be collected on a customer's water bill. Any penalty shall be applicable to water used in violation of this Ordinance during the first complete billing cycle after the declaration of the applicable water shortage stage.

4. **Notice of Violation.** The receipt of a water bill with any applicable penalties shall serve as notice of violation of this Ordinance.

5. **Appeal Procedures.** Any customer who wishes to appeal the imposition of an Administrative Penalty imposed by the District shall comply with the following procedures:

6. **Appeal Request.** An Appeal Request form shall be submitted to the District's Customer Service Department.

   (a) Appeal Request forms may be obtained at the District's Main Office or downloaded from the District's website at www.etwd.com.

   (b) An Appeal Request form shall be received by the District no later than thirty calendar days from the date that the Appellant's water bill for the four-week period in which the penalty or penalties were imposed is due.

   (c) Additional Documentation. Additional documentation may be requested at the discretion of the District. Such documentation may include, but is not limited to, school records, driver's licenses, business licenses, lease agreements.

   (d) Site Survey. After an Appeal Request form has been received, a site survey may be required by District staff to verify the irrigated square footage of the property where the water was delivered. The site survey will be at no charge to the person and will require the person who submitted the Appeal Request form to be present.

   (e) District Response. A response to an Appeal Request shall be provided by the District within thirty calendar days from receipt of the Appeal Request form.

   (f) Review of Denial of Appeal Request. If an Appeal Request is denied, the Appeal Request form may be resubmitted by the customer for review by the District's General Manager. The Decision by the District's General Manager shall be final.

7. **Use of Penalty Funds Collected.** The Board of Directors hereby declares its intent to use penalty funds collected to pay any penalties/charges that may be imposed by the State and/or wholesale water provider of the District for exceeding its baseline water budget allocation and in furtherance of conservation efforts and/or acquisition of supplemental water supplies.

Section XV: Severability: If any section, subsection, sentence, clause or phrase in this Ordinance is for any reason held invalid, the validity of the remainder of the Ordinance will not

be affected. The District Board of Directors hereby declares it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases thereof is declared invalid.

Section XVI: Effective Date of Ordinance: This Ordinance shall be effective immediately upon adoption.

ADOPTED, SIGNED, AND APPROVED by the following vote this 9th day of June, 2015.

AYES: President Goldman, Vice President Kahn, Director Adjarian, Director Vergara
NOES: Director Monin
ABSTAIN: None
ABSENT: None

EL TORO WATER DISTRICT

M. Scott Goldman, President
El Toro Water District and the
Board of Directors thereof

ATTEST:

Robert R. Hill, General Manager/Secretary
El Toro Water District and the
Board of Directors thereof

Appendix A

ETWD Water Conservation & Water Shortage Ordinance Provisions
Summary Table of Mandatory Water Conservation Measures

Year-round	*Water Supply Alert*	*Water Supply Warning*	*Water Emergency*
Permanent	**Level 1** **Water Supply Shortage - Up to 20% shortage in imported supplies to District**	**Level 2** **Water Supply Shortage - Up to 40% shortage in imported supplies to District**	**Level 3** **Water Supply Shortage - More than 40% shortage in imported supplies to District**
Ordinance Section VI	**Ordinance Section VII** **Same as Permanent Measures PLUS**	**Ordinance Section VIII** **Same as Permanent & Level 1 Measures PLUS**	**Ordinance Section IX** **Same as Permanent, Level 1& Level 2 Measures PLUS**
General Restrictions			
a. Prohibited any day of the week between 10 am – 5 pm PST (except using bucket or positive self closing shut-off hose nozzle or for quick system repairs)	a. Watering limited to: - 3 days a week from Apr-Oct - 1 day a week from Nov-Mar	a. Watering limited to; - 2 days a week from April–Oct - Nov-Mar remains 1 day a week	a. All watering prohibited (some exceptions)
b. No more than 15 minutes of watering per day, per valve on unattended automatic irrigation systems (some exemptions)		b. Fix leaks/breaks within reasonable time or no more than 3 days of District notice	b. Fix leaks/breaks within reasonable time or no more than 2 days of District notice
c. No excessive water flow or runoff		c. No filling or refilling ornamental lakes and ponds (some exceptions) d. No filling residential swimming pools or outdoor spas or refilling more than 1 foot (some exceptions)	c. No new potable water, new water meters (temporary or permanent) or issuance of will-serve letters (some exceptions for will-serve letters)
d. No outside watering when it is Raining and following 48 hours of significant precipitation.		e. Wash cars only at commercial car wash with re-circulating system	d. Option to discontinue service for customers who willfully violate provisions during water emergency

Appendix A

ETWD Water Conservation & Water Shortage Ordinance Provisions
Summary Table of Mandatory Water Conservation Measures

Year-round	*Water Supply Alert*	*Water Supply Warning*	*Water Emergency*
Permanent	**Level 1** **Water Supply Shortage - Up to 20% shortage in imported supplies to District**	**Level 2** **Water Supply Shortage - Up to 40% shortage in imported supplies to District**	**Level 3** **Water Supply Shortage - More than 40% shortage in imported supplies to District**
Ordinance Section VI	**Ordinance Section VII** **Same as Permanent Measures PLUS**	**Ordinance Section VIII** **Same as Permanent & Level 1 Measures PLUS**	**Ordinance Section IX** **Same as Permanent, Level 1& Level 2 Measures PLUS**
e. Fix leaks/breaks within reasonable time or no more than 5 days of District notice			
f. No hosing or washing down hard or paved surfaces (except by hand to eliminate safety or sanitary hazards)	Optional Program at Levels 1, 2 or 3: Require Commercial, Industrial and Institutional users in District (10,000 billing units or more per year) to submit water conservation plan and reports to the District.		
g. No hosing or washing down vehicles, except using a bucket or positive self closing shut-off hose nozzle or commercial car wash			
h. Decorative water fountains or features must re-circulate water			
Commercial Food Serving/Lodging			
a. Restaurants only serve water on request			
b. Hotels must provide guests option to not launder linens/towels			

Appendix A

ETWD Water Conservation & Water Shortage Ordinance Provisions
Summary Table of Mandatory Water Conservation Measures

Year-round	*Water Supply Alert*	*Water Supply Warning*	*Water Emergency*
Permanent	Level 1 Water Supply Shortage - Up to 20% shortage in imported supplies to District	Level 2 Water Supply Shortage - Up to 40% shortage in imported supplies to District	Level 3 Water Supply Shortage - More than 40% shortage in imported supplies to District
Ordinance Section VI	Ordinance Section VII Same as Permanent Measures PLUS	Ordinance Section VIII Same as Permanent & Level 1 Measures PLUS	Ordinance Section IX Same as Permanent, Level 1& Level 2 Measures PLUS

Commercial Kitchens			
a. Water-efficient pre-rinse kitchen sprayers required for: - New installations & Retrofits			
Commercial Water Re-circulation			
a. No installation of non-re-circulating car wash or laundry facilities or systems			
b. No single-pass cooling sys. for new or remodeled buildings			

Appendix B

ETWD Water Conservation & Water Shortage Ordinance Provisions
Level 1, 2 & 3 Water Supply Shortage - Assigned Outside Watering Days by City Boundary

	Water Supply Alert	*Water Supply Warning*	*Water Emergency*
	Level 1 Water Supply Shortage - Up to 20% shortage in imported supplies to District	**Level 2** Water Supply Shortage - Up to 40% shortage in imported supplies to District	**Level 3** Water Supply Shortage - More than 40% shortage in imported supplies to District
City/Municipality	**Watering Limited to:** **3 days a week from April to Oct.** **Nov. – Mar. 1 day a week** **(Note Section VII.3.a.2 for Exemptions)**	**Watering limited to:** **2 days a week from April to Oct.** **Nov. – Mar. remains 1 day a week** **(Note Section VIII.3.a.3 for Exemptions)**	**Watering prohibited** **(Note Section IX.3.a.2 for Exemptions)**
City of Mission Viejo	Monday & Thursday & Saturday or Sunday	Monday or Thursday & Saturday or Sunday	Prohibited – Note Exemption
City of Aliso Viejo	Monday & Thursday & Saturday or Sunday	Monday or Thursday & Saturday or Sunday	Prohibited – Note Exemption
City of Laguna Woods	Tuesday & Friday & Saturday or Sunday	Tuesday or Friday & Saturday or Sunday	Prohibited – Note Exemption
City of Laguna Hills	Tuesday & Friday & Saturday or Sunday	Tuesday or Friday & Saturday or Sunday	Prohibited – Note Exemption
City of Lake Forest	Tuesday & Friday & Saturday or Sunday	Tuesday or Friday & Saturday or Sunday	Prohibited – Note Exemption

Appendix C

ETWD Water Conservation & Water Shortage Ordinance Provisions
Best Practices for the Construction and Operations of Pools and Spas

Implementation of the following Best Practices is encouraged for the construction and operation of any pool or spa installation on the premises of the private residences:

Construction:

- Installation of a pool/spa cover or use of cover elements over 75% of the pool surface to reduce evaporation

Operational:

- Installation of a cartridge filtering system to reduce the waste associated with backwash of filters
- Installation of non-mechanical, sensor-based automatic manual or timer-based fill mechanisms to prevent over-filling and waste
- Showing demonstrable off-sets to long-term water use by pool decking and surrounding landscaping compared to traditional landscape.

APPENDIX D

Notification of Public and Service Area Suppliers

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

March 29, 2016

Mr. David Doyle
City of Aliso Viejo
City Manager
12 Journey Street, Suite 100
Aliso Viejo, CA 92656

Attn: Mr. Doyle

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Doyle,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify your agency that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If your agency would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

March 16, 2016

Mr. Hugh Nguyen
County of Orange County
Clerk-Recorder
12 Civic Center Plaza, Room 101
Santa Ana, CA 92701

Attn: Mr. Hugh Nguyen

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Nguyen,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify the County that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If the County would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

March 16, 2016

Mr. Bruce Channing
City of Laguna Hills
City Manager
24035 El Toro Road
Laguna Hills, CA 92653

Attn: Mr. Channing

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Channing,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify your agency that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If your agency would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

March 16, 2016

Mr. Doug Reily
City of Laguna Woods
Assistant City Manager
24264 El Toro Road
Laguna Woods, CA 92637

Attn: Mr. Reily

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Reily,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify your agency that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If your agency would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

March 16, 2016

Mr. Robert Dunek
City of Lake Forest
City Manager
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Attn: Mr. Dunek

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Dunek,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify your agency that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If your agency would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

Board of Directors
M. Scott Goldman
William H. Kahn
Jose F. Vergara
Frederick J. Adjarian
Mark L. Monin

General Manager
Robert R. Hill

March 16, 2016

Mr. Dennis Wilberg
City of Mission Viejo
City Manager
200 Civic Center
Mission Viejo, CA 92691

Attn: Mr. Wilberg

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Wilberg,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify your agency that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If your agency would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

Board of Directors
M. Scott Goldman
William H. Kahn
Jose F. Vergara
Frederick J. Adjarian
Mark L. Monin

General Manager
Robert R. Hill

March 16, 2016

Mr. Rob Hunter
Municipal Water District of Orange County
General Manager
P.O. Box 20895
Fountain Valley, CA 92708

Attn: Mr. Rob Hunter

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Mr. Hunter,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify MWDOC that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If MWDOC would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

El Toro Water District

"A District of Distinction"

Serving the Public – Respecting the Environment

March 16, 2016

Ms. Betty Burnett
South Orange County Wastewater Authority
General Manager
34156 Del Obispo Street
Dana Point, CA 92629

Attn: Ms. Betty Burnett

Re: Notice of Preparation of El Toro Water District's 2015 Urban Water Management Plan

Dear Ms. Burnett,

The El Toro Water District (District) is in the process of preparing its 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

This letter is intended to notify SOCWA that the District is in the process of preparing the 2015 UWMP. Based on the District's current schedule, a draft will be available for review prior to the public hearing, which is tentatively scheduled for May 26, 2016.

If SOCWA would like more information or have any questions, please direct any inquiries to:

Bobby Young
Project Engineer
949-837-7050 x247
byoung@etwd.com

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

05/12, 05/19/2016

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: May 19, 2016

David Ward

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the Board of Directors of El Toro Water District will hold a public hearing to provide opportunity for public input on the draft update of the El Toro Water District's 2015 Urban Water Management Plan (UWMP). UWMPs are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to prepare an UWMP every five years.

NOTICE IS HEREBY FURTHER GIVEN that said public hearing will be held on May 26, 2016, at 7:30 a.m. in the Board Room, 24251 Los Alisos Blvd, Lake Forest, CA 92630, at which time and place any and all persons interested may appear and be heard thereon. A copy of the draft UWMP is currently available for public review on the District's Website. For information please contact Dennis P. Cafferty at (949) 837-7050 Ext. 223. R-738
Publish: Orange County Register May 12, 19, 2016 10158926

APPENDIX E

Adopted UWMP Resolution

RESOLUTION NO. 16-5-1

RESOLUTION OF THE BOARD OF DIRECTORS OF THE EL TORO WATER DISTRICT ADOPTING THE DISTRICT'S UPDATED 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act) require every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet (AF) of water annually to prepare, adopt, and file with the Department of Water Resources (DWR) every five years in the years ending in zero and five;

WHEREAS, the updated 2015 Urban Water Management Plan is due to DWR by July 1, 2016;

WHEREAS, since its passage in 1983, several amendments have been made to the Act, the most recent in 2015 being related to provisions in SBx7-7, SB 1087 (2005) and SB 1420 (2014);

WHEREAS, the District's 2015 Urban Water Management Plan updates the 2010 Urban Water Management Plan in compliance with the requirements of the Act as amended in 2015, and includes a discussion of:

- Water Service Area and Facilities
- Water Sources and Supplies
- Water Use by Customer Type
- Demand Management Measures
- Water Supply Reliability
- Planned Water Supply Projects and Programs
- Water Shortage Contingency Plan, and
- Recycled Water Use

WHEREAS, the El Toro Water District has prepared and made available for public review, its 2015 Urban Water Management Plan. In furtherance of its adoption, a properly noticed public hearing regarding said Plan was held by the Board of Directors on May 26, 2016;

NOW, THEREFORE, BE IT RESOLVED, that the El Toro Water District hereby adopts its 2015 Urban Water Management Plan which is attached hereto, marked Exhibit "A", and by this reference is incorporated herein as though set forth in full.

ADOPTED, SIGNED AND APPROVED this 26th day of May, 2016.

M. SCOTT GOLDMAN, President
El Toro Water District and of the
Board of Directors thereof

(SEAL)

ATTEST

ROBERT R. HILL, Secretary
El Toro Water District and of the
Board of Directors thereof

STATE OF CALIFORNIA)
)
COUNTY OF ORANGE)

I, ROBERT R. HILL, Secretary of the Board of Directors of the El Toro Water District, do hereby certify that the attached is a full, true and correct copy of Resolution No. 16-5-1 of said Board, and that the same has not been amended or repealed.

DATED: May 26, 2016

ROBERT R. HILL, Secretary
El Toro Water District and of the
Board of Directors thereof

(SEAL)

APPENDIX F

Bump Methodology

Final Technical Memorandum #1

To: *Karl Seckel, Assistant Manager/District Engineer*
Municipal Water District of Orange County

From: *Dan Rodrigo, Senior Vice President, CDM Smith*

Date: *April 20, 2016*

Subject: Orange County Reliability Study, Water Demand Forecast and Supply Gap Analysis

1.0 Introduction

In December 2014, the Municipal Water District of Orange County (MWDOC) initiated the Orange County Reliability Study (OC Study) to comprehensively evaluate current and future water supply and system reliability for all of Orange County. To estimate the range of potential water supply gap (difference between forecasted water demands and all available water supplies), CDM Smith developed an OC Water Supply Simulation Model (OC Model) using the commercially available Water Evaluation and Planning (WEAP) software. WEAP is a simulation model maintained by the Stockholm Environment Institute (http://www.sei-us.org/weap) that is used by water agencies around the globe for water supply planning, including the California Department of Water Resources.

The OC Model uses indexed-sequential simulation to compare water demands and supplies now and into the future. For all components of the simulation (e.g., water demands, regional and local supplies) the OC Model maintains a given index (e.g., the year 1990 is the same for regional water demands, as well as supply from Northern California and Colorado River) and the sequence of historical hydrology. The planning horizon of the model is from 2015 to 2040 (25 years). Using the historical hydrology from 1922 to 2014, 93 separate 25-year sequences are used to generate data on reliability and ending period storage/overdraft. For example, sequence one of the simulation maps historical hydrologic year 1922 to forecast year 2015, then 1923 maps to 2016 … and 1947 maps to 2040. Sequence two shifts this one year, so 1923 maps to 2015 … and 1948 maps to 2040.

The OC Model estimates overall supply reliability for MET using a similar approach that MET has utilized in its 2015 Draft Integrated Resources Plan (MET IRP). The model then allocates available imported water to Orange County for direct and replenishment needs. Within Orange County, the OC Model simulates water demands and local supplies for three areas: (1) Brea/La Habra; (2) Orange County Basin; (3) South County; plus a Total OC summary (see Figure 1).

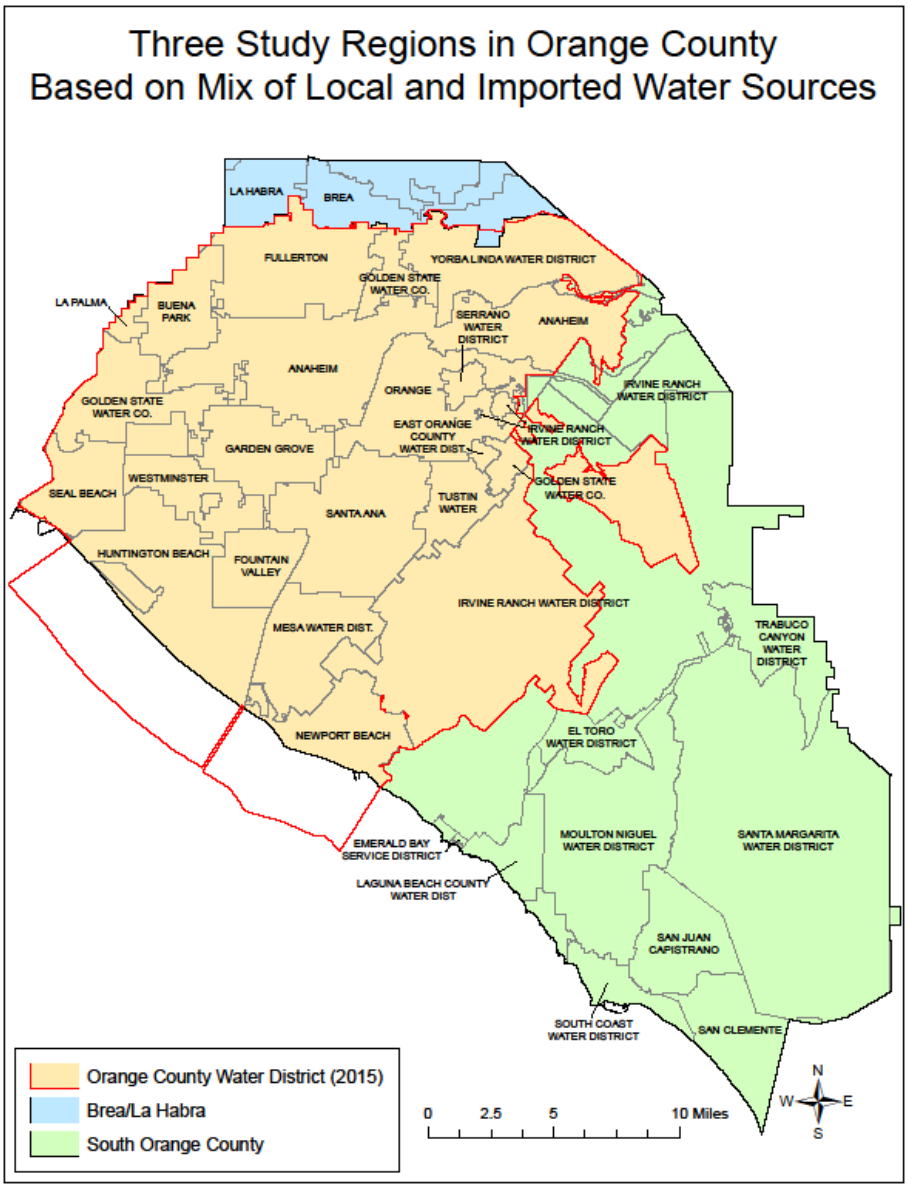


Figure 1. Geographic Areas for OC Study

The OC Model also simulates operations of the Orange County Groundwater Basin (OC Basin) managed by the Orange County Water District (OCWD). Figure 2 presents the overall model schematic for the OC Model, while Figure 3 presents the inflows and pumping variables included in the OC Basin component of the OC Model. A detailed description of the OC Model, its inputs, and all technical calculations is documented in Technical Memorandum #2: Development of OC Supply Simulation Model.

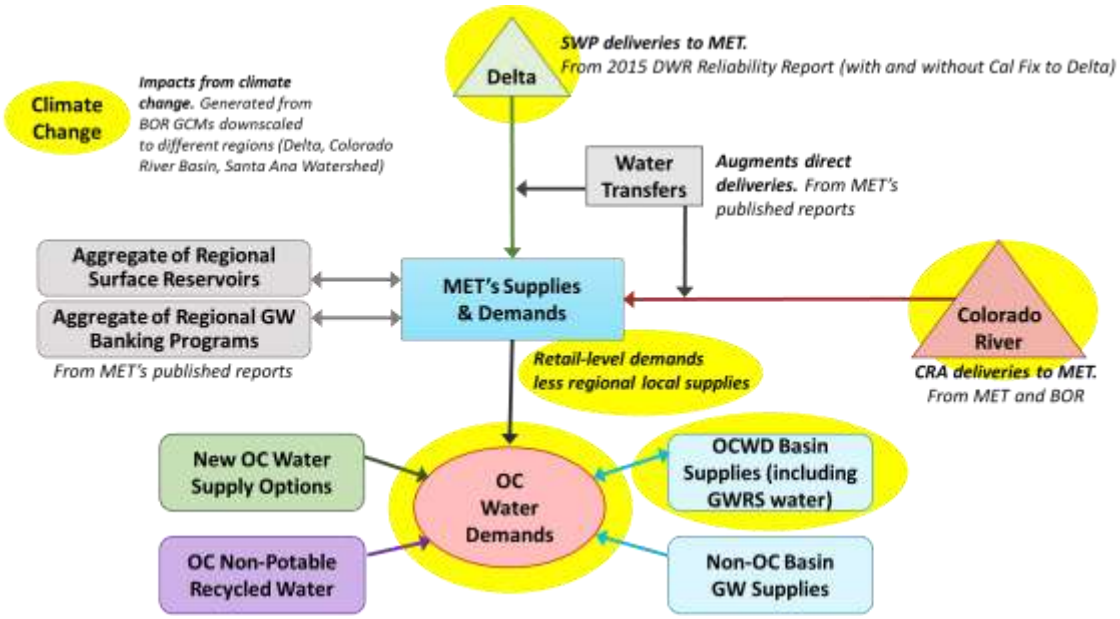


Figure 2. Overall Schematic for OC Model

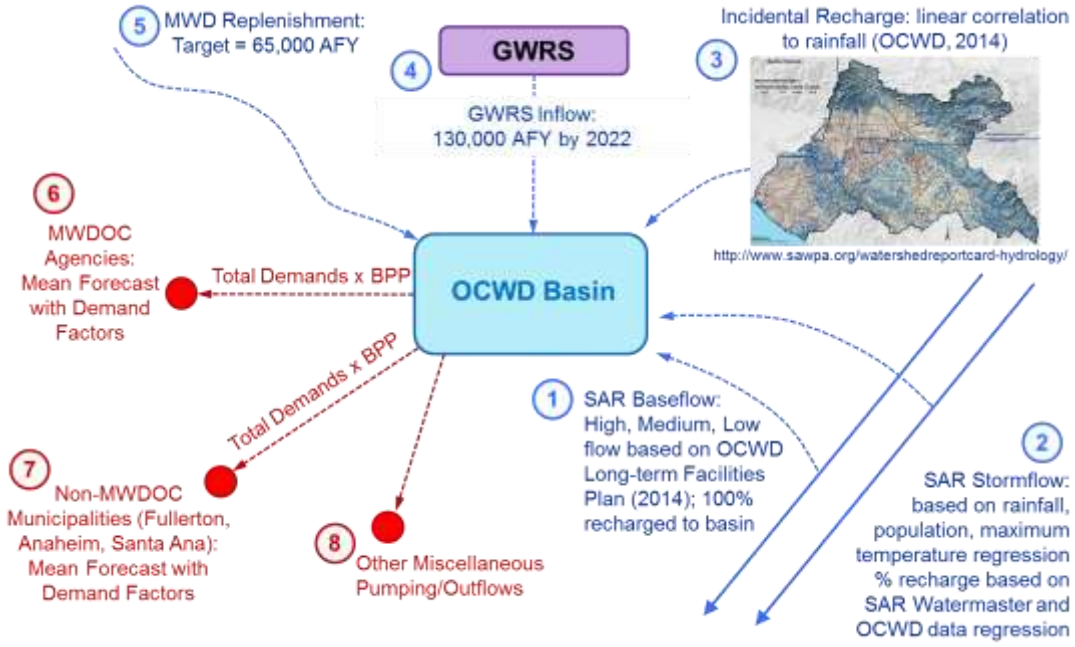


Figure 3. Inflows and Pumping Variables for OC Basin Component of OC Model

The modeling part of this evaluation is a necessity to deal with the number of issues impacting water supply reliability to Orange County. Reliability improvements in Orange County can occur due to water supply investments made by MET, the MET member agencies outside of Orange County, or by Orange County agencies. In this sense, future decision-making regarding reliability of supplies should not take place in a vacuum, but should consider the implications of decisions being made at all levels.

This technical memorandum summarizes the water demand forecast for Orange County and the water supply gap analysis that was generated using the OC Model. The outline for this technical memorandum is as follows:

- Section 1: Water Demand Forecast for Orange County
- Section 2: Planning Scenarios
- Section 3: Water Supply Gap
- Section 4: Conclusions
- Section 5: References

2.0 Water Demand Forecast for Orange County

The methodology for the water demand forecast uses a modified water unit use approach. In this approach, water unit use factors are derived from a baseline condition using a sample of water agency billing data and demographic data. In early 2015, a survey was sent by MWDOC to all water agencies in Orange County requesting Fiscal Year (FY) 2013-14 water use by billing category (e.g., single-family residential, multifamily residential, and non-residential). In parallel, the Center for Demographic Research (CDR) in Orange County provided current and projected demographics for each water agency in Orange County using GIS shape files of agency service areas. Water agencies were then placed into their respective areas (Brea/La Habra, OC Basin, South County), and water use by billing category were summed and divided by the relevant demographic (e.g., single-family water use ÷ single-family households) in order to get a water unit use factor (expressed as gallons per day/demographic unit).

In addition, the water agency survey collected information on total water production. Where provided, the difference between total water production and billed water use is considered non-revenue water. Table 1 summarizes the results of the water agency survey information and calculates the water unit use factors for the three areas within Orange County.

Table 1. Water Use Factors from Survey of Water Agencies in Orange County (FY 2013-14)

	SF Res		MF Res		Com/Instit.		Indust.		Non Revenue	
	Units[1]	Unit Use[2]	Units	Unit Use	Units	Unit Use	Units	Unit Use	total acc	%
Basin Area										
ANAHEIM	50,030	441	58,618	193	169,902	90	19,260	160	63,004	7%
BUENA PARK	16,455	346	8,600	224	31,566	137	4,837	39	19,004	11%
FOUNTAIN VALLEY	12,713	336	6,964	141	30,282	124	2,093	134	17,149	13%
FULLERTON	26,274	454	22,575	176	60,839	115	6,251	398	31,557	5%
GARDEN GROVE	31,400	422	17,580	295	48,394	134	7,221	163	No data	
GSWC	38,038	383	17,218	215	58,901	122	6,857	68		
HUNTINGTON BEACH	44,605	297	35,964	154	69,266	99	10,355	58	52,855	6%
IRVINE RANCH WATER DISTRICT	39,182	444	80,854	196	263,393	80	39,484	207	85,508	9%
MESA WATER DISTRICT	16,585	320	23,173	215	80,999	97	4,832	87	No data	
NEWPORT BEACH	19,455	329	15,517	177	59,754	86			26,517	5%
ORANGE	28,545	470	15,483	246	96,606	97	No data		35,363	9%
SANTA ANA	35,547	461	42,027	288	151,008	96			No data	
TUSTIN	11,788	505	9,435	253	25,265	79	1,293	92	14,178	3%
WESTMINSTER	17,648	318	10,973	215	24,148	109	976	84	20,379	5%
YORBA LINDA WATER DISTRICT	22,046	586	3,746	249	22,164	120	2,745	230	No data	
Weighted Average		**411**		**211**		**97**		**167**		**7.3%**
South County										
IRVINE RANCH WATER DISTRICT	16,581	444	12,864	196	32,554	80			22,730	9%
MOULTON NIGUEL WATER DISTRICT	47,673	345	17,077	189	70,067	156	Included in		55,149	10%
SAN CLEMENTE	12,047	361	9,045	186	22,921	119	commerical/		No data	
SAN JUAN CAPISTRANO	7,176	502	6,146	206	16,483	158	institutional		11,277	3%
SANTA MARGARITA WATER DISTRICT	36,022	436	19,885	268	37,241	254	category		54,129	2%
Weighted Average		**397**		**216**		**158**				**65%**
Brea/La Habra										
BREA	9,094	425	6,898	160	42,654	93	5,931	140	No data	
LA HABRA	11,995	436	8,051	177	17,331	90	680	135	13,674	6%
Weighted Average		**431.06**		**169.31**		**92.13**		**139.49**		**6%**

[1]Units represent:
SF Res = SF accounts or SF housing (CDR) if SF account data looks questionable.
MF Res = total housing (CDR) minus SF units.
Com/Instit = total employment (CDR) minus industrial employment (CDR).
Industrial = industrial employment (CDR).

[2]Unit Use represents billed water consumption (gallons/day) divided by units.

To understand the historical variation in water use and to isolate the impacts that weather and future climate has on water demand, a statistical model of monthly water production was developed. The explanatory variables used for this statistical model included population, temperature, precipitation, unemployment rate, presence of mandatory drought restrictions on water use, and a cumulative measure of passive and active conservation. Figure 4 presents the results of the statistical model for the three areas and the total county. All models had relatively high correlations and good significance in explanatory variables. Figure 5 shows how well the statistical model performs using the OC Basin model as an example. In this figure, the solid blue line represents actual per capita water use for the Basin area, while the dashed black line represents what the statistical model predicts per capita water use to be based on the explanatory variables.

Using the statistical model, each explanatory variable (e.g., weather) can be isolated to determine the impact it has on water use. Figure 6 presents the impacts on water use that key explanatory variables have in Orange County.

Regression Parameters	Basin Area	South Orange County	Brea / La Habra	OC Total
Adjusted R^2 *	0.90	0.91	0.89	0.91
Standard Error **	0.07	0.09	0.09	0.07
Explanatory Variable Significance***	All at <0.0001	All at <0.0001	All at <0.0001	All at <0.0001

* Adjusted R^2 greater than 0.70 considered good overall correlation.
** Standard Errors less than 0.10 considered good overall predictive models.
*** Explanatory Variables are considered statistically significant (valid) at the 0.05 level or less.

Figure 4. Results of Statistical Regression of Monthly Water Production

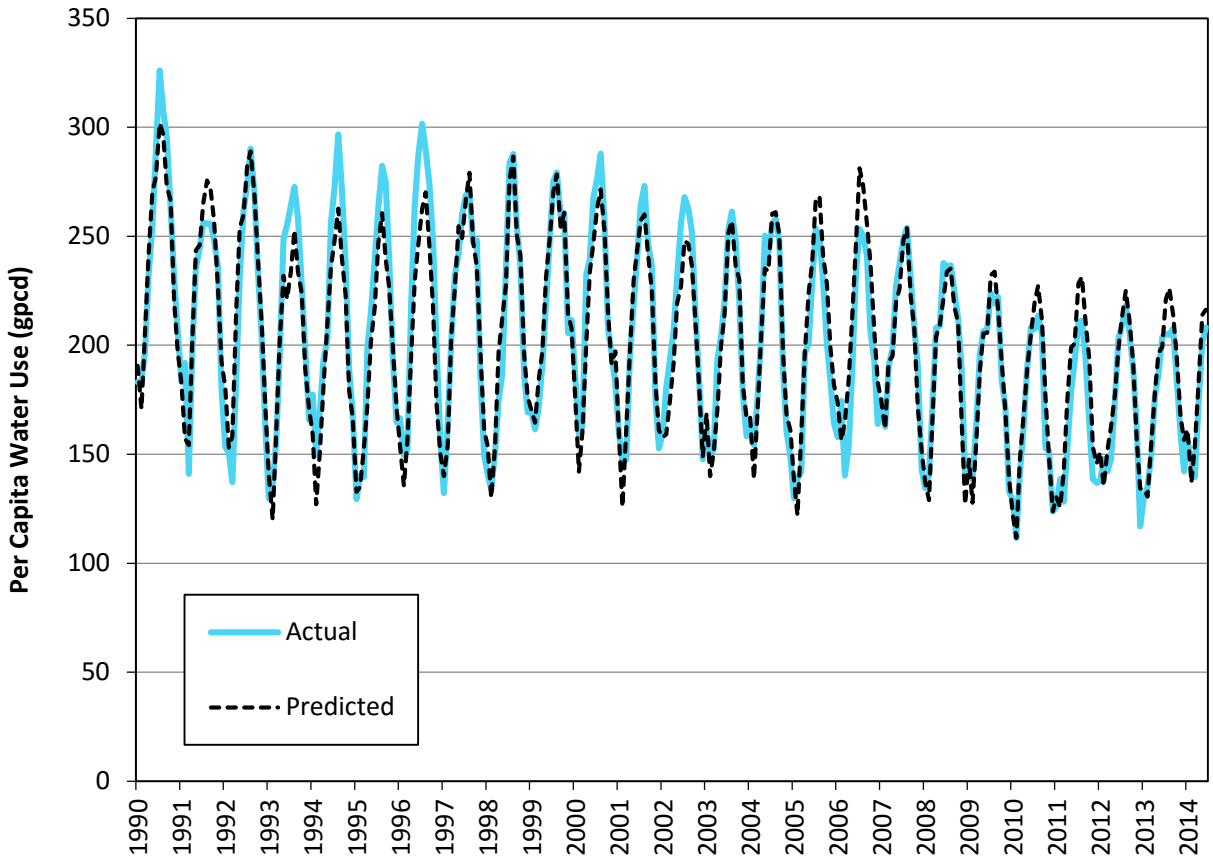


Figure 5. Verification of Statistical Water Use Model

Impacts (% impact on per capita use)	Basin Area	South Orange County	Brea / La Habra	OC Total
Hot/Dry Weather*	+6%	+9%	+6%	+6%
Cool/Wet Weather**	-4%	-7%	-5%	-5%
Economic Recession***	-13%	-12%	-13%	-13%
Drought Conservation	-6%	-5%	-5%	-6%
Passive/Active Cons. (Since 1990)	-20%	-17%	-7%	-19%

*FY 2013-14 for Hot/Dry Weather, relative to average (1990-2014).
**FY 1997-98 for Cool/Wet Weather, relative to average (1990-2014).
*** Comparing unemployment for FY 2009-10 to average (1990-2014).

Figure 6. Impacts of Key Variables on Water Use

2.1 Base Demand Forecast (No Additional Conservation post 2014)

For the purposes of this analysis three types of water conservation were defined. The first type is passive conservation, which results from codes and ordinances, such plumbing codes or model landscape water efficient ordinances. This type of conservation requires no financial incentives and grows over time based on new housing stock and remodeling of existing homes. The second type is active conservation, which requires incentives for participation. The SoCal Water$mart grant that is administered by MET, through its member agencies, provides financial incentives for approved active water conservation programs such as high efficiency toilets and clothes washer retrofits. The third type is extraordinary conservation that results from mandatory restrictions on water use during extreme droughts. This type of conservation is mainly behavioral, in that water customers change how and when they use water in response to the mandatory restrictions. In droughts past, this type of extraordinary conservation has completely dissipated once water use restrictions were lifted—in other words curtailed water demands fully "bounced back" (returned) to pre-curtailment use levels (higher demand levels, within a relatively short period of time (1-2 years).

The great California Drought, which started around 2010, has been one of the worst droughts on record. It has been unique in that for the last two years most of the state has been classified as extreme drought conditions. In response to this epic drought, Governor Jerry Brown instituted the first-ever statewide call for mandatory water use restrictions in April 2015, with a target reduction of 25 percent. Water customers across the state responded to this mandate, with most water agencies seeing water demands reduced by 15 to 30 percent during the summer of 2015. Water agencies in Southern California also ramped up incentives for turf removal during this time. Because of the unprecedented nature of the drought, the statewide call for mandatory water use restrictions, and the success of turf removal incentives it was assumed that the bounce back in water use after water use restrictions are lifted would take longer and not fully recover. For this study, it was assumed (hypothesized) that unit use rates would take 5 years to get to 85 percent

and 10 years to get to 90 percent of pre-drought water use levels. After 10 years, it was assumed that water unit use rates would remain at 90 percent of pre-drought use levels throughout the planning period—reflecting a long-term shift in water demands. Table 2 presents the assumed bounce back in water unit use rates (derived from Table 1) for this drought.

Table 2. Bounce Back in Water Unit Use from Great California Drought

Water Billing Sector	Time Period	Brea/La Habra Unit Use (gal/day)	OC Basin Unit Use (gal/day)	South County Unit Use (gal/day)
Single-Family Residential	2015	431	411	397
	2020	366	349	337
	2025 to 2040	388	369	357
Multifamily Residential	2015	169	211	216
	2020	144	179	183
	2025 to 2040	152	190	194
Commercial *(or combined commercial/ industrial for South County)*	2015	92	97	158
	2020	78	83	134
	2025 to 2040	83	87	142
Industrial	2015	139	167	NA
	2020	119	142	NA
	2025 to 2040	126	150	NA

* Units for single-family and multifamily are households, units for commercial and industrial are employment.

Table 3 presents the demographic projections from CDR for the three areas. These projections were made right after the most severe economic recession in the United States and might be considered low given that fact. In fact, *draft* 2015 demographic forecasts do show higher numbers for 2040.

Table 3. Demographic Projections

Demographic	Time Period	Brea/La Habra	OC Basin	South County	Total Orange County
Single-Family Housing	2020	20,463	386,324	133,989	540,776
	2030	20,470	389,734	138,709	548,913
	2040	20,512	392,387	142,008	554,907
Multifamily Housing	2020	18,561	453,758	118,306	590,625
	2030	19,113	468,972	125,030	613,115
	2040	19,585	478,362	126,736	624,683
Commercial Employment *(or combined commercial/ industrial employment for South County)*	2020	63,909	1,254,415	255,050	1,573,374
	2030	64,961	1,304,353	266,553	1,635,867
	2040	65,743	1,343,509	271,808	1,681,060
Industrial Employment	2020	6,583	138,474	NA	145,057
	2030	6,552	137,763	NA	144,315
	2040	6,523	137,066	NA	143,589

To determine the water demand forecast with no additional (post 2014) water conservation, the water unit use factors in Table 2 are multiplied by the demographic projections in Table 3; then a non-revenue percentage is added to account for total water use (see Table 1 for non-revenue water percentage). These should be considered normal weather water demands. Using the statistical results shown back in Figure 4, demands during dry years would be 6 to 9 percent greater; while during wet years demands would be 4 to 7 percent lower. Table 4 summarizes the demand forecast with no additional conservation post 2014. In year 2040, the water demand with no additional conservation for the total county is forecasted to be 617,466 acre-feet per year (afy). In 2014, the actual county water demand was 609,836; in 2015, the demand was 554,339 and the projected forecast for 2016 is 463,890. This represents a total water demand growth of only 1.25 percent from 2014 to 2040. In contrast, total number of households for the county is projected to increase 4.24 percent for the same period; while county employment is projected to increase by 6.22 percent.

Table 4. Normal Weather Water Demand Forecast with No Additional Conservation Post 2014

Brea / La Habra

	Baseline Demand Forecast (no new conservation)					
	SF AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total AFY
2015	9,404	3,140	6,190	1,033	1,186	20,953
2020	8,397	2,992	5,605	874	1,072	18,941
2025	8,894	3,262	6,033	921	1,147	20,257
2030	8,913	3,342	6,105	917	1,157	20,434
2035	8,913	3,501	6,163	913	1,169	20,659
2040	8,919	3,513	6,205	909	1,173	20,719

South County

	Baseline Demand Forecast (no new conservation)					
	SF AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total AFY
2015	56,181	26,940	41,990		7,507	132,616
2020	50,644	24,300	38,355		6,798	120,097
2025	55,512	27,191	42,443		7,509	132,655
2030	56,832	27,562	43,280		7,660	135,335
2035	57,350	27,884	43,970		7,752	136,956
2040	57,635	28,047	44,459		7,809	137,950

OC Basin

	Baseline Demand Forecast (no new conservation)					
	SF AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total AFY
2015	175,544	100,997	127,252	26,027	30,087	459,907
2020	150,978	91,182	116,082	22,015	26,618	406,874
2025	161,270	99,782	127,803	23,190	28,843	440,889
2030	162,368	101,780	131,640	23,073	29,320	448,181
2035	162,772	103,766	134,543	22,958	29,683	453,722
2040	162,969	105,890	137,083	22,840	30,015	458,797

Total Orange County

	Baseline Demand Forecast (no new conservation)					
	SF AFY	MF AFY	COM AFY	IND AFY	Non Rev AFY	Total AFY
2015	241,129	131,076	175,431	27,059	38,780	613,476
2020	210,019	118,473	160,042	22,889	34,488	545,911
2025	225,676	130,236	176,279	24,111	37,499	593,801
2030	228,113	132,685	181,025	23,990	38,137	603,950
2035	229,034	135,151	184,676	23,871	38,604	611,338
2040	229,524	137,450	187,747	23,750	38,996	617,466

2.2 Future Passive and Baseline Active Water Conservation

2.2.1 Future Passive Water Conservation

The following future passive water conservation estimates were made:

- High efficiency toilets – affecting new homes and businesses (post 2015) and remodels
- High efficiency clothes washers – affecting new homes (post 2015)
- Model Water Efficient Landscape Ordinance – affecting new homes and businesses (post 2015)

High Efficiency Toilets

A toilet stock model was built tracking different flush rates over time. All new homes (post 2015) are assumed to have one gallon per flush toilets. This model also assumes a certain amount of turn-over of older toilets due to life of toilet and remodeling rates. This analyses was done for single-family, multifamily and non-residential sectors. The following assumptions were made:

- Number of toilet flushes is 5.5 per person per day for single-family and multifamily homes.
- Household size is calculated from CDR data on persons per home. In single-family, household size decreases over time.
- Number of toilet flushes is 2.5 per employee per day for non-residential.
- Replacement/remodeling rates are 7% per year for 5 gal/flush toilet; 6% per year for 3.5 gal/flush toilets; and 5% per year for 1.6 gal/flush toilets.

Table 5 shows this toilet stock model for the OC Basin for single-family and non-residential sectors as an example.

Table 5. Toilet Stock Model for OC Basin (example)

OC Basin Single-Family										
#		Total	Portion of Homes with Gal/Flush Toilets						Savings	Savings
Flushes	Year	Housing	7	5	3.5	1.6	1	Av Flush	(GPD/H)	(AFY)
17.40	2000	348,114	3,133	53,261	123,232	168,487	-	2.84		
17.40	2013	379,999	-	4,794	27,111	348,094	-	1.78		
17.40	2015	381,806	-	4,122	23,858	313,285	40,541	1.69		
17.37	2020	386,324	-	2,680	16,700	234,964	131,980	1.50	3.32	1,435
17.31	2025	389,734	-	-	11,690	176,223	201,821	1.35	5.98	2,610
17.23	2030	392,387	-	-	8,183	132,167	252,037	1.25	7.54	3,312
17.14	2035	393,363	-	-	5,728	99,125	288,509	1.19	8.64	3,806
17.05	2040	393,840	-	-	4,010	74,344	315,486	1.14	9.43	4,159

OC Basin Non-Residential										
#			Portion of Emp with Gal/Flush Toilets						Savings	Savings
Flushes	Year	Empl	7	5	3.5	1.6	1	Av Flush	(GPD/E)	(AFY)
3,298,440	2015	1,319,376	-	13,194	131,938	461,782	712,463	1.50		
3,510,508	2020	1,404,203	-	8,576	92,356	346,336	956,935	1.34	0.41	641
3,633,438	2025	1,453,375	-	5,574	64,649	259,752	1,123,399	1.23	0.67	1,083
3,729,448	2030	1,491,779	-	3,623	45,255	194,814	1,248,087	1.16	0.84	1,404
3,801,693	2035	1,520,677	-	2,355	31,678	146,111	1,340,533	1.12	0.96	1,635
3,864,600	2040	1,545,840	-	1,531	22,175	109,583	1,412,551	1.08	1.04	1,808

High Efficiency Clothes Washers

It was assumed that all new clothes washers sold after 2015 would be high efficiency and roughly save 0.033 afy per washer[1]. These savings would only apply to new homes (post 2015), and only for the single-family sector.

Model Water Efficient Landscape Ordinance (2015)

The new California Model Water Efficient Landscape Ordinance (MWELO) will take place in 2016. For single-family and multifamily homes it will require that 75 percent of the irrigable area be California Friendly landscaping with high efficiency irrigation systems, with an allowance that the remaining 25 percent can be turf (high water using landscape). For non-residential establishments it will require 100 percent of the irrigable area to be California Friendly landscaping with high efficiency irrigation systems (and no turf areas). There are exemptions for non-potable recycled water systems and for parks and open space. To calculate the savings from this ordinance a parcel database provided by MWDOC was analyzed. This database had the total irrigable area and turf area delineated for current parcels. For each parcel, a target water savings was set depending on the sector. For residential parcels, 25 percent of the total irrigable area was assumed to be turf and the savings from a non-compliant parcel was estimated. For each square feet of turf conversion the estimate savings is 0.00013 afy[1]. Table 6 summarizes the per parcel savings for the total county using this method.

Table 6. Estimated Parcel Savings from MWELO for Total Orange County

Parcel Type	Number of Parcels	Total Irrigable Area (sq. feet)	Current Turf Area (sq. feet)	Turf Conversion (sq. feet)*	Turf Conversion (sq. ft / parcel)	Conservation Savings (afy/parcel)
Single-Family Residential	527,627	2,114,679,368	897,177,779	368,507,937	698	0.091
Multifamily Residential	555,255	155,315,983	51,697,361	12,868,365	23	0.003
Businesses (Non-Residential)	1,623,307	499,127,269	212,043,667	212,043,667	131	0.017

* Assumes 25% turf conversion for single-family and multifamily, and 100% for businesses.

The conservation savings in afy/parcel where then multiplied by new homes and businesses (post 2015), assuming a 75 percent compliance rate.

2.2.2 Future Baseline Active Water Conservation

To estimate a baseline water savings from future active water conservation measures, the actual average annual water savings for the last seven years for the SoCal Water$mart program within Orange County were analyzed. A continuation of this program through 2040 at similar annual implementation rates was assumed to be representative of a baseline estimate for active water conservation into the future.

[1] Per MET's SoCal Water$mart conservation estimates, table provided by MWDOC (2015).

New active conservation measures or more aggressive implementation of existing active conservation will be evaluated as part of a portfolio analysis of water demand and supply options in Phase 2 of the OC Study.

2.2.3 Total Future Water Conservation Savings

Combing future passive and active water conservation results in a total estimated water savings, which is summarized in Table 7. The total passive and active conservation for the total Orange County is shown in Figure 7.

Table 7. Future Passive and Baseline Active Water Conservation Savings

Brea/La Habra Area

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELO	HEC Pass	Toilets	Active	Total	MWELO	Toilets	Active	Total	MWELO	Toilets	Active	Total
2020	186	32	78	8	304	11	51	5	67	63	32	17	112
2025	169	33	131	15	348	13	85	10	108	79	52	34	166
2030	166	34	163	30	394	16	106	20	142	91	67	68	226
2035	156	34	186	61	437	21	127	40	188	101	77	136	314
2040	149	34	203	79	465	21	137	53	211	108	85	177	370

OC Basin

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELO	HEC Pass	Toilets	Active	Total	MWELO	Toilets	Active	Total	MWELO	Toilets	Active	Total
2020	272	148	1,435	221	2,076	61	1,217	171	1,449	759	641	556	1,956
2025	430	260	2,610	441	3,742	96	2,165	342	2,603	1,199	1,083	1,112	3,394
2030	542	347	3,312	883	5,084	118	2,738	684	3,540	1,542	1,404	2,224	5,170
2035	557	379	3,806	1,766	6,509	139	3,182	1,369	4,690	1,801	1,635	4,447	7,883
2040	544	395	4,159	2,472	7,570	162	3,537	1,916	5,615	2,026	1,808	6,226	10,059

South County

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELO	HEC Pass	Toilets	Active	Total	MWELO	Toilets	Active	Total	MWELO	Toilets	Active	Total
2020	558	251	507	116	1,432	11	335	160	506	582	119	329	1,029
2025	812	406	877	232	2,326	22	599	321	942	960	202	657	1,819
2030	972	514	1,148	463	3,097	25	761	642	1,428	1,133	257	1,314	2,704
2035	990	556	1,332	927	3,805	27	876	1,283	2,187	1,275	298	2,628	4,201
2040	967	580	1,480	1,112	4,139	29	969	1,540	2,537	1,376	327	3,154	4,857

Total County

	Single-Family Savings (AFY)					Multifamily Savings (AFY)				Non-Residential Savings (AFY)			
	MWELO	HEC Pass	Toilets	Active	Total	MWELO	Toilets	Active	Total	MWELO	Toilets	Active	Total
2020	1,017	431	2,020	344	3,812	83	1,602	337	2,022	1,404	792	901	3,097
2025	1,411	698	3,618	688	6,416	132	2,848	673	3,653	2,238	1,337	1,803	5,378
2030	1,680	895	4,624	1,377	8,575	159	3,606	1,346	5,111	2,766	1,728	3,606	8,100
2035	1,704	969	5,325	2,754	10,752	188	4,185	2,692	7,065	3,177	2,010	7,212	12,399
2040	1,660	1,009	5,842	3,663	12,175	212	4,643	3,509	8,363	3,510	2,219	9,557	15,286

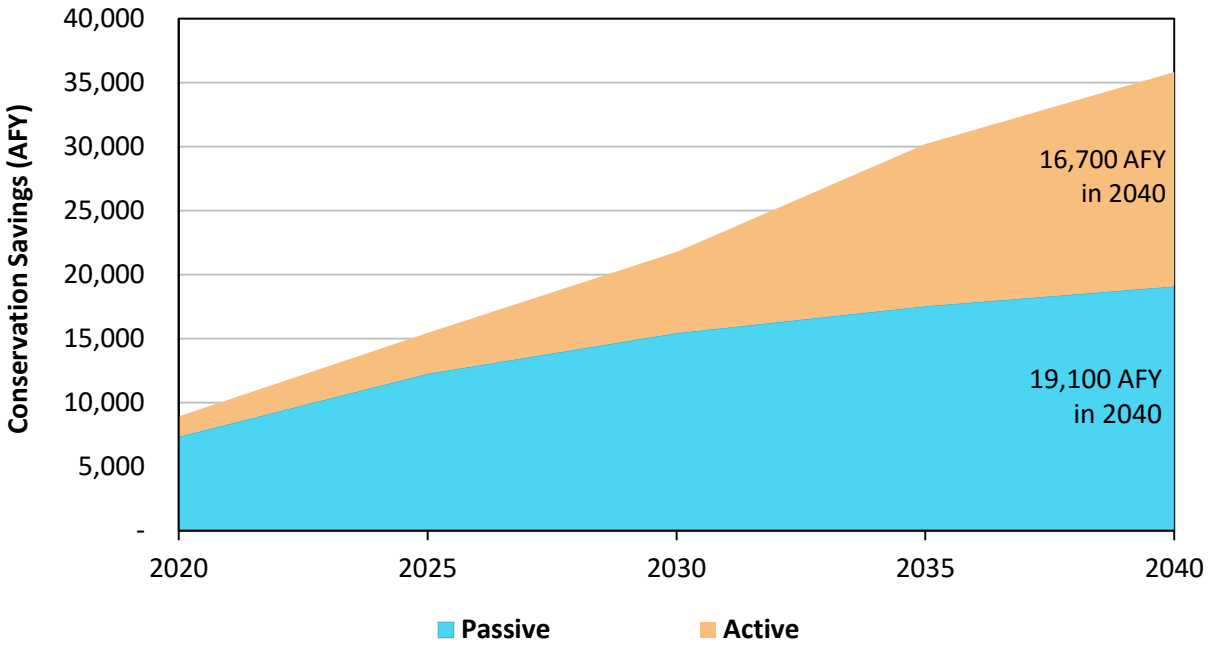


Figure 7. Total Water Conservation in Orange County

1.3 With Conservation Demand Forecast

Subtracting the future water conservation savings shown in Table 7 from the base water demand forecast shown in Table 4 results in the water demand forecast with conservation that is used to model potential water supply gaps for the OC Study. Table 8 presents the demand forecast by area and total Orange County, while Figure 8 presents the historical and forecasted water demands for total Orange County.

Note: Price elasticity of water demand reflects the impact that changes in retail cost of water has on water use. Theory states that if price goes up, customers respond by reducing water use. A price elasticity value of -0.2 implies that if the real price of water increases by 10%, water use would decrease by 2%. Price elasticity is estimated by detailed econometric water demand models, where price can be isolated from all other explanatory variables. Many times price is correlated with other variables making it difficult to estimate a significant statistical value. In addition, there is a potential for double counting reduction in water demand if estimates of future conservation from active programs are included in a demand forecast because customers who respond to price take advantage of utility-provided incentives for conservation. MET's 2015 IRP considers the impact of price elasticity in their future water demand scenarios, but does not include future active conservation in its demand forecast. The OC Study included future estimates of water conservation from active conservation, and thus did not include a price elasticity variable in its statistical modeling of water demand. Including both price elasticity and active conservation would have resulted in "double counting" of the future water savings.

Table 7. Water Demand Forecast with Conservation

Brea / La Habra

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	8,094	2,925	6,368	1,043	18,429
2025	8,546	3,154	6,789	1,109	19,598
2030	8,519	3,200	6,796	1,111	19,626
2035	8,475	3,313	6,762	1,113	19,663
2040	8,454	3,302	6,745	1,110	19,611

OC Basin

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	148,902	89,733	136,077	26,230	400,941
2025	157,528	97,180	147,532	28,157	430,396
2030	157,284	98,240	149,476	28,350	433,350
2035	156,263	99,076	149,552	28,342	433,233
2040	155,399	100,275	149,797	28,383	433,854

South County

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	49,212	23,793	37,326	6,620	116,951
2025	53,186	26,250	40,624	7,204	127,263
2030	53,735	26,135	40,575	7,227	127,672
2035	53,545	25,697	39,769	7,141	126,151
2040	53,496	25,509	39,602	7,116	125,725

Total Orange County

	With Conservation Demand				
	SF AFY	MF AFY	CII AFY	Non Rev AFY	Total AFY
2020	206,207	116,451	179,770	33,893	536,321
2025	219,260	126,583	194,945	36,470	577,257
2030	219,537	127,575	196,848	36,688	580,647
2035	218,283	128,086	196,082	36,596	579,047
2040	217,349	129,087	196,144	36,610	579,189

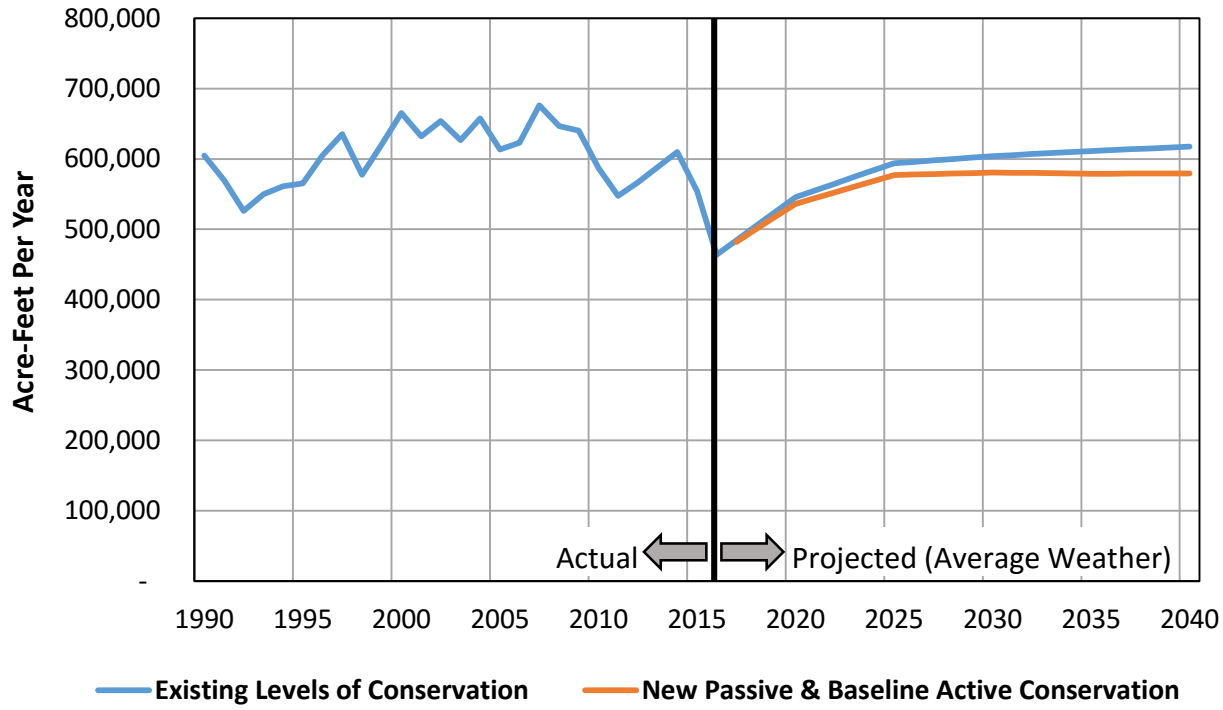


Figure 8. Water Demand Forecast for Total Orange County

3.0 Planning Scenarios

At the start of the Orange County Water Reliability Study, a workgroup was formed made up of representatives from Orange County water agencies. This OC Workgroup met 13 times during the

12-month Phase 1 of the study. During the first four meetings of the OC Workgroup, three basic planning scenarios emerged, each with and without a California WaterFix to the Delta—thus resulting in six scenarios in total. While there was discussion on assigning probabilities or weights to these planning scenarios, consensus was not reached on which scenario was more probable than the others. Assignment of the likelihood that one scenario is more probable than the others will be revisited in Phase 2 of the Orange County Reliability Study. There was, however, general agreement that all of the scenarios represent plausible future outcomes and thus all scenarios should be evaluated in terms of assessing potential water supply gaps (difference between forecasted water demands and existing water supplies). It is important to note that the purpose of estimating the water supply gaps for Orange County is to determine what additional MET and Orange County water supply investments are needed for future reliability planning. Thus, other than the California WaterFix to the Delta, all planning scenarios assume no new additional regional or Orange County water supply investments, with a couple of exceptions. In Orange County, it was assumed that existing and planned non-potable recycling projects would build additional supplies out into the future. It was also assumed that the OCWD GWRS Phase 3 expansion project would be implemented by 2022 to increase the recycled supplies for groundwater replenishment from 100,000 afy to 130,000 afy.

To develop the planning scenarios, the OC Workgroup considered the following parameters:

- California WaterFix to Sacramento-San Joaquin Delta (Cal Fix), which impacts the reliability of the State Water Project.
- Regional MET water demands and supplies, which impacts the availability of water from MET and supply reliability for Orange County.
- Orange County water demands, which impacts the supply reliability for Orange County.
- Santa Ana River baseflows, which impacts the replenishment of the OC Basin and the supply reliability for the water agencies within the OC Basin.
- Climate variability impacts on regional and local water demands and supplies, which impacts the availability of water from MET and the supply reliability for Orange County.

The definition of the six scenarios are:

- **Scenario 1a - Planned Conditions, No Cal Fix:** Essentially represents MET's IRP planning assumptions, with very little climate variability impacts (only impacting Delta supplies and not through 2040), no California Fix to the Delta, and no new regional or OC water supply investments.
- **Scenario 1b - Planned Conditions, with Cal Fix:** Same as Scenario 1a, but with new supply from the California Fix to the Delta beginning in 2030.

- **Scenario 2a - Moderately Stressed Conditions, No Cal Fix:** Moderate levels of climate variability impacts (affecting Delta, Colorado River, and Santa Ana watershed), slightly lower regional local supplies than MET assumes in IRP, 4% higher demand growth reflecting climate impacts and higher demographic growth, no California Fix to the Delta, and no new regional or OC water supply investments. The higher demand growth and fewer local supplies reflects potential future impacts if our existing demographics are low and if local supplies become more challenged, a continuation of the trend in recent times.

- **Scenario 2b - Moderately Stressed Conditions, with Cal Fix:** Same as 2a, but with new supply from California Fix to the Delta beginning in 2030.

- **Scenario 3a - Significantly Stressed Conditions, No Cal Fix:** Significant levels of climate variability impacts (affecting Delta, Colorado River, and Santa Ana watershed), 8% higher demand growth reflecting climate impacts and higher demographic growth, no California Fix to the Delta, and no new regional or OC water supply investments.

- **Scenario 3b - Significantly Stressed Conditions, with Cal Fix:** Same as 3a, but with new supply from California Fix to the Delta beginning in 2030.

All of these scenarios were deemed plausible and likely carry about the same likelihood of occurring. While no attempt was made to specifically assign the probability of any one of the six scenarios occurring over the others, some might postulate that Scenario 2 would be the most likely to occur given that most climate experts believe we are already seeing evidence of climate variability impacts today. But even with this postulation, assigning a probability to the success of the Cal Fix would be difficult at this time.

4.0 Water Supply Gap

To plan for future water supply reliability, a gap between forecasted water demands and existing supplies (plus planned projects that are a certainty) should be estimated. In past planning efforts, this gap is often done for average conditions or at best, using one reference drought condition. However, due to recent droughts and environmental restrictions in the Delta, a more sophisticated approach to estimating the potential water supply gap is needed. The OC Model, described in detail in TM #2: Development of OC Supply Simulation Model, uses "indexed-sequential" simulation to evaluate regional water demands and supplies, and Orange County water demands and supplies. All model demands and supply sources are referenced to the same hydrologic index—meaning that if a repeat of the year 1991 occurred, the OC Model would represent the availability of Delta water supplies in 1991 to MET, the availability of Colorado River water supplies in 1991 to MET, and the local Santa Ana watershed conditions in 1991. The OC Model also preserves the historical sequence of the hydrologic years. This is necessary because the source of availability of Delta and Colorado River water supplies are hydrologic models run by California Department of Water Resources (DWR) and the Bureau of Reclamation (BOR). These hydrologic models incorporate water rights (or contract rights) and storage conditions that are run using a specific sequence of hydrologic conditions. Both MET IRP and OC modeling of water supply maintain these sequences in order to

preserve the accuracy of the DWR and BOR model inputs. The hydrologic period used by the OC Model is 1922 to 2014 (which differs from MET's IRP which is 1922 to 2012). The forecast period is 2015 to 2040. Thus, in the OC Model there are 93 25-year sequences that are mapped to the forecast period. When the year 2014 is reached in any of the sequences, the next year wraps back around starting in 1922. Table 8 illustrates how the indexed-sequential method works.

Table 8. Illustration of Indexed-Sequential Supply Simulation

Forecast Year	Hydrologic Simulation Year – Sequence 1	Hydrologic Simulation Year – Sequence 2	. . .	Hydrologic Simulation Year – Sequence 93
2015	1922	1923		2014
2016	1923	1924		1922
⋮	⋮	⋮		⋮
2040	1947	1948		1946

Using the SWP system as an index, approximately 12 of the 93 historical hydrologic years (13 percent) are considered critically dry; 20 years (22 percent) are considered very wet; and the remaining 61 years (65 percent) are along the below-normal, normal, and above-normal spectrum.

4.1 Assumptions for Supply Gap Analysis

Figure 9 presents the overall assumptions for the water supply gap analysis. Figure 10 presents more specific assumptions regarding groundwater in the OC Basin. In addition to these assumptions, the following summarizes some of the differences between the MET IRP and the supply gap analysis for the OC Study:

- **Simulation Period:** MET IRP uses a historical hydrology from 1922 to 2012; while the OC Study uses a historical hydrology from 1922 to 2014—capturing the recent drought.
- **Cal Fix:** When the Cal Fix is included, MET IRP assumes that new supply from Cal Fix begins in 2020, based on the assumption that a "commitment" to move forward with the Cal Fix project will result in regulatory relief, beginning in 2020; while the OC Study assumes that supplies from Cal Fix begins when project is fully operational in 2030.
- **Water Conservation:** MET IRP only includes new passive conservation in their demand forecast (with new active conservation being reserved as a new supply option); while the OC Study assumes new passive and baseline new active conservation for water demands in Orange County (additional new active conservation will be evaluated in Phase 2 of the OC Study).

- **Climate Variability:** MET IRP only includes minimal impacts of climate variability for Delta water supplies through 2030; while the OC Study includes a range of climate scenario impacts on water supplies from Delta, Colorado River and Santa Ana Watershed through 2040.

Water Demands (AFY)	FY 2014 Actual	FY 2015 Actual	2025 Projected	2040 Projected
MET Demands*	2,300,000	1,850,000	1,920,000	2,028,000
OCWD Basin Demands**	453,000	410,000	425,000	434,000
OC Total Demands**	610,000	554,000	565,000	579,000

* With future passive conservation only ** With future passive and baseline new active conservation

OC Groundwater (AFY)	Brea/La Habra	Net OC Basin	South County	Total
Groundwater Supply	15,000*	188,500**	10,000	213,500

* Based on firm yield from La Habra Basin and groundwater purchases from Main San Gabriel Basin.
** Includes GWRS, SAR baseflows, SAR stormflows, incidental recharge, MET replenishment, and miscellaneous pumping.

OC Non-Potable Recycled Water (AFY)	2015	2040
OC Basin Recycled Water	22,000	27,700
South County Recycled Water	23,900	41,800
Total	45,900	69,500

Note: Irvine Ranch Water District (IRWD) is split between the Basin and South County

Figure 9. Overall Assumptions for Water Supply Gap Analysis

OC Basin Groundwater (AFY)	Near-Term	Long-Term	Range Within Model
Groundwater Replenishment System (GWRS)	100,000	130,000	100,000 to 130,000
SAR Baseflow (mid level assumption)	53,000	53,000	34,000 to 53,000
SAR Stormflow (average of all hydrologies)	53,000	53,000	6,000 to 150,000
SAR Incidental Recharge (average of all hydrologies)	59,000	59,000	20,000 to 140,000
MET Replenishment (average of all hydrologies)*	54,000	34,000	0 to 65,000
BEA Outflows	-22,000	-9,000	-22,000 to -9,000
Misc. Pumping (golf courses, etc.)	-8,500	-8,500	-8,500
Net Groundwater for OC Basin Agencies	**288,500**	**311,500**	**168,000 to 455,000**

* While OCWD replenishment target is 65,000 AFY, replenishment water is not assumed to be taken during very wet years when SAR stormflows are high, and only a portion of replenishment water is available during years in which MET is in allocation of imported water.

Figure 10. Assumptions for Groundwater in OC Basin

4.2 Availability of Water from MET

Key to the assessment of water reliability for Orange County is estimating the availability of imported water from MET under a wide range of scenarios. Availability of MET water to Orange County is a function of the water demands on MET and the reliability of imported water from the Colorado River and Delta to MET, supplemented by withdrawals from various MET storage accounts.

4.2.1 Demands on MET

MET water demands represent that difference between regional retail water demands (inclusive of groundwater replenishment) and regional local supplies (which includes groundwater, Los Angeles Aqueducts, surface reservoirs, groundwater recovery, recycled water, and seawater desalination). Table 9 presents the MET demand forecast under normal/average weather conditions.

A significant challenge for MET in terms of reliability planning is it represents the "swing" water supply for the region. This compounds the variability on demands on MET due to weather and hydrology. For retail water demands, variations in weather can cause water use to change ± 5 to 9 percent in any given year due to varying demands for irrigation and cooling. In addition to retail water demand variability, local supplies can vary ± 80 percent for the Los Angeles Aqueducts and ± 55 percent for surface reservoirs. Thus, the variability for demands on MET in any given year can be ± 15 to 25 percent. This fact alone makes storage so key in assuring supply reliability for MET and the region.

Table 9. Demands on MET

Total Demand (AFY)	2020	2030	2040
Retail M&I	3,707,546	3,865,200	3,954,814
Retail Agricultural	169,822	163,121	159,537
Seawater Barrier	66,500	66,500	66,500
Replenishment	292,777	272,829	272,847
Total Demand	**4,236,645**	**4,367,650**	**4,453,698**

Local Supplies (AFY)			
Groundwater Production	1,308,101	1,321,220	1,322,197
Surface Production	113,705	113,705	113,705
Los Angeles Aqueduct	261,100	264,296	267,637
Seawater Desalination	50,637	50,637	50,637
Groundwater Recovery	142,286	158,816	162,688
Recycled Water	425,131	468,862	495,698
Other Non-Metropolitan Imports	13,100	13,100	13,100
Total Local Supplies	**2,314,061**	**2,390,637**	**2,425,663**

Demand On MET (AFY)			
Consumptive Use	1,743,866	1,826,245	1,880,131
Seawater Barrier	11,635	8,708	5,877
Replenishment	167,083	142,060	142,027
Total Net Demand on Metropolitan	**1,922,584**	**1,977,013**	**2,028,035**

4.2.2 Supplies from Colorado River and Delta

MET's water supply from the Colorado River, via the Colorado River Aqueduct (CRA), has historically been the backbone to MET's supply reliability. Before the settlement agreement between lower Colorado River Basin states and water agencies that use Colorado River water within California, MET kept the CRA full at 1.2 million acre-feet (maf) per year or nearly at that level in many years. The settlement agreement requires California to live within its 4.4 maf apportionment, and dictates how Colorado River water within California is prioritized. This eliminated most of the surplus water that MET was using to keep the CRA full. To deal with this challenge, MET has developed a number of water transfers and land fallowing programs to mitigate the impacts of the settlement agreement. The 2015 MET IRP is assuming that it will maintain minimum CRA supply of 0.90 maf, with a goal of a full CRA during dry years, when needed (although it is not specified exactly how that will occur).

For the OC Study, we have assumed similar baseline assumptions as the MET IRP, but have added some uncertainties with regard to climate scenarios under Scenario 2 and more significant impacts under Scenario 3. Under significant climate scenario impacts (Scenario 3), where the BOR simulates that Lake Mead elevation would fall below 1,000 feet about 80 percent of the time, the OC Study assumed MET would get a proportionate share of shortages that are allocated by BOR. Exactly how BOR would manage water shortages when Lake Mead elevation falls below 1,000 is uncharted territory, but assuming some proportional allocation of Colorado River water among the Lower Basin states and within California is a plausible scenario. Figure 11 presents the assumed CRA water supplies to MET for the OC Study with (Scenario 3) and without (Scenarios 1 & 2) significant climate scenario impacts. Under the significant climate scenario (Scenario 3), there is a 50 percent probability that CRA deliveries would be below 815,000 afy and a 20 percent probability that CRA deliveries would be below 620,000 afy.

The other main source of imported water available to MET is from the Delta and is delivered to Southern California via the State Water Project (SWP). Although MET's contract for SWP water is 2.0 maf, it has never received that amount. Prior to the QSA (in 2003) when MET relied more heavily on CRA supplies, the maximum water taken by MET from the SWP exceeded 1.1 maf in only three years (1989, 1990 and 2000). Beginning in 2001, MET has tried to maximize their delivery of SWP water. In very wet years, MET typically receives about 1.7 maf of supply from the SWP (about 80 to 85% of their total contract). More typically, MET receives closer to 1.2 maf of supply from the SWP (about 60% of their maximum contract). Droughts and environmental regulatory restrictions in the Delta have greatly impacted the reliability of SWP supply. Biological opinions regarding endangered species not only limit Delta exports during dry years, but have greatly impacted exports during more normal years when water agencies such as MET are counting on such water for storage replenishment.

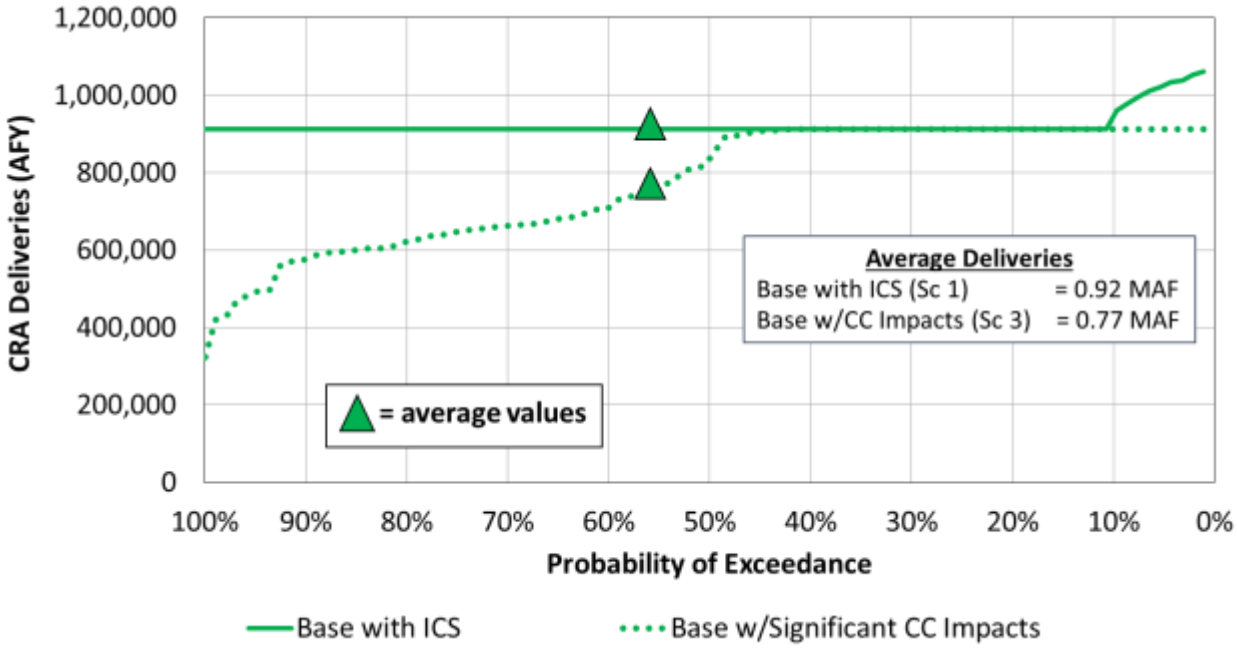


Figure 11. Colorado River Aqueduct Deliveries to MET

To stabilize the decline in SWP deliveries, California has committed to the California WaterFix (Cal Fix) and California EcoRestore. In the long-term, the preferred alternative identified in Cal Fix is expected to increase SWP deliveries (above what they otherwise would have been) by providing more flexible water diversions through improved conveyance and operations. It is important to note that the Cal Fix does not generate **NEW** water supplies per se, but allows supplies lost due to regulatory restrictions to be regained. This project would also provide much needed resiliency during seismic events in the Delta. The new conveyance and diversion facilities will allow for increased water supply reliability and a more permanent solution for flow-based environmental standards. The anticipated implementation of the Cal Fix is expected to be around 2030. Assuming a more flexible, adaptive management strategy, MET is assuming that if Cal Fix moves forward that regulatory relief from further biological opinions in the Delta would occur and SWP deliveries would return to pre-biological opinion deliveries as soon as 2020. However, some might argue this is an optimistic assumption, and there is no certainty that such relief would occur until the project is operational. Therefore for the GAP analysis, the OC Study assumed that improved SWP deliveries from Cal Fix would begin in 2030.

Climate variability can further reduce the reliability of SWP deliveries. The source of water that is pumped from the Delta originates in the Sierra Nevada Mountains as snowpack. It is widely accepted by climate and hydrology experts that climate scenario impacts on snowpack-driven water supplies is even more significant because even a fraction of a degree increase leads to early snowmelt which reduces the ability to capture river flows in surface reservoirs. Using methods described in TM#2, CDM Smith and its climate scenario expert Dr. David Yates estimated the potential impacts to the SWP under significant climate scenario. These estimates are similar to

earlier work that California DWR did on climate scenario impacts on SWP reliability. Figure 12 presents the full range of SWP deliveries to MET with and without Cal Fix and with and without significant climate scenario impacts. As shown, the Cal Fix greatly improves the reliability of SWP supplies to MET—with an average increase in supply (restoration of supplies compared to the no project alternative) of over 400,000 afy. Significant climate scenario reduces SWP deliveries by an average of 200,000 afy, even with the Cal Fix.

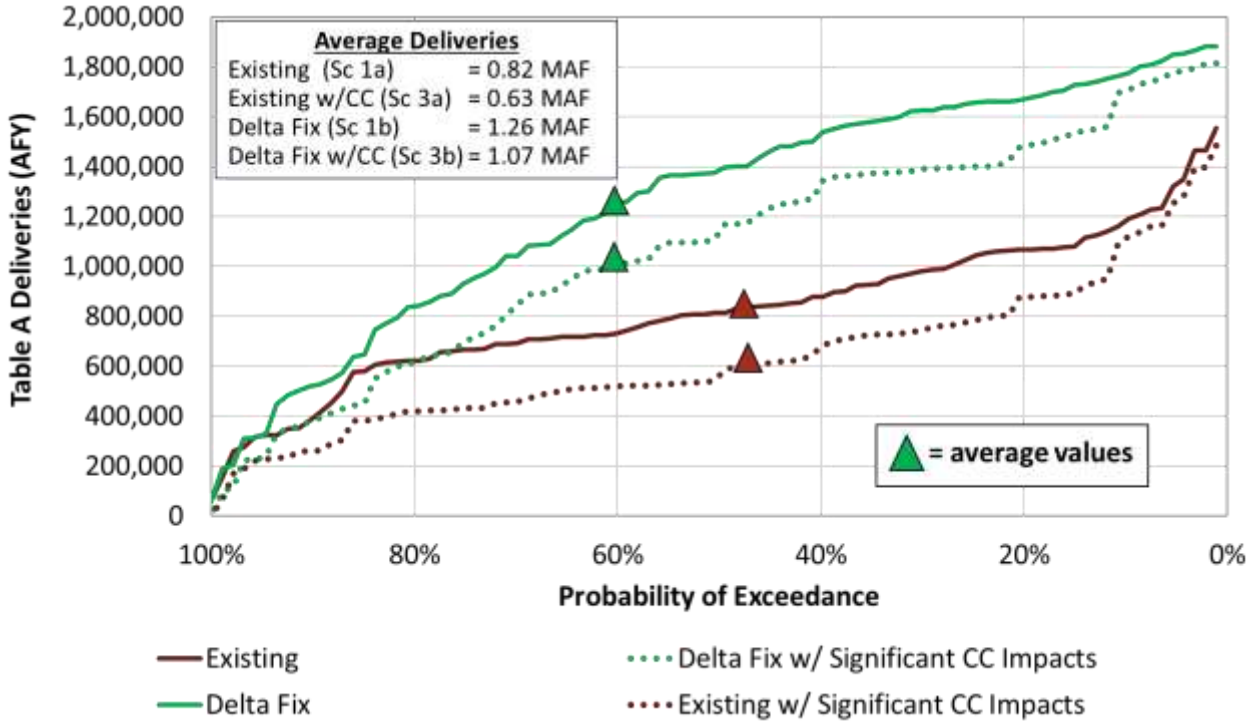


Figure 12. State Water Project Deliveries to MET

4.2.3 Overall MET Reliability

In addition to CRA and SWP water, MET has significant surface storage and groundwater storage programs. MET also has a number of water transfers in the Central Valley. These investments have been critical for the region's supply reliability during droughts. However, since the first MET IRP in 1996 MET has had to allocate its imported water to its member agencies three in the last seven years.

Using the indexed-sequential simulation method described in TM#2, MET water reliability can be illustrated for several hydrologic sequences. Figures 13, 14 and 15 utilize just 2 of the 93 hydrology sequences to demonstrate how the analysis works. Figure 13 shows the MET demands and supplies without a Cal Fix for the forecast period 2015 to 2040 with the last 25-year hydrologic sequence of 1989 to 2014 imposed. In other words, forecast year 2015 is 1989, 2016 is 1990 … and 2040 is 2014. Of all the 93 possible 25-year hydrologic sequences, this one is the worst in terms of cumulative supply shortages.

Figure 14 shows Met demands and supplies without a Cal Fix for a more normal hydrology sequence imposed on the forecast period (this sequence begins with 1950 and ends in 1975). Even with a normal hydrology, there are still some water shortages in the later years. Figure 15, shows this same hydrology (1950 to 1975) but with a Cal Fix. Under this scenario, regional storage replenishes greatly and shortages in the later years are eliminated.

When all 93 hydrologic sequences are simulated, and under all six scenarios representing various climate scenarios and Cal Fix assumptions, the probability of MET shortages exceeding 15 percent can be derived. A regional 15 percent shortage is similar to the allocation MET imposed in 2015. Figure 16 presents this probability of MET shortage. The results presented here for Scenario 1 with and without Cal Fix are similar to those presented in MET's Draft IRP.

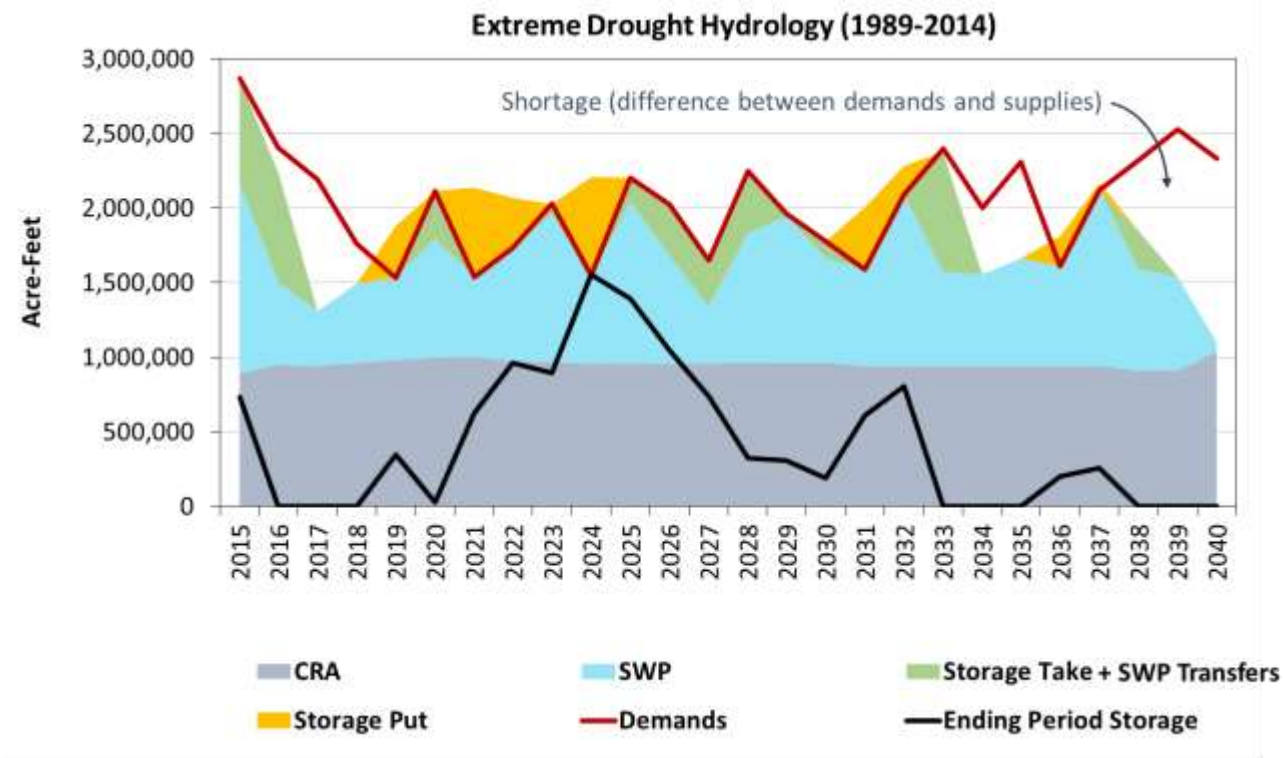


Figure 13. MET Reliability under Drought, for Scenario 1a (no Climate variability, no Cal Fix)

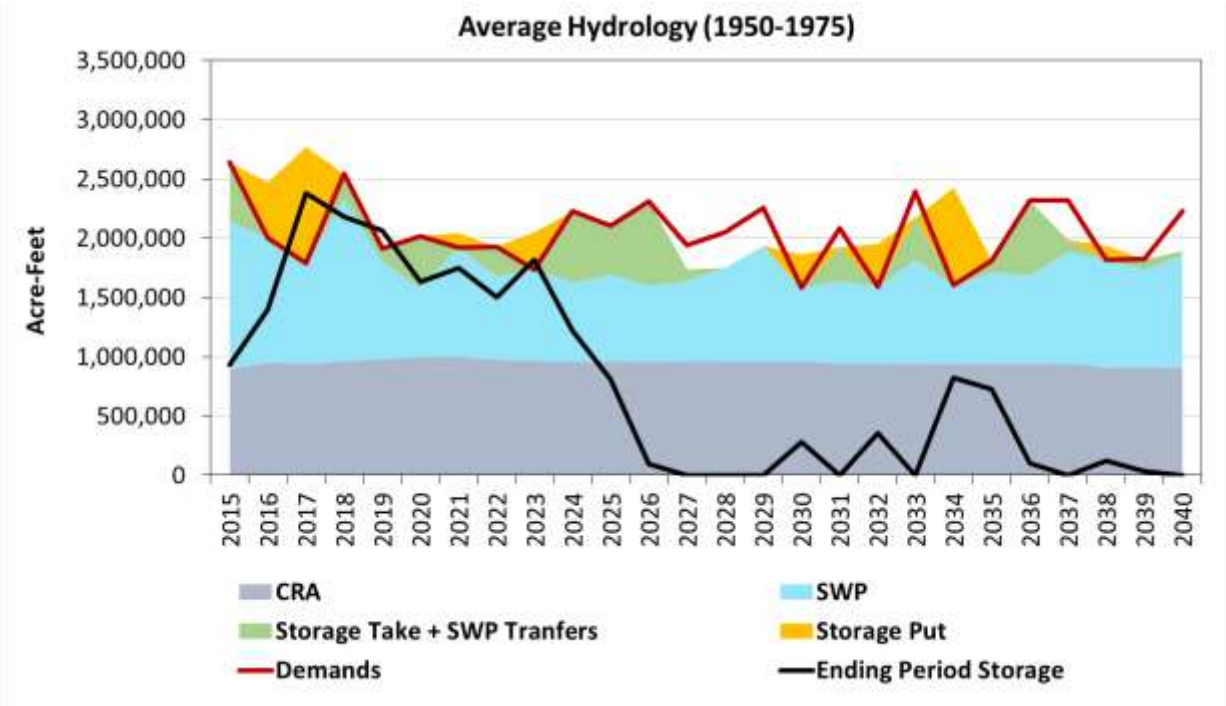


Figure 14. MET Reliability under Average Hydrology, for Scenario 1a (no Climate variability, no Cal Fix)

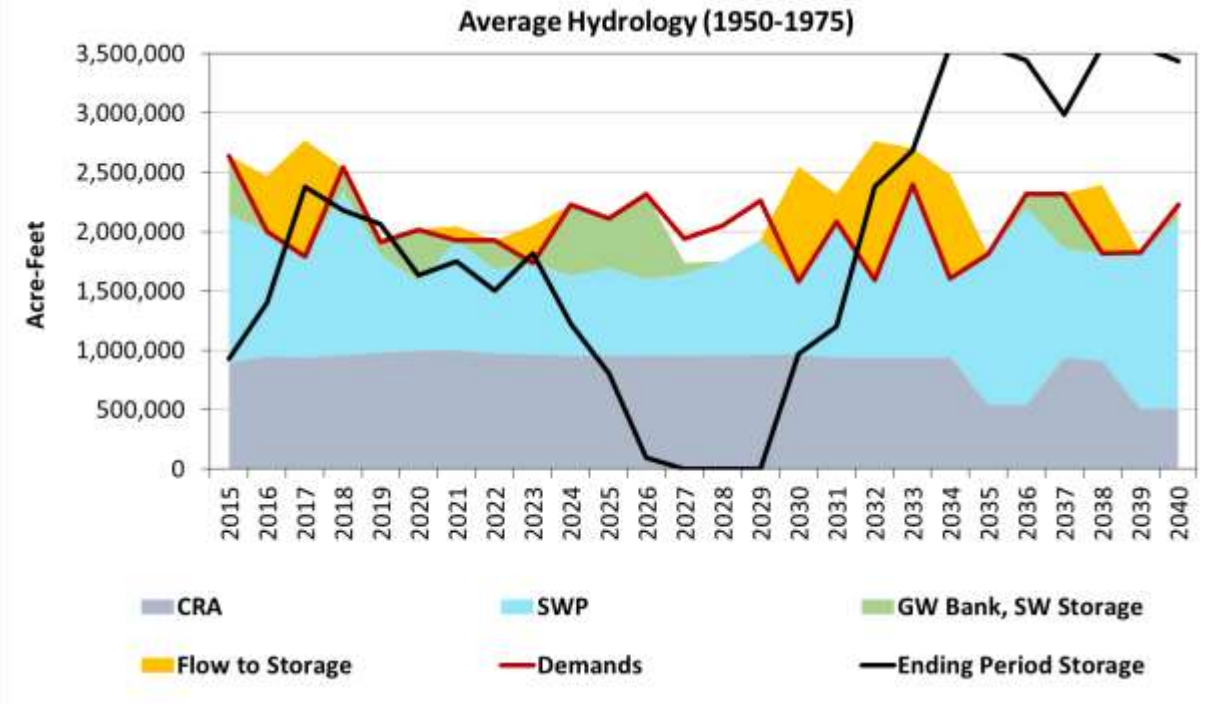


Figure 15. MET Reliability under Average Hydrology, for Scenario 1b (no Climate variability, with Cal Fix)

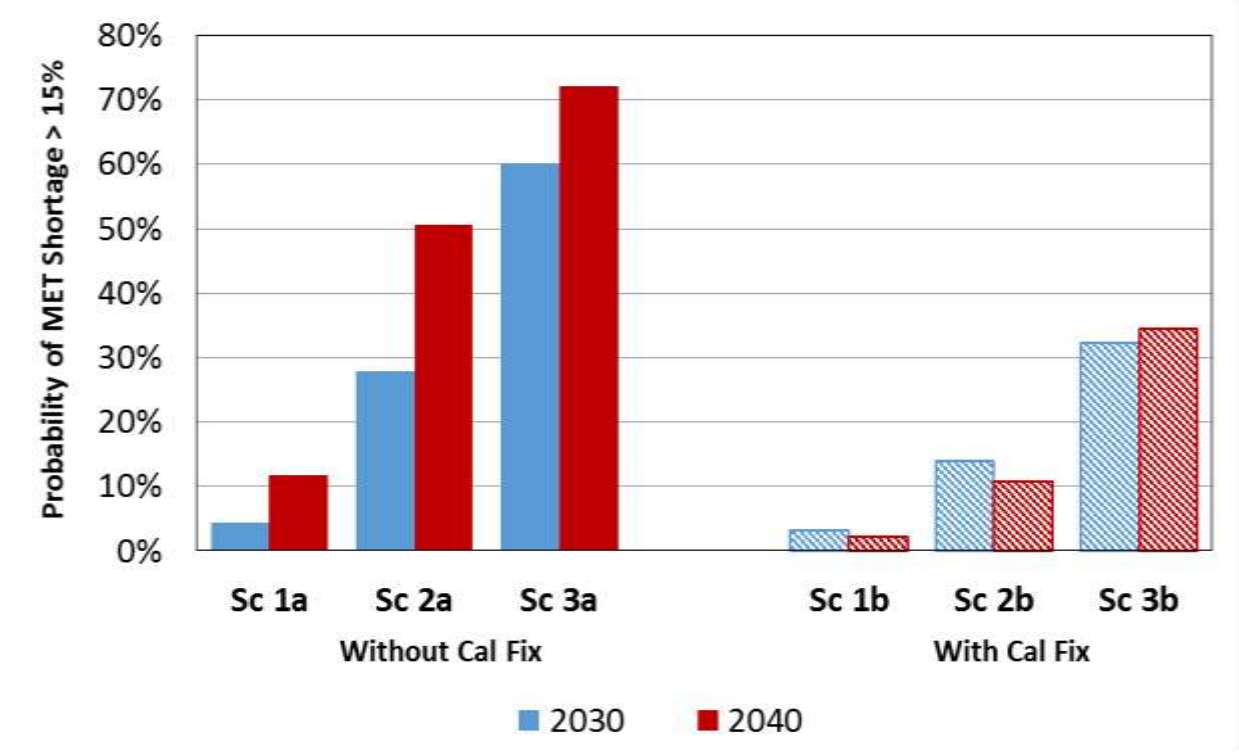


Figure 16. MET Supply Reliability (Percent of Time MET Supply Shortage Greater than 15%)

As shown in Figure 16, the impacts of climate variability (Scenarios 2 and 3) can be significant in increasing the probability and magnitude of MET shortages. In 2040, significant climate scenario (Scenario 3) can increase the probability of shortage by 60 percent without Cal Fix. The analysis also shows the enormous benefit that Cal Fix can have on MET reliability, decreasing the probability of shortage from 50 percent in 2040 to 10 percent under Scenario 2.

4.3 Orange County Water Supply Gap

When MET shortages occur, imported water is allocated to Orange County based on MET's current drought allocation formula. For the OC Basin, the estimation of the water supply gap required that the OC Model be able to simulate the way OCWD manages the OC Basin. The OC Basin's Basin Production Percentage (BPP) was set in the model to look forward each year and estimate all inflows to the basin, then set the BPP so that the cumulative overdraft in the basin would not exceed 500,000 af. In addition, the model does not allow the change in overdraft to exceed certain thresholds—essentially trying to keep some managed overdraft in the basin.

Note: Modeling the management of the OCWD basin is complex, especially with respect to future uncertainties. The discussion of this effort herein was an initial attempt to reflect on how the BPP could be set within the context of a modeling effort. Since this initial effort, CDM Smith and OCWD have met a number of times to refine the analysis for the Phase 2 effort. The refined analysis will be documented in the final Project Technical Memorandum.

Figure 17 presents a simulation of the OC Basin for the forecast period of 2015 to 2040, under an extreme drought hydrology of 1989 to 2014. Under Scenario 1, with no climate scenario and no Cal Fix, Figure 17 shows the pumping from the basin (blue line), the sources of inflows to the basin (shaded color areas), the cumulative basin overdraft (red line), and the BPP (dashed black line read on right-hand axis).

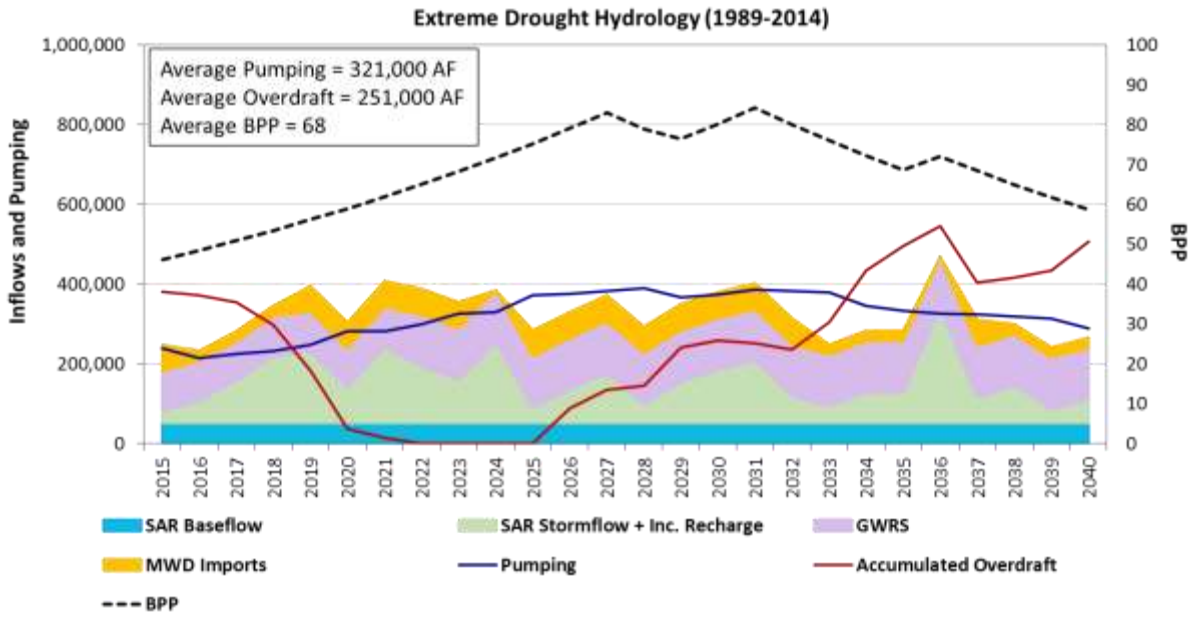


Figure 17. Simulation of OC Basin under Drought, for Scenario 1a (no Climate scenario, no Cal Fix)

When the other local Orange County water supplies from the Brea/La Habra and South County areas are added to the simulation, the OC Model estimates the overall supply reliability for the OC County total. Using all 93 hydrologic sequences, a probability chart can be created. The probability chart shows the percent time that any water shortage occurs and to what magnitude. Figure 18 shows the overall reliability for OC County total for Scenarios 1a, 2a and 3a (no Cal Fix) for the year 2040. As shown on this chart, there is a 50 percent chance that some level of shortage occurs for Scenario 1a. This probability of some shortage occurring increases to 80 percent for Scenario 2a and 98 percent for Scenario 3a. The average shortages are 32,000 afy, 74,000 afy, and 126,000 afy for Scenarios 1a, 2a, and 3a respectively.

Figure 19 compares Scenarios 1, 2, and 3 with and without the Cal Fix. As shown in Figure 19, the Cal Fix dramatically reduces the probability of shortages and thus the average shortages. The average shortages under the Cal Fix are 5,000 afy, 17,000 afy, and 64,000 afy for Scenarios 1b, 2b, and 3b respectively. The one thing to note, however, is that the maximum shortages (which occur about 1 to 3 percent of the time) are not reduced substantially with the Cal Fix. These maximum shortages may require a multipronged strategy to minimize or eliminate, such as new base-loaded supplies, storage, water transfers and mandatory restrictions on some water uses.

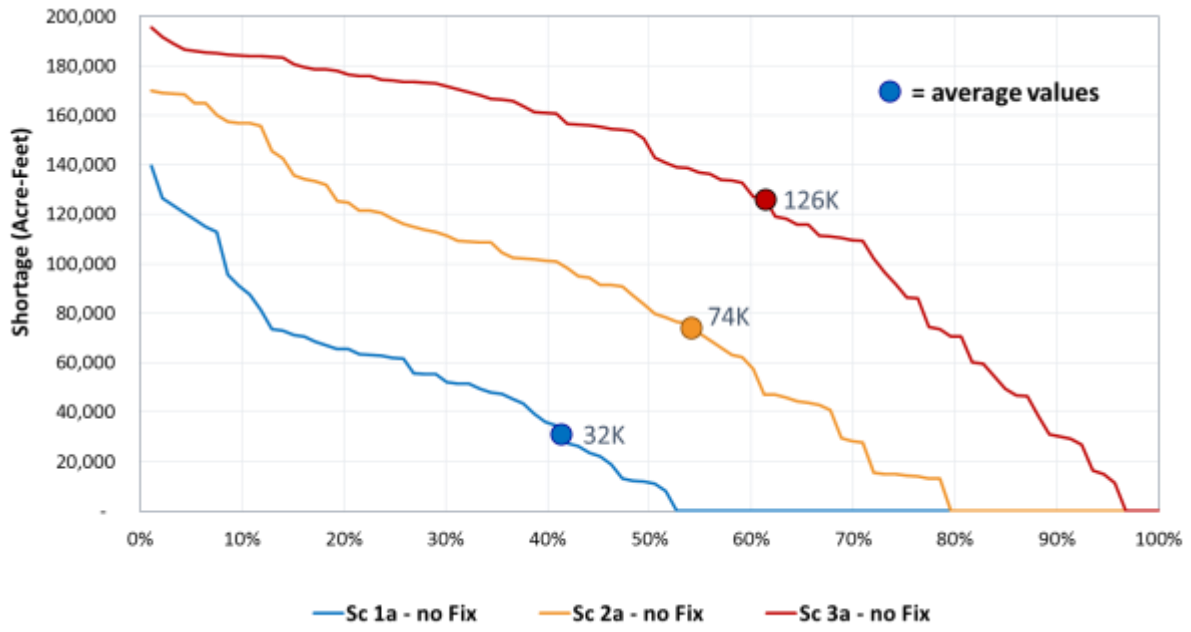


Figure 18. Probability of Water Shortages (Gap) for Orange County Total, No Cal Fix

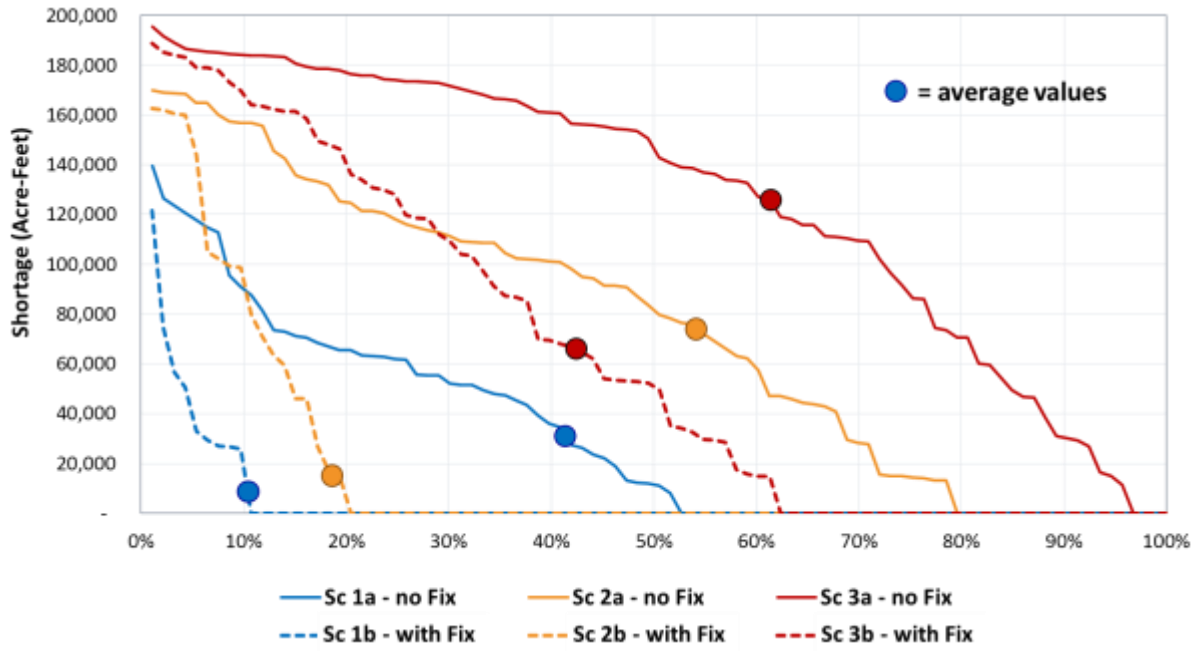


Figure 19. Probability of Water Shortages (Gap) for Orange County Total, with Cal Fix

This supply reliability analysis was done for all three areas of the Orange County, Brea/La Habra, OC Basin, and South County. The average water shortages (averaged for all 93 hydrologic sequences) are shown in Table 10 for all six scenarios.

Table 10. Summary of Average Water Supply Gap for Orange County Areas (acre-feet year)

Area	Scenario 1		Scenario 2		Scenario 3	
Brea / La Habra	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**
2020	110 (1%)	110 (1%)	160 (1%)	160 (1%)	250 (1%)	250 (1%)
2040	820 (4%)	130 (1%)	1,800 (9%)	430 (2%)	3,100 (15%)	1,600 (8%)
OC Basin	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**
2020	3,800 (1%)	3,800 (1%)	5,300 (1%)	5,300 (1%)	9,300 (2%)	9,300 (2%)
2040	19,000 (5%)	2,800 (1%)	49,000 (12%)	11,000 (3%)	85,000 (20%)	42,000 (10%)
South County	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**
2020	2,100 (2%)	2,100 (2%)	3,000 (3%)	3,000 (3%)	4,800 (4%)	4,800 (4%)
2040	12,000 (9%)	1,900 (2%)	23,000 (18%)	5,600 (4%)	38,000 (28%)	20,000 (15%)
OC Total	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**	**a – no Fix**	**b – with Fix**
2020	6,000 (1%)	6,000 (1%)	8,500 (2%)	8,500 (2%)	14,000 (3%)	14,000 (3%)
2040	32,000 (6%)	4,800 (1%)	74,000 (13%)	17,000 (3%)	126,000 (21%)	64,000 (11%)

* Numbers in parentheses ( ) represent % of water demand.

5.0 Conclusions

While no attempt was made during Phase 1 of the OC Study to assign the likelihood of any one of the six scenarios occurring over the others, some might postulate that Scenario 2 would be the most likely to occur given that most climate experts believe we are already seeing evidence of climate variability impacts today. This all said, a number of observations can be made from this study, which are:

1. The most sensitive model parameters are:
    - Whether or not the Cal Fix is implemented, and by when
    - The extent that climate variability impacts our supply reliability, which can take many forms:
        - Loss of the snowpack in the Sierras and Rocky's affecting imported water
        - Higher reservoir evapotranspiration
        - Reduced groundwater recharge statewide and locally
        - Increased water demands for irrigation and cooling from higher temperatures
        - Requires increase storage to capture and utilize available supplies

2. The range in water supply gaps carry different implications, namely:
    - Under Scenario 1a (no climate variability, no Cal Fix), supply shortages are fairly manageable, with average shortages in 2040 being about 6% of demand with an occurrence of about 4 in 10 years.
    - Under Scenario 2a (moderate climate variability, no Cal Fix), supply shortages require moderate levels of new investments, with average shortages in 2040 being about 13% of demands with an occurrence of about 5 in 10 years.
    - Under Scenario 3a (significant climate variability, no Cal Fix), supply shortages require significant levels of new investments, with average shortages in 2040 being about 21% of demands with an occurrence of about 6 in 10 years.
    - Scenarios with Cal Fix significantly reduce average shortages by 85% for Scenario 1, by 77% for Scenario 2, and by 50% for Scenario 3 in 2040.
    - Modest shortages begin in 2020, 8,500 AF per year on average (about 2% of demands) with an occurrence of about 1 in 10 years
3. Decisions made by Orange County water agencies to improve water supply reliability with local water supply investments should consider the following:
    - The large influence of the Cal Fix. MET and Orange County are much more reliable with the Cal Fix; however, the following questions are posed:
        - What is the implication for triggering Orange County supply investments as long as the Cal Fix is an uncertainty?
        - How long should Orange County wait to see where the Cal Fix is headed? 3, 5 or 10 years?
        - What types of Orange County supply investment decisions would be beneficial whether or not the Cal Fix proceeds ahead?
    - MET is potentially undertaking a NEW Indirect Potable Reuse project.
        - What are the implications of this project for decision-making in Orange County?
    - Other MET investments in its recommended 2015 IRP.
        - What success rate does Orange County attribute to these planned MET water supply investments?
        - Will the success rate be influenced by the Cal Fix? (e.g., additional storage without Cal Fix may not provide much benefit if there is no replenishment water during normal hydrologic years)

Phase 2 of the OC Study seeks to address these observations in a collaborative way by providing insights as to the various cost implications of different portfolios made up from MET, the MET member agencies and Orange County water supply options and to discuss policy implications for MET and Orange County. The combined information from Phases 1 and 2 would give local decision

makers both an idea of the risk of water supply shortages under a wide range of plausible scenarios, and the range of cost implications for mitigating the shortages. The intent of the OC Study, however, is to not to make any specific recommendations as to which supply options should be implemented, but rather present common information in an objective manner for local decision making.

6.0 References

Center for Demographic Research (2015). Demographic forecasts for Orange County water agencies provided to MWDOC.

Metropolitan Water District of Southern California (2005). The Regional Urban Water Management Plan.

Metropolitan Water District of Southern California (2013). Inland Feeder … at a glance.

Metropolitan Water District of Southern California (2015). http://www.mwdh2o.com/mwdh2o/pages/operations/ops01.html

Metropolitan Water District of Southern California (2015). Draft Integrated Resources Plan.

Municipal Water District of Orange County (2011). 2010 Urban Water Management Plan.

Municipal Water District of Orange County (2015). Existing and Planned Recycled Water Supply/Use in Orange County. From: Robert Hunter, To: Planning & Operations Committee, June 1 2015.

Municipal Water District of Orange County (2015). Historical SoCalWater$mart conservation savings for Orange County. Data provided to CDM Smith.

Orange County Water District. (2007). 2005-2006 Engineer's Report on the groundwater conditions, water supply and basin utilization in the Orange County Water District. Orange County Water District Board of Directors, February 2007.

Orange County Water District (2013). 2011-2012 Report on Groundwater Recharge in the Orange County Groundwater Basin.

Orange County Water District (2014). Long-Term Facilities Plan 2014 Update.

Orange County Water District (2015). Draft OCWD Water Management Plan 2015.

United States Bureau of Reclamation (2007). Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead: Appendix D, Lower Division States Depletion Schedules. D-3. http://www.usbr.gov/lc/region/programs/strategies/FEIS/index.html

United States Bureau of Reclamation (2011). Operation Plan for Colorado River System Reservoirs (24-Month Study). http://www.usbr.gov/lc/region/g4000/24mo/index.html

United States Bureau of Reclamation (2012). Colorado River Basin Water Supply and Demand Study: Appendix G, Analysis & Evaluation. G2-5 to G2-6.
http://www.usbr.gov/lc/region/programs/crbstudy/finalreport/index.html

United States Bureau of Reclamation (2013). Hood River Basin Study: Groundwater Modeling. Presentation, August 19th 2013.

South Coast Water District (2015). Draft Water Supply Allocation Plan, February 12, 2015.

California Department of Water Resources, State Water Project (2015). Draft Delivery Capability Report.

Yates, D., Averyt, K., Flores-Lopez, F., Meldrum, J., Sattler, S., Sieber, J., and Young, C. (2013). A water resources model to explore the implications of energy alternatives in the southwestern US. Environ. Res. Lett., 8, 14 pp.

APPENDIX G

AWWA Water Loss Audit Worksheet

AWWA Free Water Audit Software v5.0

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:	Booby Young
Email Address:	byoung@etwd.com
Telephone (incl Ext.):	949-837-705 ext. 247
Name of City / Utility:	El Toro Water District
City/Town/Municipality:	Lake Forest
State / Province:	California (CA)
Country:	USA
Year:	2015 Calendar Year
Audit Preparation Date:	4/20/2016
Volume Reporting Units:	Acre-feet
PWSID / Other ID:	

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- 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

? Click to access definition
+ Click to add a comment

Water Audit Report for: El Toro Water District
Reporting Year: 2015 (1/2015 - 12/2015)

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

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

				Pcnt:	Value:	
Volume from own sources:			acre-ft/yr			acre-ft/yr
Water imported:	7	7,631.446	acre-ft/yr	7		acre-ft/yr
Water exported:			acre-ft/yr			acre-ft/yr
WATER SUPPLIED:		**7,631.446**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	7,243.603	acre-ft/yr			
Billed unmetered:	n/a		acre-ft/yr			
Unbilled metered:	8	7.568	acre-ft/yr			
Unbilled unmetered:	6	4.500	acre-ft/yr		4.500	acre-ft/yr
AUTHORIZED CONSUMPTION:		**7,255.671**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption) **375.775** acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		19.079	acre-ft/yr	0.25%		acre-ft/yr
Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed						
Customer metering inaccuracies:	1	36.438	acre-ft/yr	0.50%		acre-ft/yr
Systematic data handling errors:	5	18.109	acre-ft/yr	0.25%		acre-ft/yr
Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed						
Apparent Losses:		**73.626**	acre-ft/yr			

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:		**302.149**	acre-ft/yr
WATER LOSSES:		**375.775**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **387.843** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	180.6	miles
Number of active AND inactive service connections:	7	10,033	
Service connection density:		56	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			(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:	8	87.0	psi

COST DATA

Total annual cost of operating water system:	9	$14,579,645	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$3.16	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	10	$942.00	$/acre-ft	☐Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 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: Water imported
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

Water Audit Report for: El Toro Water District
Reporting Year: 2015 | 1/2015 - 12/2015

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 67 out of 100 ***

System Attributes:

	Apparent Losses:	73.626	acre-ft/yr
+	Real Losses:	302.149	acre-ft/yr
=	**Water Losses:**	**375.775**	acre-ft/yr
?	Unavoidable Annual Real Losses (UARL):	241.89	acre-ft/yr
	Annual cost of Apparent Losses:	$101,404	
	Annual cost of Real Losses:	$284,624	Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumpiton

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:	2.7%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.55	gallons/connection/day
	Real Losses per service connection per day:	26.89	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.31	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	302.15	acre-feet/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	1.25	

* 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

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:	
Unbilled unmetered:	
Unauthorized consumption:	

Audit Item	Comment
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

American Water Works Association.

Water Audit Report for:	El Toro Water District	
Reporting Year:	2015	1/2015 - 12/2015
Data Validity Score:	67	

	Water Exported *0.000*	Billed Water Exported			
Own Sources (Adjusted for known errors) *0.000*	Water Supplied *7,631.446*	Authorized Consumption *7,255.671*	Billed Authorized Consumption *7,243.603*	Billed Metered Consumption (water exported is removed) *7,243.603*	Revenue Water 7,243.603
				Billed Unmetered Consumption *0.000*	
			Unbilled Authorized Consumption *12.068*	Unbilled Metered Consumption *7.568*	Non-Revenue Water (NRW) 387.843
				Unbilled Unmetered Consumption *4.500*	
		Water Losses *375.775*	Apparent Losses *73.626*	Unauthorized Consumption *19.079*	
				Customer Metering Inaccuracies *36.438*	
				Systematic Data Handling Errors *18.109*	
Water Imported *7,631.446*			Real Losses *302.149*	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*	

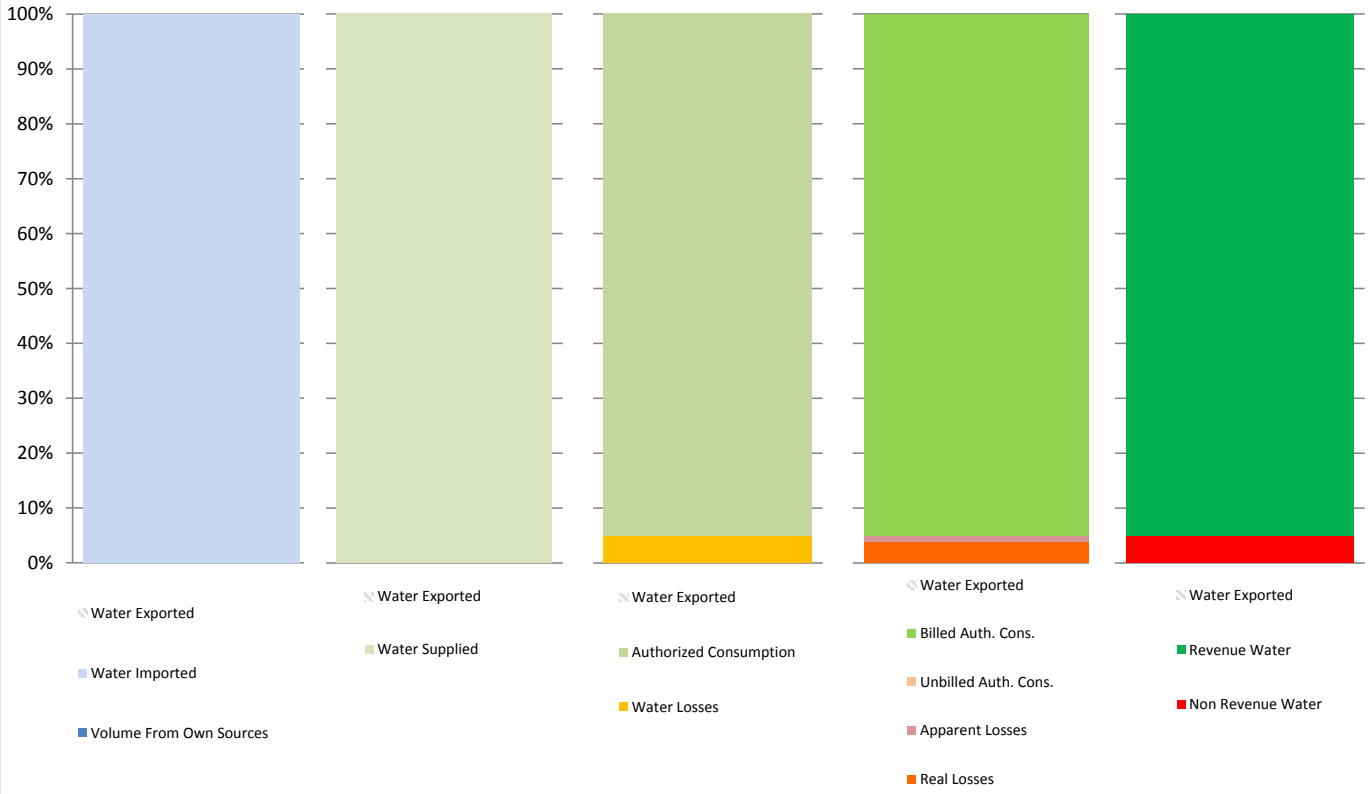
AWWA Free Water Audit Software:
Dashboard

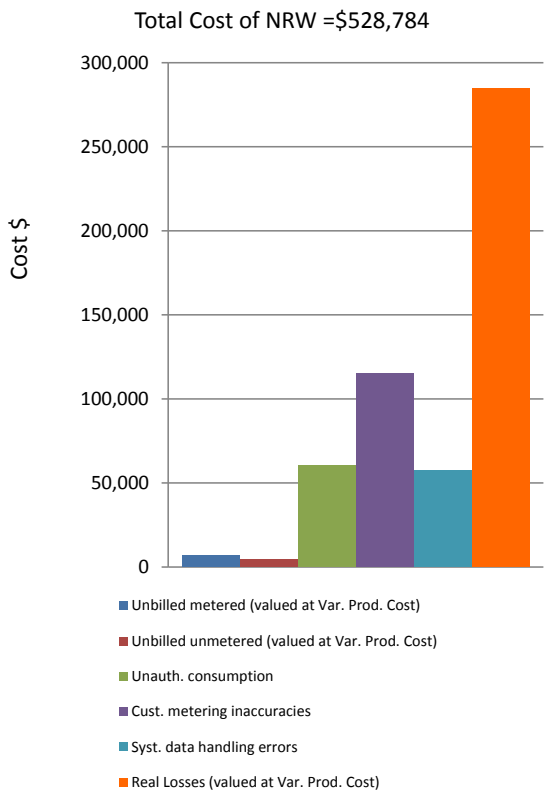
WAS v5.0
American Water Works Association.

The graphic below is a visual representation of the Water Balance with bar heights propotional to the volume of the audit components

Water Audit Report for: El Toro Water District
Reporting Year: 2015 (1/2015 - 12/2015)
Data Validity Score: 67

○ Show me the VOLUME of Non-Revenue Water
◉ Show me the COST of Non-Revenue Water





APPENDIX H

Water Use Efficiency Implementation Report

Orange County

Water Use Efficiency Programs Savings
and
Implementation Report

Retrofits and Acre-Feet Water Savings for Program Activity

Program	Program Start Date	Retrofits Installed in	Month Indicated		Current Fiscal Year		Overall Program		
			Interventions	Water Savings	Interventions	Water Savings	Interventions	Annual Water Savings[4]	Cumulative Water Savings[4]
High Efficiency Clothes Washer Program	2001	October-15	532	1.53	2,244	16.15	105,611	3,644	20,708
Smart Timer Program - Irrigation Timers	2004	October-15	1	0.00	371	15.65	13,438	4,655	28,933
Rotating Nozzles Rebate Program	2007	October-15	3,709	14.83	18,064	135.73	478,934	2,422	9,721
SoCal Water$mart Commercial Plumbing Fixture Rebate Program	2002	September-15	2,767	7.65	3,622	18.06	51,788	3,518	34,157
Water Smart Landscape Program [1]	1997	September-15	12,690	905.55	12,690	2,710.58	12,690	10,632	71,574
Industrial Process Water Use Reduction Program	2006	September-15	0	11.26	1	11.26	14	357	1,357
Turf Removal Program[3]	2010	November-15	947,615	11.05	2,868,923	68	10,386,596	1,454	2,982
High Efficiency Toilet (HET) Program	2005	October-15	2,337	8.28	8,102	114.87	54,376	2,010	11,439
Home Water Certification Program	2013	October-15	11	0.022	42	0.147	301	7.080	15.007
Synthetic Turf Rebate Program	2007						685,438	96	469
Ultra-Low-Flush-Toilet Programs [2]	1992						363,926	13,452	162,561
Home Water Surveys [2]	1995						11,867	160	1,708
Showerhead Replacements [2]	1991						270,604	1,667	19,083
Total Water Savings All Programs				**960**	**2,914,059**	**3,090**	**12,435,583**	**44,073**	**364,706**

(1) Water Smart Landscape Program participation is based on the number of water meters receiving monthly Irrigation Performance Reports.

(2) Cumulative Water Savings Program To Date totals are from a previous Water Use Efficiency Program Effort.

(3) Turf Removal Interventions are listed as square feet.

[4] Cumulative & annual water savings represents both active program savings and passive savings that continues to be realized due to plumbing code changes over time.

HIGH EFFICIENCY CLOTHES WASHERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY13/14	FY14/15	FY15/16	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years	15 yr. Lifecycle Savings Ac/Ft
Brea	132	175	156	42	186	144	93	115	114	43	1,777	0.30	346.91	919
Buena Park	85	114	146	59	230	145	105	106	91	24	1,412	0.19	263.13	731
East Orange CWD RZ	18	22	17	3	23	10	10	8	8	4	185	0.03	38.21	96
El Toro WD	91	113	130	32	162	112	134	121	111	29	1,438	0.23	267.47	744
Fountain Valley	205	219	243	72	289	158	115	102	110	37	2,296	0.24	467.55	1,188
Garden Grove	238	304	332	101	481	236	190	162	165	42	3,227	0.36	641.93	1,670
Golden State WC	339	401	447	168	583	485	265	283	359	106	4,723	0.80	909.33	2,444
Huntington Beach	761	750	751	211	963	582	334	295	319	89	7,930	0.64	1,649.30	4,103
Irvine Ranch WD	1,972	2,052	1,844	1,394	2,621	2,170	1,763	1,664	1,882	676	22,448	4.63	4,161.08	11,615
La Habra	96	136	83	22	179	128	82	114	87	25	1,233	0.16	230.28	638
La Palma	33	35	51	25	76	46	34	25	34	10	429	0.07	78.92	222
Laguna Beach CWD	57	77	77	27	96	57	38	37	39	23	904	0.16	181.03	468
Mesa Water	239	249	246	73	232	176	114	86	89	27	2,352	0.21	498.68	1,217
Moulton Niguel WD	652	716	742	250	1,127	679	442	421	790	337	8,995	2.42	1,691.75	4,654
Newport Beach	245	270	259	57	197	142	116	92	95	36	2,533	0.28	540.91	1,311
Orange	366	365	403	111	349	262	218	163	160	54	3,748	0.44	781.73	1,939
Orange Park Acres	4	8	-	-	-	-	-	-	-	-	12	0.00	3.09	6
San Juan Capistrano	109	103	127	43	190	110	76	73	92	34	1,397	0.30	271.08	723
San Clemente	204	261	278	63	333	206	140	94	141	41	2,516	0.29	494.64	1,302
Santa Margarita WD	654	683	740	257	1,105	679	553	662	792	224	8,907	1.68	1,660.81	4,609
Seal Beach	47	46	57	7	81	51	31	29	38	12	582	0.10	113.15	301
Serrano WD	30	31	23	7	21	20	13	10	26	5	343	0.03	71.90	177
South Coast WD	107	130	148	43	183	112	89	79	68	25	1,522	0.18	297.39	788
Trabuco Canyon WD	69	60	62	28	82	62	30	45	47	19	755	0.14	146.53	391
Tustin	152	146	144	45	174	97	78	59	80	32	1,534	0.23	314.38	794
Westminster	213	171	233	74	329	208	121	82	109	30	2,383	0.20	480.73	1,233
Yorba Linda	288	350	367	117	394	273	181	167	156	64	3,637	0.47	750.09	1,882
MWDOC Totals	7,406	7,987	8,106	3,331	10,686	7,350	5,365	5,094	6,002	2,048	89,218	14.78	17,352.00	17,237
Anaheim	854	847	781	860	910	477	331	285	295	98	10,301	0.68	2,141.25	5,330
Fullerton	269	334	330	69	397	270	200	186	211	63	3,486	0.45	644.49	1,804
Santa Ana	236	235	257	87	355	190	163	131	132	35	2,606	0.25	570.33	1,348
Non-MWDOC Totals	1,359	1,416	1,368	1,016	1,662	937	694	602	638	196	16,393	1.37	3,356.08	3,167
Orange County Totals	8,765	9,403	9,474	4,347	12,348	8,287	6,059	5,696	6,640	2,244	105,611	16.15	20,708.07	20,404

SMART TIMERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation ProgramS

	FY 04/05		FY 05/06		FY 06/07		FY 07/08		FY 08/09		FY 09/10		FY 10/11		FY 11/12		FY 12/13		FY 13/14		FY 14/15		FY 15/16		Total Program		Cumulative Water Savings across all Fiscal Years
Agency	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm.	
Brea	2	0	1	3	8	6	0	40	3	9	0	0	2	0	8	0	9	8	4	0	43	6	5	0	85	72	398.22
Buena Park	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	19	3	0	0	0	4	10	0	0	14	30	85.75
East Orange CWD RZ	1	0	2	0	0	0	0	0	0	0	0	0	1	0	5	0	2	0	0	0	2	0	0	0	13	0	3.55
El Toro WD	1	0	8	0	4	95	1	174	0	25	2	18	5	5	26	2	7	2	11	0	8	9	4	0	77	330	1,976.03
Fountain Valley	3	3	2	2	11	0	4	0	1	0	0	6	2	2	8	2	3	2	4	0	7	10	2	0	47	27	114.99
Garden Grove	2	2	11	1	2	0	1	3	2	1	6	0	5	4	7	0	5	2	9	0	10	14	3	3	63	30	106.46
Golden State WC	0	0	15	2	24	12	8	8	1	2	9	22	7	4	13	3	9	49	9	25	39	12	1	0	135	139	520.07
Huntington Beach	5	2	21	9	12	12	7	1	13	1	6	27	6	36	15	4	18	33	20	35	19	2	11	0	153	162	665.38
Irvine Ranch WD	2	2	68	111	160	434	66	183	29	56	14	145	28	153	267	71	414	135	71	59	67	310	9	0	1,195	1,659	7,923.73
La Habra	0	0	0	0	7	1	1	0	0	0	0	21	0	0	3	0	4	7	2	0	4	7	57	43	78	79	171.24
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	0	1	1	7	1	1.60
Laguna Beach CWD	3	0	5	0	21	0	5	0	2	0	2	14	4	1	109	2	76	2	71	0	86	0	0	0	384	19	157.52
Mesa Water	5	0	13	27	14	6	12	0	6	7	13	7	7	22	21	0	10	2	15	2	17	28	5	0	138	101	486.67
Moulton Niguel WD	2	0	25	10	39	52	59	20	21	23	17	162	36	60	179	31	51	74	40	45	46	95	2	0	517	572	2,337.11
Newport Beach	3	17	35	4	125	86	98	40	10	27	7	58	6	0	275	12	242	26	168	75	11	9	53	25	1,033	379	1,957.82
Orange	8	4	37	13	28	38	4	0	5	2	2	13	5	8	25	0	20	24	13	9	18	31	4	0	169	142	667.97
San Juan Capistrano	0	0	5	4	5	4	11	1	10	0	7	49	13	1	103	2	14	18	6	11	6	19	4	2	184	111	448.73
San Clemente	4	0	483	1	46	7	21	60	81	20	13	209	46	11	212	17	26	7	28	2	28	24	16	6	1,004	364	2,056.38
Santa Margarita WD	3	0	15	8	40	96	53	70	25	44	10	152	61	53	262	7	53	171	64	93	53	321	8	0	647	1,015	3,563.97
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	1	31	1	2.10
Seal Beach	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	1	0	1	36	1	12	0	0	3	52	104.07
Serrano WD	0	0	0	0	0	0	0	0	0	0	11	0	4	0	3	0	1	0	0	0	4	0	1	0	24	0	5.95
South Coast WD	2	0	6	1	17	29	7	49	11	6	3	10	13	3	78	10	13	16	8	4	104	73	4	0	266	201	828.89
Trabuco Canyon WD	0	0	29	0	10	93	4	0	1	0	2	0	2	10	12	0	6	0	2	0	6	1	6	0	80	104	695.27
Tustin	1	0	1	4	0	0	2	3	7	9	10	14	10	0	11	0	8	4	9	1	18	14	8	0	85	49	211.62
Westminster	1	0	8	12	6	0	1	0	3	0	3	0	1	1	2	0	1	1	2	0	13	17	4	0	45	31	130.93
Yorba Linda	0	0	30	6	31	5	20	41	8	5	5	21	25	0	22	0	20	0	12	5	32	2	15	1	220	86	529.19
MWDOC Totals	48	30	820	218	610	976	385	693	242	238	142	949	289	374	1,671	185	1,017	583	571	402	648	1,026	254	82	6,697	5,756	26,151.20
Anaheim	6	1	8	13	17	78	12	57	9	59	5	46	12	11	23	60	19	10	9	26	7	52	6	7	133	420	1,949.05
Fullerton	0	0	2	0	10	0	10	0	2	2	2	39	9	33	22	51	9	29	8	0	40	26	5	6	119	186	641.99
Santa Ana	0	0	0	0	1	0	3	0	2	4	1	8	8	0	6	5	8	19	7	8	9	27	10	1	55	72	190.50
Non-MWDOC Totals	6	1	10	13	28	78	25	57	13	65	8	93	29	44	51	116	36	58	24	34	56	105	21	14	307	678	2,781.54
Orange County Totals	54	31	830	231	638	1,054	410	750	255	303	150	1,042	318	418	1,722	301	1,053	641	595	436	704	1,131	275	96	7,004	6,434	28,933

ROTATING NOZZLES INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

	FY 06/07			FY 07/08			FY 08/09			FY 10/11			FY 11/12			FY 12/13			FY 13/14			FY 14/15			FY 15/16			Total Program			Cumulative Water Savings across all Fiscal Years
	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	
Agency	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	
Brea	0	0	0	0	0	0	22	0	0	32	0	0	130	0	0	65	120	0	84	0	0	157	45	0	0	842	0	498	1,107	0	13.71
Buena Park	0	0	0	0	0	0	37	75	0	29	0	0	32	0	0	65	0	0	53	0	0	248	0	0	0	0	0	464	75	2,535	450.81
East Orange	0	0	0	0	0	0	105	0	0	0	0	0	340	0	0	55	0	0	30	0	0	221	0	0	0	0	0	751	0	0	9.60
El Toro	0	0	0	0	0	0	88	290	0	174	0	0	357	76	0	23	6,281	0	56	3,288	0	1,741	28,714	0	90	4,457	0	2,674	45,980	890	635.80
Fountain Valley	0	0	0	51	0	0	83	0	0	83	0	0	108	0	0	35	0	0	0	0	0	107	0	0	18	0	0	506	0	0	7.95
Garden Grove	0	0	0	44	0	0	153	106	0	38	0	0	119	0	0	95	0	0	80	0	0	88	50	0	44	0	0	812	201	0	17.16
Golden State	0	0	0	161	0	0	83	0	0	303	943	0	294	0	0	257	2,595	0	192	0	0	583	1,741	0	65	0	0	2,218	5,308	0	102.89
Huntington Beach	0	0	0	93	845	1,202	322	19	1,174	203	625	0	458	0	0	270	0	0	120	0	0	798	1,419	0	198	1,432	0	2,501	7,760	2,681	746.72
Irvine Ranch	0	0	0	610	7,435	440	1,594	5,108	85	2,411	2,861	0	1,715	4,255	0	25,018	1,014	0	11,010	4,257	0	1,421	632	0	171	1,110	0	44,984	81,113	2,004	2,656.37
La Habra	0	535	0	9	0	0	15	0	900	0	0	0	33	90	0	0	0	0	15	0	0	109	338	0	21	0	0	202	1,236	900	217.49
La Palma	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0.24
Laguna Beach	0	0	0	115	0	0	101	47	0	156	0	0	763	0	0	3,596	0	0	2,948	878	0	2,879	1,971	0	46	0	0	10,795	2,896	0	164.61
Mesa Water	83	0	0	0	25	343	198	0	0	118	0	0	297	277	0	270	0	0	361	0	0	229	0	0	77	0	0	1,828	385	343	117.26
Moulton Niguel	0	0	0	297	120	0	426	6,883	1,986	1,578	0	0	1,225	0	0	512	1,385	0	361	227	0	1,596	4,587	0	473	233	0	6,702	13,435	2,945	906.15
Newport Beach	0	0	0	22	569	0	65	170	0	337	1,208	0	640	3,273	0	25,365	50	0	19,349	6,835	0	460	3,857	0	250	0	0	46,580	20,743	0	947.31
Orange	0	0	0	158	0	0	961	163	0	135	30	0	343	0	0	264	0	0	245	120	0	304	668	0	271	0	0	2,810	981	0	58.18
San Clemente	0	0	0	118	0	0	466	25	0	2,612	851	0	4,266	117	1,343	631	172	0	415	5,074	0	326	0	0	279	0	0	9,842	7,538	1,343	387.00
San Juan Capistrano	0	0	0	70	0	0	434	1,660	0	1,452	0	0	949	0	0	684	30	0	370	0	0	495	737	0	15	0	0	5,125	8,136	0	239.81
Santa Margarita	0	0	0	165	0	0	1,079	68	0	3,959	3,566	0	4,817	0	0	983	0	0	389	0	0	1,207	1,513	0	711	107	0	15,041	6,191	611	415.93
Seal Beach	0	0	0	0	0	0	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	5,261	0	0	0	0	155	5,552	0	50.97
Serrano	0	0	0	94	0	0	24	0	0	364	0	0	58	0	0	190	0	0	105	0	0	377	0	0	291	0	0	3,001	0	0	48.15
South Coast	0	0	0	74	133	0	115	0	0	318	1,772	0	688	359	0	435	0	0	70	0	0	4,993	13,717	0	116	179	0	6,809	16,160	0	213.13
Trabuco Canyon	0	0	0	130	0	0	0	0	0	0	0	0	379	0	0	34	0	0	0	0	0	56	0	0	77	0	0	2,033	791	0	52.43
Tustin	0	0	0	23	0	0	549	0	0	512	0	0	476	1,013	0	378	0	0	329	0	0	408	0	0	120	45	0	3,109	1,058	0	60.05
Westminster	0	0	0	0	0	0	111	0	0	0	0	0	26	0	0	15	0	0	0	0	0	54	0	0	57	0	0	343	0	0	5.47
Yorba Linda	0	0	0	563	0	0	440	113	500	529	0	0	559	0	0	730	0	0	40	990	0	921	0	0	636	0	0	4,789	4,359	500	255.63
MWDOC Totals	83	535	0	2,797	9,127	1,985	7,596	14,727	4,645	15,343	11,856	0	19,072	9,460	1,343	59,970	11,647	0	36,622	21,669	0	19,818	65,250	0	4,026	8,405	0	174,582	231,005	14,752	8,780.80
Anaheim	0	0	0	68	0	0	329	0	0	372	382	0	742	38,554	0	459	813	0	338	0	0	498	712	0	152	5,221	0	3,231	45,846	105	575.88
Fullerton	0	0	0	95	0	0	446	64	0	416	0	0	409	0	0	119	0	0	107	0	0	684	1,196	0	260	0	0	2,584	1,260	1,484	306.37
Santa Ana	0	0	0	145	0	0	96	56	0	53	0	0	22	65	0	99	0	0	86	2,533	0	310	0	0	0	0	0	859	3,226	0	57.47
Non-MWDOC Totals	0	0	0	308	0	0	871	120	0	841	382	0	1,173	38,619	0	677	813	0	531	2,533	0	1,492	1,908	0	412	5,221	0	6,674	50,332	1,589	939.71
Orange County Totals	83	535	0	3,105	9,127	1,985	8,467	14,847	4,645	16,184	12,238	0	20,245	48,079	1,343	60,647	12,460	0	37,153	24,202	0	21,310	67,158	0	4,438	13,626	0	181,256	281,337	16,341	9,720.51

SOCAL WATER$MART COMMERCIAL PLUMBING FIXTURES REBATE PROGRAM[1]
INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	Totals	Cumulative Water Savings across all Fiscal Years
Brea	27	113	24	4	1	234	0	10	53	**593**	**346**
Buena Park	153	432	122	379	290	5	23	56	94	**1,859**	**908**
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	**0**	**0**
El Toro WD	0	92	143	1	137	0	212	6	1	**760**	**512**
Fountain Valley	17	35	0	2	314	0	0	1	0	**623**	**517**
Garden Grove	5	298	130	22	0	4	1	167	160	**1,525**	**1,304**
Golden State WC	46	414	55	68	135	0	1	0	182	**1,986**	**1,685**
Huntington Beach	48	104	126	96	156	104	144	7	451	**1,981**	**1,368**
Irvine Ranch WD	121	789	2,708	1,002	646	1,090	451	725	894	**11,702**	**5,898**
La Habra	191	75	53	4	0	0	0	0	109	**652**	**478**
La Palma	0	140	21	0	0	0	0	0	0	**166**	**74**
Laguna Beach CWD	20	137	189	0	0	0	27	0	0	**446**	**281**
Mesa Water	141	543	219	669	41	6	0	79	269	**3,080**	**1,817**
Moulton Niguel WD	9	69	151	6	0	0	0	3	0	**583**	**722**
Newport Beach	98	27	245	425	35	0	0	566	0	**1,834**	**1,144**
Orange	18	374	67	1	73	1	271	81	62	**1,966**	**1,560**
San Juan Capistrano	2	1	1	0	0	0	14	0	0	**260**	**367**
San Clemente	2	18	43	0	19	0	0	1	0	**432**	**350**
Santa Margarita WD	6	23	11	0	0	0	0	2	0	**117**	**182**
Santiago CWD	0	0	0	0	0	0	0	0	0	**0**	**0**
Seal Beach	1	2	124	0	0	0	0	0	0	**354**	**383**
Serrano WD	0	0	0	0	0	0	0	0	0	**0**	**0**
South Coast WD	9	114	56	422	84	148	0	382	0	**1,320**	**441**
Trabuco Canyon WD	0	4	0	0	0	0	0	0	0	**11**	**14**
Tustin	115	145	25	230	0	0	0	75	0	**832**	**720**
Westminster	40	161	16	63	35	1	28	0	20	**835**	**899**
Yorba Linda	10	24	8	30	0	1	0	0	135	**420**	**498**
MWDOC Totals	**1,079**	**4,134**	**4,537**	**3,424**	**1,966**	**1,594**	**1,172**	**2,161**	**2,430**	**34,337**	**22,466**
Anaheim	766	3,298	582	64	48	165	342	463	959	**11,331**	**6,099**
Fullerton	133	579	29	4	0	94	0	178	55	**1,736**	**1,427**
Santa Ana	493	815	728	39	12	16	17	5	178	**4,384**	**4,166**
Non-MWDOC Totals	**1,392**	**4,692**	**1,339**	**107**	**60**	**275**	**359**	**646**	**1,192**	**17,451**	**11,691**
Orange County Totals	**2,471**	**8,826**	**5,876**	**3,531**	**2,026**	**1,869**	**1,531**	**2,807**	**3,622**	**51,788**	**34,157**

[1] Retrofit devices include ULF Toilets and Urinals, High Efficiency Toilets and Urinals, Multi-Family and Multi-Family 4-Liter HETs, Zero Water Urinals, High Efficiency Clothes Washers, Cooling Tower Conductivity Controllers, Ph Cooling Tower Conductivity Controllers, Flush Valve Retrofit Kits, Pre-rinse Spray heads, Hospital X-Ray Processor Recirculating Systems, Steam Sterilizers, Food Steamers, Water Pressurized Brooms, Laminar Flow Restrictors, and Ice Making Machines.

Water Smart Landscape Program

Total Number of Meters in Program by Agency

Agency	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	Overall Water Savings To Date (AF)
Brea	0	0	0	0	0	0	0	22	22	22	22	22	62.80
Buena Park	0	0	0	0	0	17	103	101	101	101	101	101	455.49
East Orange CWD RZ	0	0	0	0	0	0	0	0	0	0	0	0	0.00
El Toro WD	88	109	227	352	384	371	820	810	812	812	812	812	4,798.99
Fountain Valley	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Garden Grove	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Golden State WC	0	0	0	14	34	32	34	32	32	32	32	32	198.31
Huntington Beach	0	0	0	0	0	31	33	31	31	31	31	31	146.22
Irvine Ranch WD	277	638	646	708	1,008	6,297	6,347	6,368	6,795	6,797	6,769	6,780	37,821.08
Laguna Beach CWD	0	0	0	0	57	141	143	141	124	124	124	124	724.23
La Habra	0	0	0	0	23	22	24	22	22	22	22	22	135.15
La Palma	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Mesa Water	191	170	138	165	286	285	288	450	504	511	514	515	2,906.82
Moulton Niguel WD	80	57	113	180	473	571	595	643	640	675	673	695	4,073.55
Newport Beach	32	27	23	58	142	171	191	226	262	300	300	300	1,479.78
Orange	0	0	0	0	0	0	0	0	0	0	0	0	0.00
San Clemente	191	165	204	227	233	247	271	269	269	299	407	438	2,336.02
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Santa Margarita WD	547	619	618	945	1,571	1,666	1,746	1,962	1,956	2,274	2,386	2,386	14,007.83
Seal Beach	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Serrano WD	0	0	0	0	0	0	0	0	0	0	0	0	0.00
South Coast WD	0	0	0	62	117	108	110	118	118	118	164	164	818.21
Trabuco Canyon WD	0	0	0	12	49	48	62	60	60	60	60	60	346.24
Tustin	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Westminster	0	0	0	10	18	18	20	18	18	18	18	18	115.17
Yorba Linda WD	0	0	0	0	0	0	0	0	0	0	0	0	0.00
MWDOC Totals	**1,406**	**1,785**	**1,969**	**2,733**	**4,395**	**10,025**	**10,787**	**11,273**	**11,766**	**12,196**	**12,435**	**12,500**	**70,425.9**
Anaheim	0	0	0	0	0	142	146	144	190	190	190	190	1,147.97
Fullerton	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	**0**	**0**	**0**	**0**	**0**	**142**	**146**	**144**	**190**	**190**	**190**	**190**	**1,147.97**
Orange Co. Totals	**1,406**	**1,785**	**1,969**	**2,733**	**4,395**	**10,167**	**10,933**	**11,417**	**11,956**	**12,386**	**12,625**	**12,690**	**71,573.83**

INDUSTRIAL PROCESS WATER USE REDUCTION PROGRAM

Number of Process Changes by Agency

Agency	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	Overall Program Interventions	Annual Water Savings[1]	Cumulative Water Savings across all Fiscal Years[1]
Brea	0	0	0	0	0	0	0	0	0	0	0	0
Buena Park	0	1	0	0	0	0	0	0	0	1	54	365
East Orange	0	0	0	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	0	0	0	0	0	0
Fountain Valley	0	0	0	0	0	0	0	0	0	0	0	0
Garden Grove	0	0	0	0	0	0	0	0	0	0	0	0
Golden State	1	0	0	0	0	0	0	0	0	1	3	22
Huntington Beach	0	0	0	0	0	2	0	1	0	3	127	234
Irvine Ranch	0	0	2	1	1	1	1	0	0	6	98	366
La Habra	0	0	0	0	0	0	0	0	0	0	0	0
La Palma	0	0	0	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	0	0	0	0	1	0	1	21	18
Orange	1	0	0	0	0	0	0	0	0	1	43	330
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	0	0	0	0	0	0	0	0
Trabuco Canyon	0	0	0	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	0	0	0	0	0
MWDOC Totals	2	1	2	1	1	3	1	2	0	13	346	1335
Anaheim	0	0	0	0	0	0	0	0	0	0	0	0
Fullerton	0	0	0	0	0	0	0	0	0	0	0	0
Santa Ana	0	0	0	0	0	0	0	0	1	1	11	23
OC Totals	2	1	2	1	1	3	1	2	1	14	357	1357

[1] Acre feet of savings determined during a one year monitoring period.

If monitoring data is not available, the savings estimated in agreement is used.

HIGH EFFICIENCY TOILETS (HETs) INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	2	7	43	48	8	0	0	38	146	115	407	**56.69**
Buena Park	0	1	2	124	176	7	0	0	96	153	75	634	**126.10**
East Orange CWD RZ	0	0	10	12	1	0	0	0	13	26	16	78	**12.77**
El Toro WD	0	392	18	75	38	18	0	133	218	869	159	1,920	**346.39**
Fountain Valley	0	69	21	262	54	17	0	0	41	132	144	740	**169.64**
Garden Grove	0	14	39	443	181	24	0	0	63	350	276	1,390	**281.36**
Golden State WC	2	16	36	444	716	37	80	2	142	794	385	2,654	**514.92**
Huntington Beach	2	13	59	607	159	76	0	0	163	1,190	455	2,724	**443.98**
Irvine Ranch WD	29	1,055	826	5,088	2,114	325	0	1,449	810	1,777	1,398	14,871	**3,784.91**
Laguna Beach CWD	0	2	17	91	28	11	0	0	45	112	42	348	**66.56**
La Habra	0	3	18	296	34	20	0	0	37	94	52	554	**139.13**
La Palma	0	1	10	36	26	13	0	0	21	59	34	200	**36.73**
Mesa Water	0	247	19	736	131	7	0	0	147	162	116	1,565	**441.29**
Moulton Niguel WD	0	20	104	447	188	46	0	0	400	2,497	1,455	5,157	**593.83**
Newport Beach	0	5	19	163	54	13	0	0	49	168	141	612	**110.87**
Orange	1	20	62	423	79	40	0	1	142	978	329	2,075	**326.05**
San Juan Capistrano	0	10	7	76	39	11	0	0	35	140	143	461	**69.71**
San Clemente	0	7	22	202	66	21	0	0	72	225	178	793	**141.13**
Santa Margarita WD	0	5	14	304	151	44	0	0	528	997	721	2,764	**350.18**
Seal Beach	0	678	8	21	12	1	0	2	17	50	45	834	**311.28**
Serrano WD	2	0	1	13	5	0	0	0	2	40	37	100	**12.47**
South Coast WD	2	2	29	102	41	12	23	64	102	398	175	950	**133.04**
Trabuco Canyon WD	0	0	4	23	23	0	0	0	10	108	107	275	**31.24**
Tustin	0	186	28	387	479	17	0	0	64	132	137	1,430	**393.93**
Westminster	0	17	25	541	167	23	0	0	35	161	287	1,256	**287.02**
Yorba Linda WD	0	14	89	323	96	18	0	0	40	280	278	1,138	**223.99**
MWDOC Totals	38	2,779	1,494	11,282	5,106	809	103	1,651	3,330	12,038	7,300	45,930	**9,405.17**
Anaheim	0	255	78	2,771	619	114	0	0	156	1,188	400	5,581	**1,433.43**
Fullerton	0	4	28	286	60	23	0	0	61	293	193	948	**174.49**
Santa Ana	0	11	25	925	89	23	0	0	33	602	209	1,917	**425.93**
Non-MWDOC Totals	0	270	131	3,982	768	160	0	0	250	2,083	802	8,446	**2,033.86**
Orange County Totals	**38**	**3,049**	**1,625**	**15,264**	**5,874**	**969**	**103**	**1,651**	**3,580**	**14,121**	**8,102**	**54,376**	**11,439.03**

TURF REMOVAL BY AGENCY[1]

through MWDOC and Local Agency Conservation Programs

Agency	FY 10/11		FY 11/12		FY 12/13		FY 13/14		FY 14/15		FY 15/16		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	**0**	**0**	3,397	9,466	7,605	0	5,697	0	71,981	30,617	12,421	0	101,101	40,083	**46.12**
Buena Park	**0**	**0**	0	0	0	0	0	0	11,670	1,626	5,827	0	17,497	1,626	**4.54**
East Orange	**0**	**0**	0	0	0	0	1,964	0	18,312	0	6,921	0	27,197	0	**6.92**
El Toro	**0**	**0**	4,723	0	4,680	72,718	4,582	0	27,046	221,612	15,277	86,846	56,308	381,176	**132.49**
Fountain Valley	**0**	**0**	1,300	0	682	7,524	4,252	0	45,583	5,279	5,869	0	57,686	12,803	**22.35**
Garden Grove	**0**	**46,177**	14,013	0	4,534	0	8,274	0	67,701	22,000	13,443	0	107,965	68,177	**81.61**
Golden State	**0**	**0**	42,593	30,973	31,813	3,200	32,725	8,424	164,507	190,738	29,919	0	301,557	233,335	**192.04**
Huntington Beach	**801**	**3,651**	27,630	48,838	9,219	12,437	20,642	0	165,600	58,942	54,016	7,426	277,908	131,294	**149.53**
Irvine Ranch	**5,423**	**12,794**	6,450	1,666	32,884	32,384	36,584	76,400	234,905	317,999	70,450	1,174,609	386,696	1,615,852	**434.10**
La Habra	**0**	**7,775**	0	8,262	0	0	0	0	14,014	1,818	6,127	2,936	20,141	20,791	**18.02**
La Palma	**0**	**0**	0	0	0	0	0	0	4,884	0	500	57,400	5,384	57,400	**9.47**
Laguna Beach	**978**	**0**	2,533	0	2,664	1,712	4,586	226	13,647	46,850	2,693	0	27,101	48,788	**24.38**
Mesa Water	**0**	**0**	6,777	0	10,667	0	22,246	0	131,675	33,620	18,947	0	190,312	33,620	**68.99**
Moulton Niguel	**956**	**16,139**	4,483	26,927	11,538	84,123	14,739	40,741	314,250	1,612,845	80,041	127,043	426,007	1,907,818	**681.78**
Newport Beach	**0**	**0**	3,454	0	3,548	2,346	894	0	33,995	65,277	1,064	55,287	42,955	122,910	**41.78**
Orange	**0**	**0**	12,971	0	15,951	8,723	11,244	0	120,093	281,402	19,781	0	180,040	290,125	**142.80**
San Clemente	**0**	**0**	21,502	0	16,062	13,165	18,471	13,908	90,349	1,137	18,718	392,742	165,102	420,952	**128.24**
San Juan Capistrano	**0**	**0**	22,656	103,692	29,544	27,156	12,106	0	101,195	32,366	13,778	19,598	179,279	182,812	**167.35**
Santa Margarita	**4,483**	**5,561**	1,964	11,400	10,151	11,600	17,778	48,180	211,198	514,198	104,454	178,666	350,028	769,605	**300.42**
Seal Beach	**0**	**0**	0	0	3,611	0	0	0	15,178	504	2,159	0	20,948	504	**6.72**
Serrano	**0**	**0**	0	0	0	0	2,971	0	41,247	0	32,545	0	76,763	0	**17.35**
South Coast	**0**	**16,324**	6,806	0	9,429	4,395	15,162	116,719	84,282	191,853	46,342	0	162,021	329,291	**165.41**
Trabuco Canyon	**0**	**0**	272	0	1,542	22,440	2,651	0	14,771	0	5,436	66,964	24,672	89,404	**29.00**
Tustin	**0**	**0**	0	0	9,980	0	1,410	0	71,285	14,137	13,567	1,700	96,242	15,837	**32.24**
Westminster	**0**	**0**	0	0	0	0	0	0	14,040	34,631	11,354	0	25,394	34,631	**15.22**
Yorba Linda	**11,349**	**0**	0	0	0	0	0	0	112,136	12,702	51,470	54,587	174,955	67,289	**59.33**
MWDOC Totals	**23,990**	**108,421**	**183,524**	**241,224**	**216,104**	**303,923**	**238,978**	**304,598**	**2,195,544**	**3,692,153**	**643,119**	**2,225,804**	**3,501,259**	**6,876,123**	**2,978.20**
Anaheim	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Fullerton	**0**	**0**	0	0	0	0	0	9,214	0	0	0	0	0	9,214	**3.87**
Santa Ana	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Non-MWDOC Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9,214**	**0**	**0**	**0**	**0**	**0**	**9,214**	**3.87**
Orange County Totals	**23,990**	**108,421**	**183,524**	**241,224**	**216,104**	**303,923**	**238,978**	**313,812**	**2,195,544**	**3,692,153**	**643,119**	**2,225,804**	**3,501,259**	**6,885,337**	**2,982**

[1]Installed device numbers are listed as square feet

HOME WATER SURVEYS PERFORMED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 13/14		FY 14/15		FY 15/16		Total		Cumulative
	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	Surveys	Cert Homes	Water Savings
Brea	1	0	2	0	0	0	3	0	0.16
Buena Park	0	0	1	0	0	0	1	0	0.05
East Orange	19	0	1	0	0	0	20	0	1.39
El Toro	0	0	3	0	0	0	3	0	0.14
Fountain Valley	3	0	4	0	0	0	7	0	0.40
Garden Grove	0	0	6	0	1	0	7	0	0.31
Golden State	0	0	0	0	0	0	0	0	0.00
Huntington Beach	2	0	5	0	2	0	9	0	0.42
Irvine Ranch	1	0	3	0	5	0	9	0	0.33
La Habra	0	0	1	0	0	0	1	0	0.05
La Palma	0	0	0	0	0	0	0	0	0.00
Laguna Beach	4	0	8	0	1	0	13	0	0.68
Mesa Water	0	0	0	0	0	0	0	0	0.00
Moulton Niguel	4	0	4	0	0	0	8	0	0.47
Newport Beach	2	0	8	0	3	0	13	0	0.59
Orange	2	0	18	0	1	0	21	0	1.01
San Clemente	15	0	13	0	0	0	28	0	1.67
San Juan Capistrano	4	0	13	0	2	0	19	0	0.94
Santa Margarita	15	0	40	1	12	0	67	1	3.22
Seal Beach	0	0	1	0	1	0	2	0	0.07
Serrano	0	0	2	0	0	0	2	0	0.09
South Coast	6	0	4	0	1	0	11	0	0.64
Trabuco Canyon	0	0	4	0	0	0	4	0	0.19
Tustin	0	0	10	0	4	0	14	0	0.56
Westminster	0	0	0	0	0	0	0	0	0.00
Yorba Linda	0	0	13	0	8	0	21	0	0.80
MWDOC Totals	**78**	**0**	**164**	**1**	**41**	**0**	**283**	**1**	**14.18**
Anaheim	0	0	0	0	0	0	0	0	0.00
Fullerton	0	0	17	0	1	0	18	0	0.82
Santa Ana	0	0	0	0	0	0	0	0	0.00
Non-MWDOC Totals	**0**	**0**	**17**	**0**	**1**	**0**	**18**	**0**	**0.82**
Orange County Totals	**78**	**0**	**181**	**1**	**42**	**0**	**301**	**1**	**15.007**

SYNTHETIC TURF INSTALLED BY AGENCY[1]

through MWDOC and Local Agency Conservation Programs

Agency	FY 07/08		FY 08/09		FY 09/10		FY 10/11		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	0	0	2,153	2,160	500	0	0	0	2,653	2,160	3.30
Buena Park	0	0	1,566	5,850	0	0	0	0	1,566	5,850	5.19
East Orange	0	0	0	0	983	0	0	0	983	0	0.55
El Toro	3,183	0	2,974	0	3,308	0	895	0	10,360	0	6.98
Fountain Valley	11,674	0	1,163	0	2,767	0	684	0	16,288	0	12.46
Garden Grove	1,860	0	0	0	3,197	0	274	0	5,331	0	3.47
Golden State	6,786	0	13,990	0	15,215	0	2,056	0	38,047	0	24.88
Huntington Beach	15,192	591	12,512	0	4,343	1,504	0	0	32,047	2,095	25.29
Irvine Ranch	11,009	876	13,669	0	2,585	0	0	0	27,263	876	21.00
La Habra	0	0	0	0	0	0	0	0	0	0	-
La Palma	429	0	0	0	0	0	0	0	429	0	0.36
Laguna Beach	3,950	0	3,026	0	725	0	0	0	7,701	0	5.84
Mesa Water	4,114	0	3,005	78,118	4,106	0	2,198	0	13,423	78,118	63.46
Moulton Niguel	14,151	0	25,635	2,420	7,432	0	0	0	47,218	2,420	35.69
Newport Beach	2,530	0	6,628	0	270	0	0	0	9,428	0	6.92
Orange	4,169	0	7,191	0	635	0	0	0	11,995	0	8.89
San Clemente	9,328	0	11,250	455	2,514	1,285	500	0	23,592	1,740	18.37
San Juan Capistrano	0	0	7,297	639	2,730	0	4,607	0	14,634	639	9.02
Santa Margarita	12,922	0	26,069	0	21,875	0	7,926	0	68,792	0	44.68
Seal Beach	0	0	817	0	0	0	0	0	817	0	0.57
Serrano	7,347	0	1,145	0	0	0	0	0	8,492	0	6.97
South Coast	2,311	0	6,316	0	17,200	0	1,044	0	26,871	0	16.43
Trabuco Canyon	1,202	0	9,827	0	0	0	0	0	11,029	0	7.89
Tustin	6,123	0	4,717	0	2,190	0	0	0	13,030	0	9.67
Westminster	2,748	16,566	8,215	0	890	0	0	0	11,853	16,566	22.47
Yorba Linda	11,792	0	12,683	0	4,341	5,835	0	0	28,816	5,835	24.48
MWDOC Totals	132,820	18,033	181,848	89,642	97,806	8,624	20,184	0	432,658	116,299	384.83
Anaheim	4,535	0	7,735	20,093	13,555	65,300	4,122	0	29,947	85,393	69.18
Fullerton	4,865	876	5,727	0	6,223	0	105	0	16,920	876	12.36
Santa Ana	0	0	2,820	0	525	0	0	0	3,345	0	2.27
Non-MWDOC Totals	9,400	876	16,282	20,093	20,303	65,300	4,227	0	50,212	86,269	83.81
Orange County Totals	142,220	18,909	198,130	109,735	118,109	73,924	24,411	0	482,870	202,568	468.63

[1]Installed device numbers are calculated in square feet

ULF TOILETS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	Previous Years	FY 95-96	FY 96-97	FY 97-98	FY 98-99	FY 99-00	FY 00-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	Total	Cumulative Water Savings across all Fiscal Years
Brea	378	189	299	299	122	144	867	585	341	401	26	48	17	4	0	**3,720**	**1,692.64**
Buena Park	361	147	331	802	520	469	524	1,229	2,325	1,522	50	40	18	9	0	**8,347**	**3,498.37**
East Orange CWD RZ	2	0	33	63	15	17	15	50	41	44	19	18	13	2	0	**332**	**138.23**
El Toro WD	1,169	511	678	889	711	171	310	564	472	324	176	205	61	40	0	**6,281**	**3,091.16**
Fountain Valley	638	454	635	858	1,289	2,355	1,697	1,406	1,400	802	176	111	58	32	0	**11,911**	**5,383.10**
Garden Grove	1,563	1,871	1,956	2,620	2,801	3,556	2,423	3,855	3,148	2,117	176	106	67	39	0	**26,298**	**12,155.41**
Golden State WC	3,535	1,396	3,141	1,113	3,024	2,957	1,379	2,143	3,222	1,870	167	116	501	43	0	**24,607**	**11,731.47**
Huntington Beach	3,963	1,779	2,600	2,522	2,319	3,492	3,281	2,698	3,752	1,901	367	308	143	121	0	**29,246**	**13,854.70**
Irvine Ranch WD	4,016	841	1,674	1,726	1,089	3,256	1,534	1,902	2,263	6,741	593	626	310	129	0	**26,700**	**11,849.23**
Laguna Beach CWD	283	93	118	74	149	306	220	85	271	118	32	26	29	6	0	**1,810**	**845.69**
La Habra	594	146	254	775	703	105	582	645	1,697	1,225	12	31	6	7	0	**6,782**	**2,957.73**
La Palma	65	180	222	125	44	132	518	173	343	193	31	27	20	17	0	**2,090**	**927.52**
Mesa Water	1,610	851	1,052	2,046	2,114	1,956	1,393	1,505	2,387	988	192	124	56	14	0	**16,288**	**7,654.27**
Moulton Niguel WD	744	309	761	698	523	475	716	891	728	684	410	381	187	100	0	**7,607**	**3,371.14**
Newport Beach	369	293	390	571	912	1,223	438	463	396	1,883	153	76	36	16	0	**7,219**	**3,166.77**
Orange	683	1,252	1,155	1,355	533	2,263	1,778	2,444	2,682	1,899	193	218	88	53	4	**16,600**	**7,347.93**
San Juan Capistrano	1,234	284	193	168	323	1,319	347	152	201	151	85	125	42	39	0	**4,663**	**2,324.42**
San Clemente	225	113	191	65	158	198	667	483	201	547	91	66	37	34	0	**3,076**	**1,314.64**
Santa Margarita WD	577	324	553	843	345	456	1,258	790	664	260	179	143	101	29	0	**6,522**	**3,001.01**
Seal Beach	74	66	312	609	47	155	132	81	134	729	29	10	6	12	0	**2,396**	**1,073.80**
Serrano WD	81	56	68	41	19	52	95	73	123	98	20	15	14	2	0	**757**	**338.66**
South Coast WD	110	176	177	114	182	181	133	358	191	469	88	72	32	22	0	**2,305**	**990.05**
Trabuco Canyon WD	10	78	42	42	25	21	40	181	102	30	17	20	12	14	0	**634**	**273.02**
Tustin	968	668	557	824	429	1,292	1,508	1,206	1,096	827	69	89	26	12	0	**9,571**	**4,423.88**
Westminster	747	493	969	1,066	2,336	2,291	2,304	1,523	2,492	1,118	145	105	70	24	0	**15,683**	**7,064.28**
Yorba Linda WD	257	309	417	457	404	1,400	759	1,690	1,155	627	158	136	81	41	0	**7,891**	**3,409.49**
MWDOC Totals	24,256	12,879	18,778	20,765	21,136	30,242	24,918	27,175	31,827	27,568	3,654	3,242	2,031	861	4	**249,336**	**113,878.61**
Anaheim	447	1,054	1,788	3,661	1,755	7,551	4,593	6,346	9,707	5,075	473	371	462	341	1	**43,625**	**18,359.52**
Fullerton	1,453	1,143	694	1,193	1,364	2,138	1,926	2,130	2,213	1,749	172	77	44	23	2	**16,321**	**7,435.23**
Santa Ana	1,111	1,964	1,205	2,729	2,088	8,788	5,614	10,822	10,716	9,164	279	134	25	5	0	**54,644**	**22,887.95**
Non-MWDOC Totals	3,011	4,161	3,687	7,583	5,207	18,477	12,133	19,298	22,636	15,988	924	582	531	369	3	**114,590**	**48,682.70**
Orange County Totals	27,267	17,040	22,465	28,348	26,343	48,719	37,051	46,473	54,463	43,556	4,578	3,824	2,562	1,230	7	**363,926**	**162,561.30**

APPENDIX I

CUWCC BMP Report

Reporting Unit:**El Toro Water District**
Signatory:**El Toro Water District**
RU Type:**Retail**

Welcome **Michael King** | Logout
Role:Data Entry User

Home | Annual Input Forms | Base Year Data | Reports | Reporting Unit

Reporting Year

< **2014** >

Water Sources and Usage

- **Potable Water Sources**
- Non Potable Water Sources
- Potable Water Uses
- Non Potable Water Uses
- BMP 1
- 1.1 Retail Operations Practices
- 1.2 Retail Water Loss Control
- 1.3 Retail Metering with Commodity
- 1.4 Retail Conservation Pricing
- BMP 2
- 2.1 Public Information Programs
- 2.2 School Education
- BMP 3 - Residential
- 3 Traditional / FlexTrack
- BMP 4 - CII
- 4 Traditional / FlexTrack
- BMP 5 - Landscape
- 5 Traditional / FlexTrack
- GPCD
- GPCD

Potable Water Sources

Online Help

☑ Form Complete

Submited to CUWCC
10/12/2015 11:09:43 AM

Form Status: Submitted

Service Area Population: 48,183

Copy from previous year | Save

Potable

Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
MWDOC	9,985.6	Surface	

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
No data to display			
Total: 0.00			

Back to Top

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

Non Potable Water Sources

Online Help

☑Form Complete

Submited to CUWCC
10/12/2015 11:09:43 AM

Form Status: Submitted

Service Area Population: 48,183

Copy from previous year | Save

Non Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
No data to display			

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
Water Recycling Plant-WRP	434.81	Recycled Non Potable	Total Effluent Used/Produced
Total: 434.81			

Back to Top

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

Potable Water Uses

Online Help

☑ Form Complete

Submited to CUWCC
10/12/2015 11:09:43 AM

Copy from previous year | Save

Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Single-Family	5,683	2,377.68	0	0.00	
Multi-Family	2,610	3,232.12	0	0.00	
Commercial	774	1,070.87	0	0.00	
Fire Lines	165	1.00	0	0.00	
Dedicated Irrigation	813	2,641.57	0	0.00	
Institutional	22	73.98	0	0.00	
		Total : 9,397.22		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
No data to display					
		Total : 0.00		Total : 0.00	

Back to Top

Reporting Year

< 2014 >

Water Sources and Usage
Potable Water Sources
Non Potable Water Sources
Potable Water Uses
Non Potable Water Uses
BMP 1
1.1 Retail Operations Practices
1.2 Retail Water Loss Control
1.3 Retail Metering with Commodity
1.4 Retail Conservation Pricing
BMP 2
2.1 Public Information Programs
2.2 School Education
BMP 3 - Residential
3 Traditional / FlexTrack
BMP 4 - CII
4 Traditional / FlexTrack
BMP 5 - Landscape
5 Traditional / FlexTrack
GPCD
GPCD

Non Potable Water Uses

Online Help

☑Form Complete

Submited to CUWCC 10/12/2015 11:09:43 AM

Copy from previous year | Save

Form Status: Submitted

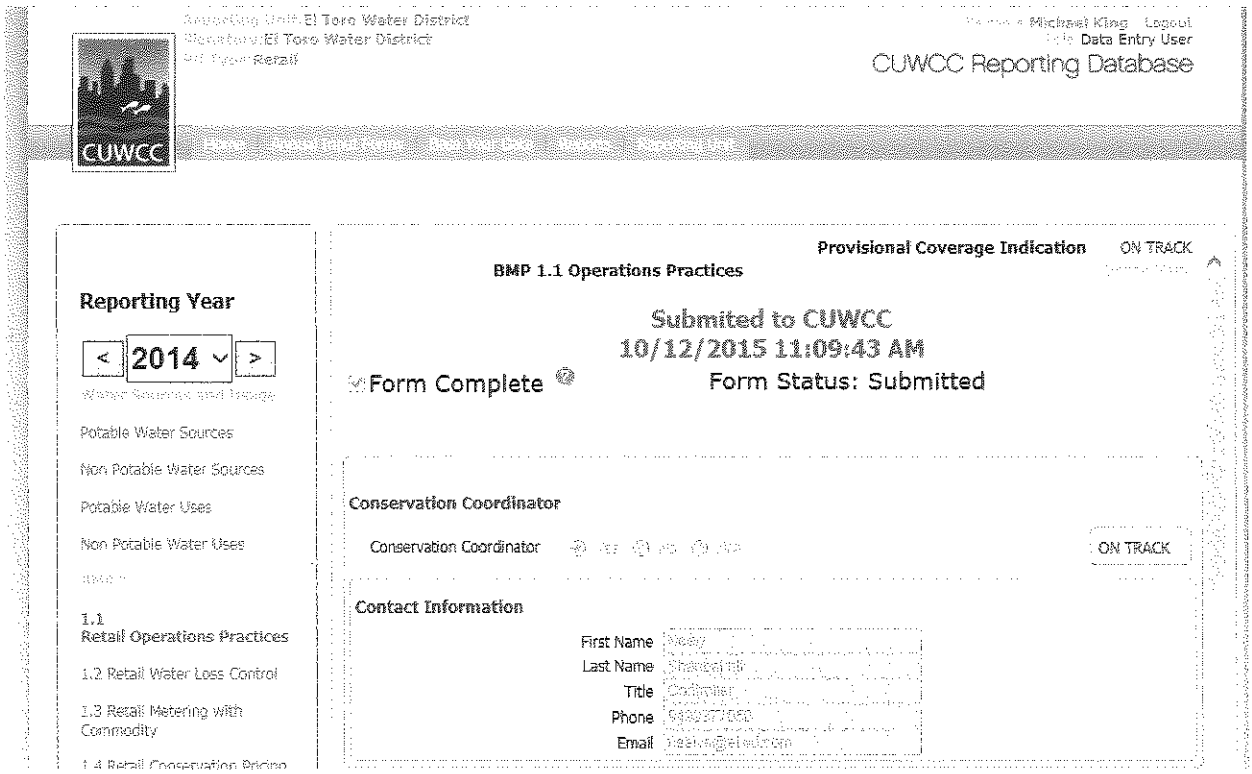
Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Other	1	405.85	0	0.00	1 Customer-27-Hole Golf Course
		Total : 405.85		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
No data to display					
		Total : 0.00		Total : 0.00	

Back to Top


Reporting Unit: El Toro Water District
Signatory: El Toro Water District
Unit Type: Retail
Michael King Logout
Role: Data Entry User
CUWCC Reporting Database
CUWCC
Reporting Year
< 2014 >
Potable Water Sources
Non Potable Water Sources
Potable Water Uses
Non Potable Water Uses
1.1
Retail Operations Practices
1.2 Retail Water Loss Control
1.3 Retail Metering with Commodity
Provisional Coverage Indication ON TRACK
BMP 1.1 Operations Practices
Submited to CUWCC
10/12/2015 11:09:43 AM
Form Complete
Form Status: Submitted
Conservation Coordinator
Conservation Coordinator
ON TRACK
Contact Information
First Name
Last Name
Title
Phone
Email

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

Water Waste Prevention

An agency MUST do at least one or more of the following six strategies; although water agencies are encouraged to do them all when possible.

☑ Option A: Describe (upload or provide an electronic link) the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.

ON TRACK

Upload File

NA

URL http://etwd.com/wp-content/uploads/2014/05/Ordinance.

Describe Ordinance or Terms

107 characters remaining

Water Waste Prevention is covered by El Toro Water District's Water Conservation and Water Supply Shortage Ordinance 2010-1 effective 1/1/2011.

☐ **Option B:** Describe (upload or provide an electronic link) any water waste prevention ordinances or requirements adopted by your local jurisdiction(s) or regulatory agencies within your service area.

Upload File

NA

URL

Describe Ordinances or Requirements

250 characters remaining

Reporting Year

< 2014 >

Water Shipping and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

Start >

1.1
Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

Next >

2.1 Public Information Programs

2.2 School Education

Next > Participation

Option C: Describe (upload or provide an electronic link) any documentation of support for legislation or regulations that prohibit water waste.

Upload File

NA

URL

Describe the support provided for legislation or regulations that prohibit water waste. *250 characters remaining*

Option D: Describe your agency's efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.

Upload File

NA

Describe Efforts *250 characters remaining*

Reporting Year

< 2014 >

Water Shortage and Drought

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1
Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

Option E: Describe your agency's support positions with respect to adoption of legislation and/or regulations that are consistent with this BMP.

Upload File

NA

Describe Legislation

250 characters remaining

Option F: Describe your agency's efforts to support local ordinances that establish permits requirements for water efficient design in new development.

Upload File

NA

Describe Legislation

250 characters remaining

1.1
Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

At Least As Effective As

Is your agency implementing an "At Least As Effective As" variant of this BMP? Yes No N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type :

Please Upload Document(s) for Exemption

Select An Exemption Type

NA

Comments

250 characters remaining

Reporting Unit: El Toro Water District
Agency: El Toro Water District
Michael King Logout
Data Entry User
CUWCC Reporting Database

Reporting Year

< 2014 >

Water Sources and Usage
Potable Water Sources
Non Potable Water Sources
Potable Water Uses
Non Potable Water Uses
1.1 Retail Operations Practices
1.2 Retail Water Loss Control
1.3 Retail Metering with Commodity
1.4 Retail Conservation Pricing
2.1 Public Information Programs
2.2 School Education

Provisional Coverage Indication NOT ON TRACK

BMP 1.2 Water Loss Control

Submited to CUWCC
10/12/2015 11:09:43 AM

Form Complete Form Status: Submitted

AWWA Water Audit

Agency to complete a water audit and balance using the AWWA software — ON TRACK

Upload Worksheets (AWWA Water Audit) — ON TRACK

Uploaded filename:
Copy of AWWA Water Audit BMP 2014 2003.xls

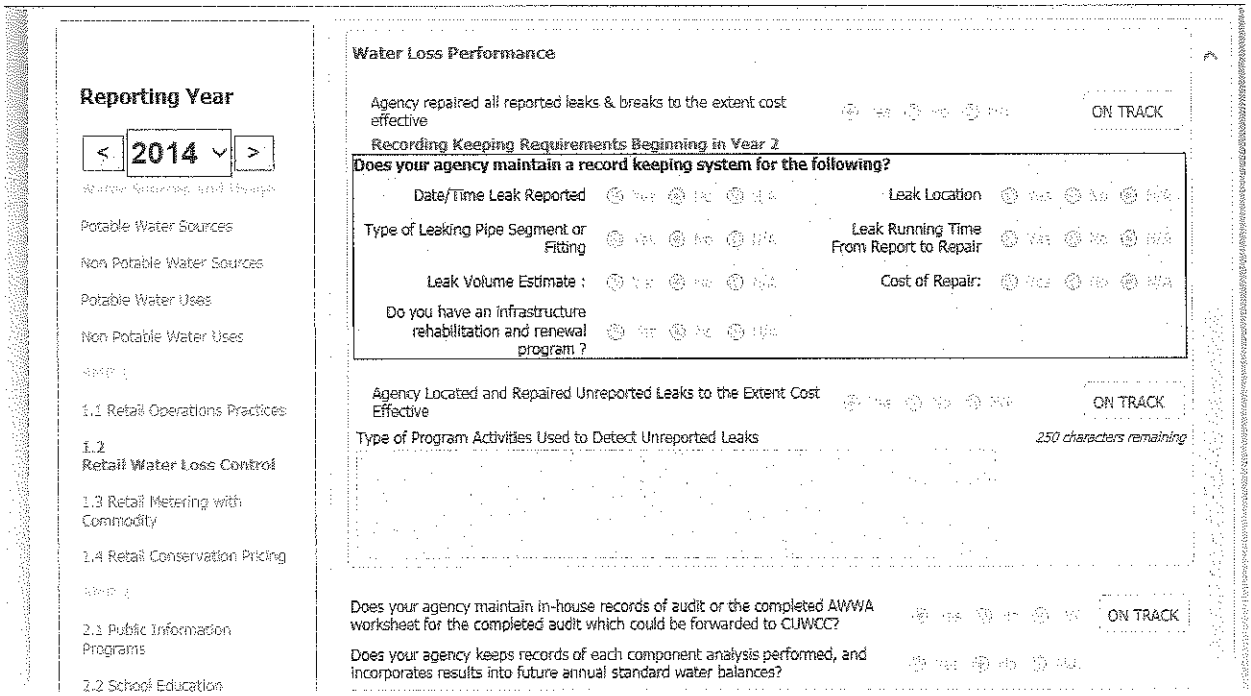
Water Audit Validity Score

Agency Completed Training In The AWWA Water Audit Method — ON TRACK

Agency Completed Training In The Component Analysis Process — ON TRACK

Completed/Updated the Component Analysis (at least every 4 years) (Effective from 2013) — NOT ON TRACK

Component Analysis Completed/Updated Date: format:mm/dd/yyyy



Reporting Year

< 2014 >

Water Metering and Charges

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2
Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

Water Loss Performance

Agency repaired all reported leaks & breaks to the extent cost effective — Yes / No / N/A — ON TRACK

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported	Yes / No / N/A	Leak Location	Yes / No / N/A
Type of Leaking Pipe Segment or Fitting	Yes / No / N/A	Leak Running Time From Report to Repair	Yes / No / N/A
Leak Volume Estimate :	Yes / No / N/A	Cost of Repair:	Yes / No / N/A
Do you have an infrastructure rehabilitation and renewal program ?	Yes / No / N/A		

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective — Yes / No / N/A — ON TRACK

Type of Program Activities Used to Detect Unreported Leaks — *250 characters remaining*

Does your agency maintain in-house records of audit or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC? — Yes / No / N/A — ON TRACK

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances? — Yes / No / N/A

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

Goal 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

Goal 2

2.1 Public Information Programs

2.2 School Education

Annual Summary Information NOT ON TRACK

Complete the following table with annual summary information (required for reporting years 2-5 only)

Total Leaks Repaired	Economic Value Of Real Loss	Economic Value Of Apparent Loss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for Loss Reduction	Cost Of Intervention	Linear feet of pipe replaced and rehabilitated	Water Saved (AF) per

No data to display

Please describe your infrastructure rehabilitation and renewal activity below *219 characters remaining*

Please see 2014 Acreage report

AWWA Model

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1 Retail Operations Practices

1.2
Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

Operational Efficiency Indicator

Apparent Losses per service connection per day:	
Real Losses per service connection per day:	
Real Losses per length of main per day:	
Real Losses per service connection per day per psi pressure:	
Unavoidable Annual Real Losses(UARL):	
Above, Real Losses=Current Annual Real Losses(CARL):	
Infrastructure Leakage Index (ILI) [CARL/UARL]:	
WATER SUPPLIED:	
Reporting Units:	Acre-feet

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? ◉ Yes ○ No ○ N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document As Effective As

NA

Exemption Type

Please Upload Document(s) for Exemption

NA

Comments:

250 characters remaining

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

Provisional Coverage Indication ON TRACK

BMP 1.3 Metering with Commodity Rates

Submited to CUWCC
10/12/2015 11:09:43 AM

Form Complete   Form Status: Submitted

Implementation

ON TRACK

Does your agency have any unmetered service connections?

If YES, has your agency completed a meter retrofit plan?

If YES, number of previously unmetered accounts fitted with meters during reporting year:

ON TRACK

Are all new service connections being metered?

Are all new service connections being billed volumetrically?

ON TRACK

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?

NA

Reporting Year

< 2014 >

Water Savings and Design

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

[illegible]

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

[illegible]

2.1 Public Information Programs

2.2 School Education

[illegible]

3 Traditional / FlexTrack

[illegible]

4 Traditional / FlexTrack

[illegible]

5 Traditional / FlexTrack

[illegible]

GPCD

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# Estimated Bills Per Year	# Of Meter Readings per Year
Single-Family	5,683.00	5,683.00	5,683.00	Monthly		
Multi-Family	2,610.00	2,610.00	2,610.00	Monthly		
Commercial	774.00	774.00	774.00	Monthly		
Fire Lines	165.00	165.00	165.00	Monthly		
Dedicated Irrigation	813.00	813.00	813.00	Monthly		
Institutional	22.00	22.00	22.00	Monthly		

Number of CII Accounts with Mixed-used Meters

Number of CII Accounts with Mixed-used Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period

Feasibility Study ON TRACK

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe *250 characters remaining*

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

At Least As Effective As

Is your agency implementing an "at least as effective as" variant of this BMP?

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Please Upload Document(s) for Exemption

NA

Comments

Comments On Metering with Commodity Rates

250 characters remaining

El Toro Water District
El Toro Water District
Retail

Michael King Logout
Data Entry User
CUWCC Reporting Database

CUWCC

Reporting Year

< 2014 >

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

Provisional Coverage Indication

BMP 1.4 Retail Conservation Pricing

Submited to CUWCC
10/12/2015 11:09:43 AM

Form Complete

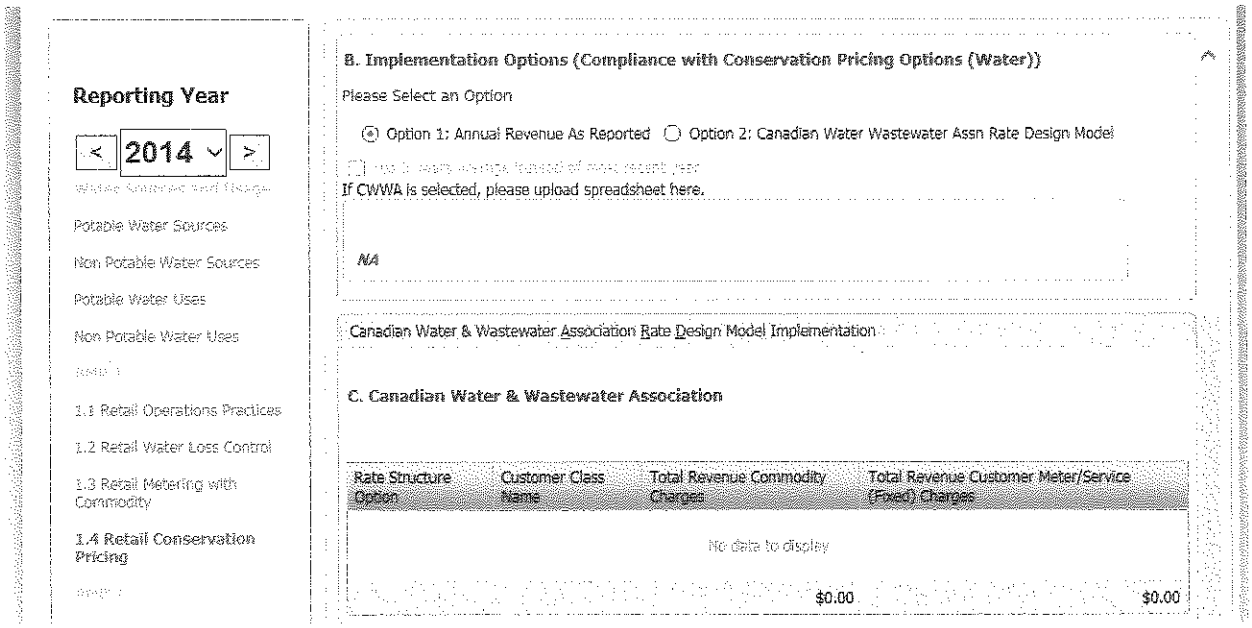
Form Status: Submitted

A. Implementation (Water Rate Structure)

Based on Rate Structure Not On Track
Based on Revenue Not On Track

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges	New
Allocation Based	Single-Family	2,583,143.00	1,104,421.00	Edit Delete
Allocation Based	Multi-Family	3,441,721.00	1,386,045.00	Edit Delete
Uniform	Commercial	1,129,782.00	566,607.00	Edit Delete
Uniform	Institutional	80,813.00	118,727.00	Edit Delete
Allocation Based	Dedicated Irrigation	3,451,937.00	803,953.00	Edit Delete
		$10,687,396.00	$3,979,753.00	



Reporting Year

< 2014 >

Water Conservation Pricing

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

Water Loss

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

Water Rates

B. Implementation Options (Compliance with Conservation Pricing Options (Water))

Please Select an Option

(•) Option 1: Annual Revenue As Reported ( ) Option 2: Canadian Water Wastewater Assn Rate Design Model

[ ] Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

NA

Canadian Water & Wastewater Association Rate Design Model Implementation

C. Canadian Water & Wastewater Association

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
No data to display			
		$0.00	$0.00

Reporting Year

< 2014 >

Water Sources and Uses

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

D. Retail Waste Water (Sewer) Rate Structure by Customer Class On Track

Does your agency provide sewer service? (•) Yes ( ) No ( ) N/A

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
Non-Volumetric Flat Rate	Single-Family		1,624,189.00
Non-Volumetric Flat Rate	Multi-Family		4,529,717.00
Uniform	Commercial	1,373,258.00	321,144.00
Uniform	Institutional	44,209.00	8,811.00
		$1,417,467.00	$6,483,861.00

Option 1: Click here to use option 1 and/or to report your Agency's good faith efforts - redirects to new page

At Least As Effective As

Agency is implementing an 'At Least As Effective As' variant of this BMP? ( ) Yes (•) No ( ) N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

Exemption Request

If agency has requested an exemption then please select a exemption type.

Exemption Type *

Please Upload Document(s)

NA

Comments on Conservation Pricing BMP

250 characters remaining

Back to Top

Signatory: El Toro Water District
Retail

Michael King | Logout
Data Entry User

CUWCC Reporting Database

CUWCC

Reporting Year

< 2014 >

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

Provisional Coverage Indication ON TRACK

BMP 2.1 Public Information Programs

Submited to CUWCC
10/12/2015 11:09:43 AM

☑ Form Complete

Form Status: Submitted

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP?

If "Yes" please select council wholesale agencies:

Metropolitan Water District of SC,Municipal Water D

Please provide the name of agency , contact name and email address if not A Council Group 1 member.

200 characters remaining

Report a minimum of four water conservation related contacts your agency had with the public during the year.

ON TRACK

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

Water Loss

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

Water Conservation

2.1 Public Information Programs

2.2 School Education

ON TRACK

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ☑

Number of Public Contacts	Public Information Programs
4	Newsletter articles on conservation
6	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
1	Website
31	General water conservation information
2	Landscape water conservation media campaigns
44	

Contact with the Media

ON TRACK

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ☑

Number of Media Contacts	Media Contacts Type
8	Articles or stories resulting from outreach
8	Newspaper contacts
11	Television contacts
27	

Reporting Year

< 2014 >

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

Agency Website Updates

238 characters remaining

Enter your agency's URL (website address):

68 characters remaining

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Did at least one website update take place during each quarter of the reporting year?

ON TRACK

Public Information Programs Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or break the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount	Personnel Costs Included?	Comments
Public Relations	113,000.00	☒	Personnel costs are not included
	$113,000.00		

Public Information Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

ON TRACK

Expense Category	Expense Amount	Personnel Costs Included?
Public Relations	91,219.14	☒
	$91,219.14	

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

[redacted]

2.1 Public Information Programs

2.2 School Education

[redacted]

ALL DATA BELOW ARE OPTIONAL

Additional Public Information Program

You may report additional public information contacts. Please list these additional contacts in order of how your agency views their importance/effectiveness with respect to conserving water, with the most important/effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? [redacted]

Public Outreach Additional Information

Public Information Programs	Importance
No data to display	

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ○ Yes ◉ No ○ N/A

250 characters remaining

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ○ Yes ◉ No ○ N/A

100 characters remaining

Market Research Topic

100 characters remaining

Brand Message

100 characters remaining

Brand Mission Statement

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

Community Committees

Do you have a community conservation committee? ◯ Yes ◉ No ◯ N/A

100 characters remaining

Enter the names of Community Committees:

Training

Training Type	# of Trainings	# of Attendees	Description of Other
No data to display			

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
No data to display		

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

[illegible]

2.1 Public Information Programs

2.2 School Education

[illegible]

3 Traditional / FlexTrack

[illegible]

4 Traditional / FlexTrack

Partnering Programs

Name	Type of Program
CLCA?	
Green Building Programs?	
Master Gardeners?	
Cooperative Extension?	
Local Colleges?	
Other	
Retail and wholesale outlet; name(s) and type(s) of programs:	

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers reached per year

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

Partnering with Other Utilities

250 characters remaining

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

250 characters remaining

Describe water conservation gardens at your agency or other high traffic areas or new homes.

Landscape Contests or Awards

100 characters remaining

Describe water wise landscape contests or awards program conducted by your agency.

250 characters remaining

Additional programs supported by agency but not mentioned above.

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

At Least As Effective As

Is your agency implementing an "At Least As Effective As" Variant of this BMP? ○ Yes ◉ No ○ N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

150 characters remaining

Please Upload Document AsEffectiveAs

NA

Exemption Type

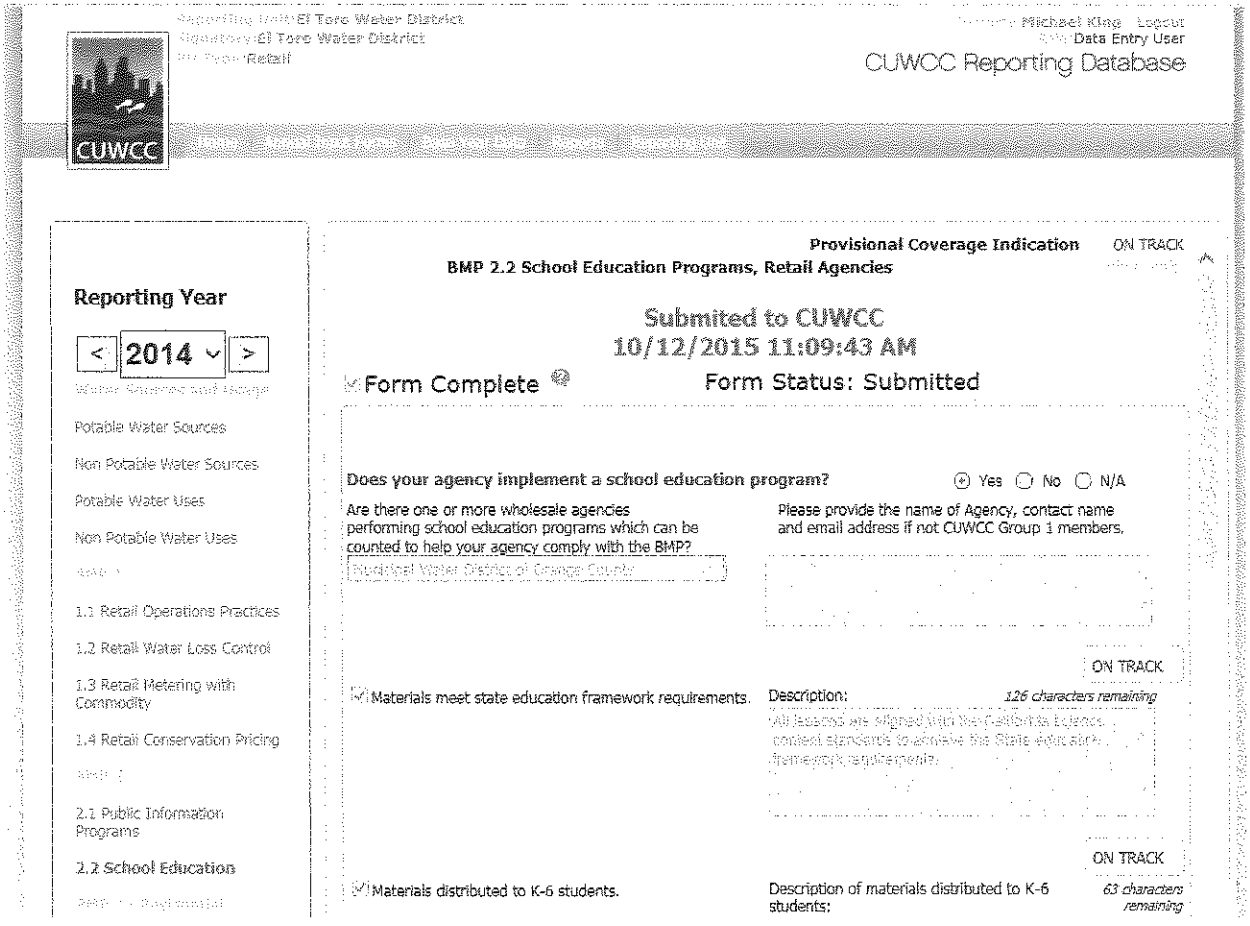
Select an Exemption Type

Please Upload Document(s) for Exemption

NA

Comments:

250 characters remaining


Reporting Unit: El Toro Water District
Signatory: El Toro Water District
Michael King Logout
Data Entry User
CUWCC Reporting Database
Reporting Year
2014
Potable Water Sources
Non Potable Water Sources
Potable Water Uses
Non Potable Water Uses
1.1 Retail Operations Practices
1.2 Retail Water Loss Control
1.3 Retail Metering with Commodity
1.4 Retail Conservation Pricing
2.1 Public Information Programs
2.2 School Education
Provisional Coverage Indication
ON TRACK
BMP 2.2 School Education Programs, Retail Agencies
Submited to CUWCC
10/12/2015 11:09:43 AM
Form Complete
Form Status: Submitted
Does your agency implement a school education program?
Yes
No
N/A
Are there one or more wholesale agencies performing school education programs which can be counted to help your agency comply with the BMP?
Please provide the name of Agency, contact name and email address if not CUWCC Group 1 members.
ON TRACK
Materials meet state education framework requirements.
Description:
126 characters remaining
ON TRACK
Materials distributed to K-6 students.
Description of materials distributed to K-6 students:
63 characters remaining

Reporting Year

< 2014 >

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information

Grade Specific education booklet featuring [illegible] lessons and hands-on activities that are designed to continue water education at home.

Number of student reached. 1660

Materials distributed to 7-12 students. (optional)

Description of materials distributed to 7-12 students *250 characters remaining*

Annual budget for school education program. ON TRACK $ 1000.00

ON TRACK

Description of all other water supplier education programs. *247 characters remaining* N/A

Reporting Year

< 2014 >

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

School Program Activities

Classroom presentations:

Number of presentations

Number of attendees

250 characters remaining

Describe the topics covered in your classroom presentations:

Large group assemblies:

Number of presentations

Number of attendees

Children's water festivals or other events:

Number of presentations

Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations

Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description *250 characters remaining*

Number distributed

Staffing children's booths at events and festivals:

Number of booths

Number of attendees

Water conservation contests such as poster and photo:

Description *250 characters remaining*

Number of Participants

Reporting Year

< 2014 >

Water Sources and Uses

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

Offer monetary awards/funding or scholarships awards to students:

Number offered | Total funding

Teacher training workshops:

Number of presentations | Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips | Number of participants

College internships in water conservation offered:

Number of internships | Total funding

Career fair/workshops:

Number of presentations | Number of attendees

Additional program(s) supported by agency:

Not mentioned above

250 characters remaining

Number of events (if applicable) | Number of participants

Total reporting period budget expenditures for school education programs (include all agency costs):

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

2.1 Public Information Programs

2.2 School Education

3 Traditional / FlexTrack

4 Traditional / FlexTrack

5 Traditional / FlexTrack

GPCD

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? Yes * No N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

150 characters remaining

Please Upload Document AsEffectiveAs

NA

Exemption Type

Please Upload Document(s) for Exemption

NA

Comments: *250 characters remaining*

Reporting Unit:El Toro Water District
Signatory:El Toro Water District
RU Type:Retail

Welcome Michael King | Logout
Role:Data Entry User

Home | Annual Input Forms | Base Year Data | Reports | Reporting Unit

Reporting Year

< 2014 >

- Water Sources and Usage
- Potable Water Sources
- Non Potable Water Sources
- Potable Water Uses
- Non Potable Water Uses
- BMP 1
- 1.1 Retail Operations Practices
- 1.2 Retail Water Loss Control
- 1.3 Retail Metering with Commodity
- 1.4 Retail Conservation Pricing
- BMP 2
- 2.1 Public Information Programs
- 2.2 School Education
- BMP 3 - Residential
- 3 Traditional / FlexTrack
- BMP 4 - CII
- 4 Traditional / FlexTrack
- BMP 5 - Landscape
- 5 Traditional / FlexTrack
- GPCD
- GPCD

BMP 3 Residential

Provisional Coverage Indication
Online Help

☐Form Complete

Save All

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings are saved for future use. Data and equations corresponding to the track you select here are used in this year's coverage report.

Coverage Option GPCD Calculate

Total Measured Water Savings (AF/Year)

Form Status: Not Submitted

Traditional	FlexTrack	Total	FlexTrack Target	Prior Activities Credit
0	0	0	0	

From the Coverage Option drop down menu to the right, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings are saved for future use. Data and equations corresponding to the track you select here are used in this year's coverage report.

Residential Assistance / Landscape Water Survey

Traditional

	Single Family Accounts	Target	Coverage	Multi Family Units	Target	Coverage
Total Number	0			0		
Total Number Of Leak Det Surveys	0	0		0	0	
Total Number Of Showerheads	0					
Total Number Of Faucet Aerators	0			0		
Total Number of Landscape Water Survey	0	0	ONTRACK	0		

Has your agency reached a 75% market saturation for showerheads? Yes No N/A

Flex

Number of Other Measures 0

50 characters remaining

Description of Other Measures Distributed

If there are water savings in this measure, upload your back up data, or a methodology

Measured water savings

Back to Top

V4 - Latest

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

Description of Other Measures Distributed

If there are water savings in this measure, upload your back up data, or a methodology Spreadsheet that you have created.

Browse...

Upload Clear

Measured water savings AF/YR

0

High Efficiency Clothes Washers HECW

(Agency must complete information for at least one coverage option. You are encouraged to include information on other coverage options, as available; if seeking credit for additional water savings, you must fill out FlexTrack.)

Traditional

Target	Coverage
0	

Number of installations for HECWs 0

Enter the Average Water Factor for all installations if it is less than 5.0 5

Are financial incentives provided for HECWs ? ◯ Yes ◯ No ◉ N/A

Has your agency completed a HECW Market Penetration Study ? ◯ Yes ◯ No ◉ N/A

HECW Market Penetration Study Documents

Browse...

Upload Clear

Flex

If there are water savings in this measure, upload your back up data, or a methodology Spreadsheet that you have created.

Browse...

Upload Clear

Measured Water Savings AF/YR

0

WaterSense Specification (WISC) toilets

Back to Top

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

WaterSense Specification (WSS) toilets

Traditional

Retrofit on Resale Ordinance is in Place ○ Yes ○ No ◉ N/A

If Yes, Choose A File

Browse... Upload Clear

A 75% Market Saturation Achieved ○ Yes ○ No ◉ N/A

If Yes, Choose A File

Browse... Upload Clear

WSS Toilets Installed

	Single Family	Multi Family
Number of WSS Toilets Installed	0	0
Target number of WSS toilets	0	0
Coverage	ONTRACK	ONTRACK

Flex

	SingleFamily	MultiFamily
Measured Water Savings AF/YR		

250 characters remaining

Describe your Flex Track toilet program

If there are water savings in this measure, upload your back up data, or a methodology spreadsheet that you have created.

Browse... Upload Clear

Back to Top

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

WSS for New Residential Development

(Agency must complete information for at least one coverage option. You are encouraged to include information on other coverage options, as available; if seeking credit for additional water savings, you must fill out FlexTrack.)

Traditional

	Single Family	Multi Family
Residential Development Rebates	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A
Recognition Programs	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A
Reduced Connection Fees	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A
Ordinances	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A

New development ordinance/regulation

Browse... Upload Clear

Number of new single-family units built in service area 0

Number of new multi-family units built in service area 0

In the following table, enter one row for each incentive type program you offer.

List of Incentive Amounts

Incentive Type	Incentive amount	Number of WSS fixtures installed	Number of Participating Single-Family	Number of Participating Multi-Family	New
No data to display					

Flex

If there are water savings in this measure, upload your back up data, or a methodology spreadsheet that you have created.

Browse... Upload Clear

Measured water savings AF/YR 0

Back to Top

Reporting Unit:El Toro Water District
Signatory:El Toro Water District
RU Type:Retail

Welcome Michael King | Logout
Role:Data Entry User

Home | Annual Input Forms | Base Year Data | Reports | Reporting Unit

Reporting Year

< 2014 >

Water Sources and Usage

- Potable Water Sources
- Non Potable Water Sources
- Potable Water Uses
- Non Potable Water Uses

BMP 1

- 1.1 Retail Operations Practices
- 1.2 Retail Water Loss Control
- 1.3 Retail Metering with Commodity
- 1.4 Retail Conservation Pricing

BMP 2

- 2.1 Public Information Programs
- 2.2 School Education

BMP 3 - Residential

- 3 Traditional / FlexTrack

BMP 4 - CII

- 4 Traditional / FlexTrack

BMP 5 - Landscape

- 5 Traditional / FlexTrack

GPCD

- GPCD

BMP 4 CII

Provisional Coverage Indication
Online Help

☐Form Complete

Save All

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings is saved for future use. Data and equations corresponding to the track you select here is used in this year's coverage report.

Coverage Option GPCD Calculate

Total Measured Water Savings (AF/Year)

Prior Activities Credit

Form Status: Not Submitted

Traditional	FlexTrack	Total	FlexTrack Target
0	0	0	52.07

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

CII Type of measure implemented

Measured water savings (AF/Year)

- **A) High-Efficiency Toilets.**
- **B) High-Efficiency Urinals (0.5 gpf)**
- **C) Ultra Low Volume Urinals(0.125 gpf)**
- **D) Zero Consumption Urinals (0.0 gpf)**
- **E) Commercial High - Efficiency Single Load Clothes Washers**
- **F) Cooling Tower Conductivity Controllers**

Back to Top

V4 - Latest

Reporting Year

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

⊞ F) Cooling Tower Conductivity Controllers

⊞ G) Cooling Tower pH Controllers

⊞ H) Connectionless Food Steamers

⊞ I) Medical Equipment Steam Sterilizers

⊞ J) Water - Efficient Ice Machines

⊞ K) Pressurized Water Brooms

⊞ L) Dry Vaccum Pumps.

Unique Conservation Measures

⊞ M) Industrial Process Water Use Reduction.

⊞ N) Commercial Laundry Retrofits.

⊞ O) Industrial Laundry Retrofits

⊞ P) Filter Upgrades (for pools,spas and fountains)

⊞ Q) Car Wash Reclamation Systems

⊞ R) Wet Cleaning.

⊞ S) Water Audits (To avoid double counting, do not include device/replacement water savings.)

⊞ T) Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

⊞ U) Waterless Wok

⊞ V) Alternative On-site Water Sources (For Rain Water Harvesting, commercial rain barrels are excluded. For Foundation Drain Water, exclude permeable paving.)

Back to Top

Reporting Unit:**El Toro Water District**
Signatory:**El Toro Water District**
RU Type:**Retail**

Welcome **Michael King** | Logout
Role:Data Entry User

Home | Annual Input Forms | Base Year Data | Reports | Reporting Unit

Reporting Year

< 2014 >

Water Sources and Usage
Potable Water Sources
Non Potable Water Sources
Potable Water Uses
Non Potable Water Uses
BMP 1
1.1 Retail Operations Practices
1.2 Retail Water Loss Control
1.3 Retail Metering with Commodity
1.4 Retail Conservation Pricing
BMP 2
2.1 Public Information Programs
2.2 School Education
BMP 3 - Residential
3 Traditional / FlexTrack
BMP 4 - CII
4 Traditional / FlexTrack
BMP 5 - Landscape
5 Traditional / FlexTrack
GPCD
GPCD

BMP 5 Landscape

Provisional Coverage Indication
Online Help

☐Form Complete

Save ALL

From the Coverage Option dropdown menu, select the track you want to use for coverage in this BMP. You can enter data for all tracks in this form. The data and water savings is saved for future use. Data and equations corresponding to the track you select here is used in this year's coverage report.

Coverage Option GPCD Calculate

Total Measured Water Savings (AF/Year)

Form Status: Not Submitted

Traditional	FlexTrack	Total	FlexTrack Target	Prior Activities
0	0	0	0	

You must enter all measured water savings manually entered in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

1) Accounts with Dedicated Irrigation Meters

Not On Track

Traditional

a)Number of dedicated irrigation meter accounts	
b)Number of dedicated irrigation meter accounts with water budgets	
c) Aggregate water use for all dedicated non-recreational landscape accounts with water budgets	
d)Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	
Aggregate acreage of recreational areas assigned water budgets for dedicated recreational landscape accounts with budgets	
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	Yes No N/A

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

Back to Top

V4 - **Latest**

< 2014 >

Water Sources and Usage

Potable Water Sources

Non Potable Water Sources

Potable Water Uses

Non Potable Water Uses

BMP 1

1.1 Retail Operations Practices

1.2 Retail Water Loss Control

1.3 Retail Metering with Commodity

1.4 Retail Conservation Pricing

BMP 2

2.1 Public Information Programs

2.2 School Education

BMP 3 - Residential

3 Traditional / FlexTrack

BMP 4 - CII

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

Browse...

Upload Clear

Technical Assistance

Traditional

e) Number of Accounts 20% over-budget

f) Number of accounts 20% over-budget offered technical assistance

g) Number of accounts 20% over-budget accepting technical assistance

If there are water savings in this measure, upload your backup data or the methodology spreadsheet that you have created.

Measured Water Savings (AF/Year)

Browse...

Upload Clear

2) Commercial/Industrial/Institutional(CII) Accounts Without Meters or with Mixed -Use Meters

On Track

Traditional

Number of mixed use and un-metered accounts

Number of irrigation water use surveys offered

Number of irrigation water use surveys accepted

Type: Incentives numbers received by customers — $Value 0

Type: Rebates numbers received by customers — $Value 0

Type: No- or Low-Interest loan offered numbers received by customers — $Value 0

Annual water savings by customers

Back to Top

Reporting Unit:**El Toro Water District**
Signatory:**El Toro Water District**
RU Type:**Retail**

Welcome **Michael King** | Logout
Role:Data Entry User

Home | Annual Input Forms | Base Year Data | Reports | Reporting Unit

Reporting Year

< 2014 >

Water Sources and Usage
Potable Water Sources
Non Potable Water Sources
Potable Water Uses
Non Potable Water Uses
BMP 1
1.1 Retail Operations Practices
1.2 Retail Water Loss Control
1.3 Retail Metering with Commodity
1.4 Retail Conservation Pricing
BMP 2
2.1 Public Information Programs
2.2 School Education
BMP 3 - Residential
3 Traditional / FlexTrack
BMP 4 - CII
4 Traditional / FlexTrack
BMP 5 - Landscape
5 Traditional / FlexTrack
GPCD
GPCD

GPCD Coverage Calculations

Provisional Coverage Indication
Online Help

Submitted to CUWCC
10/12/2015 11:09:43 AM

☑Form Complete

Calculate | Save

Instructions | Hints and Tips | Main Data | Population | Indirect Recycled Water | GPCD Matrix | Landscape Area Wateruse | Baseline CII | Targets (CUWCC MOU) | Targets (SBx7_7)

Would you like to use Weather Normalization (WN) adjustments? ◉ Yes ○ No

Do you accept the Council's default calculations? ◉ Yes ○ No

GPCD in 2006 ○	163.11	With WN	0	GPCD in 2014	174.81	With WN	0
Baseline GPCD (1997 to 2006) ◉	197.79	With WN	0	GPCD Target for 2018	162.2	With WN	0

Biennial GPCD Coverage Table

Year	Report	Target		Highest Acceptable Bound for WN option	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	190.7	100%	197.8
2011 [1]	2	94.6%	187.1	98.2%	194.2
2012	2	92.8%	183.5	96.4%	190.7
2013 [1]	3	91%	180	94.6%	187.1
2014	3	89.2%	176.4	92.8%	183.5
2015 [1]	4	87.4%	172.9	91%	180
2016	4	85.6%	169.3	89.2%	176.4
2017 [1]	5	83.8%	165.7	85.6%	169.3
2018	5	82.0%	187.1	82.0%	162.2

1 Interim odd year targets are shown for USBR Contractors

Potable Water GPCD for each Year in the Baseline Period

Year	GPCD	GPCD W. WN
2006	163.11	0
2005	195	0
2004	192.22	0
2003	208.02	0
2002	202.2	0
2001	213.35	0
2000	195.52	0
1999	214.95	0
1998	201.44	0
1997	192.1	0

Back to Top

V4 - **Latest**

BMP 4 - OTI

4 Traditional / FlexTrack

BMP 5 - Landscape

5 Traditional / FlexTrack

GPCD

GPCD

1998	201.44	0
1997	192.1	0

TARGETS/COMPLIANCE (SBx7-7)

Target Summary	2020	2015
Method 1	122.32	137.61
Method 2	122.32	
Method 3		
Method 4		
	Min Value	Max Value

Back to Top

Arcadis U.S., Inc.

445 South Figueroa Street

Suite 3650

Los Angeles, California 90071

Tel 213 486 9884

Fax 213 486 9894

www.arcadis.com