

**Urban**  
**WATER**  
**Management Plan**

December 15, 2005



**East Orange County Water District**

**2005**

**PSOMAS**

# URBAN WATER MANAGEMENT PLAN 2005



East Orange County Water District

*December 15, 2005*





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## **ACRONYMS and ABBREVIATIONS**

AB	Assembly Bill
ACT	Urban Water Management Planning Act of 1983
AF	Acre Feet
AFY	Acre Feet per Year
AMP	Allen McColloch Pipeline
AWPF	Advanced Water Purification Facilities
BEA	Basin Equity Assessment
BMP	Best Management Practices
BPP	Basin Pumping Percentage
CALFED	California-Federal
CALSIM	California Water Allocation and Reservoir Operations Model
CDR	Center for Demographic Research at California State University at Fullerton
CEQA	California Environmental Quality Act
CPTP	Coastal Pumping Transfer Program
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DBP	Disinfection Byproducts
DHS	Department of Health Services
DMM	Demand Management Measure
DWR	Department of Water Resources
EOC	Emergency Operations Center
EOCWD	East Orange County Water District
EOCF#2	East Orange County Feeder No. 2
ETO	Evapotranspiration
FY	Fiscal Year
GAP	Green Acres Project
GPCD	Gallons Per Capita Per Day
GPD	Gallons Per Day
GPM	Gallons Per Minute
GW	Groundwater
GWMP	Groundwater Management Plan
GWRS	Groundwater Replenishment System
IID	Imperial Irrigation District
IRP	Integrated Water Resources Plan
LRP	Local Resources Program
LTFP	Long Term Facilities Plan
MAF	Million Acre Feet
MARS	Metropolitan's Member Agency Radio System
MCL	Maximum Contaminant Level
MG	Million Gallons
MGD	Million Gallons per Day
MOU	Memorandum of Understanding
MPR	Master Plan Report
MTBE	Methyl Tertiary Butyl Ether
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County



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NDMA	N-nitrosodimethylamine
OC-33	MWD Orange County Turnout No. 33 off the AMP
OC-48	MWD Orange County Turnout No. 43 off the EOCF#2
OC-48	MWD Orange County Turnout No. 48 off the EOCF#2
OC-70	MWD Orange County Turnout No. 70 off Allen McColloch Pipeline
OCSD	Orange County Sanitation District
OCWA	Orange County Water Association
OCWD	Orange County Water District
OCWWD#8	Orange County Water Works District No. 8
OWDP	Ocean Water Desalination Plant
PEIR	Program Environmental Impact Report
PSI	Pounds Per Square Inch
QSA	Quantification Settlement Agreement
RA	Replenishment Assessment
RUWMP	Regional Urban Water Management Plan
RW	Recycled Water
RWQCB	Regional Water Quality Control Board
SAC	Santiago Aqueduct Commission
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SBVMWD	San Bernardino Valley Municipal Water District
SCAB	South Coast Air Basin
SCADA	Supervisory Control Data Acquisition System
SCCWRRS	Southern California Comprehensive Water Reclamation and Reuse Study
SDWA	Safe Drinking Water Act
SOCWRS	South Orange County Water Reliability Study
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	Thousand Acre Feet
TDS	Total Dissolved Solids
THM	Trihalomethanes
TIN	Total Inorganic Nitrogen
ULFT	Ultra Low Flush Toilet
USBR	U.S. Bureau of Reclamation
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
WARN	California Water Agency Response Network
WEROC	Water Emergency Response Organization of Orange County
WMP	Water Master Plan
WOC	Water Operations Center
WSDM	Water Surplus and Drought Management

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## **SECTION 1 INTRODUCTION**

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### **1.1 PURPOSE AND UWMP SUMMARY**

An Urban Water Management Plan (UWMP or Plan) prepared by a water purveyor is to ensure the appropriate level of reliability of water service sufficient to meet the needs of its various categories of customers during normal, single dry or multiple dry years. The California Water Management Planning Act of 1983 (Act), as amended, requires urban water suppliers to develop an UWMP every five years in the years ending in zero and five.

The legislature declared that the waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

East Orange County Water District's (EOCWD or District) 2005 UWMP has been prepared in compliance with the requirements of the Act, as amended to 2005<sup>1</sup> (Appendix A), and includes the following:

- Water District Service Area
- Water District Facilities
- Water Sources and Supplies
- Water Quality Information
- Water Reliability Planning
- Water Use Provisions
- Water Demand Management Measures
- Water Shortage Contingency Plan
- Water Recycling

The District was not required to prepare an UWMP in 2000 its wholesale water service and was exempt for its retail service based on legislation at that time. Recent legislation further defines an "urban water supplier" to include wholesale water agencies to comply with the Act. Therefore, in the interest of both its wholesale and retail customers the District has elected to prepare a combined UWMP for both its wholesale and retail agencies.

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<sup>1</sup>California Water Code, Division 6, Part 2.6; §10610, et. seq. Established by Assembly Bill 797 (1983).

## 1.2 URBAN WATER MANGEMENT PLAN PREPARATION

The 2005 UWMP requirements incorporate changes enacted by legislation, including Senate Bill (SB) 610 (2001), Assembly Bill (AB) 901 (2001), SB 672 (2001), SB 1348 (2002), SB 1384 (2002), SB 1518 (2002), AB 105 (2004), and SB 318 (2004). The UWMP also incorporates water use efficiency efforts that the District is considering implementing pursuant to the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU).<sup>2</sup> The District is a signatory to that MOU.

The sections in this Plan 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 system. The Department of Water Resources (DWR) *Review for Completeness Form* has been completed, which identifies the location of Act requirements in this Plan and is included in the Appendix B. Additionally, the DWR *Review for DMM* (Demand Management Measures) *Completeness Form* has also been completed and included in Appendix C, which complements Section 6 of this Plan.

### Plan Adoption

The 2005 UWMP was adopted by resolution of the EOCWD on December 15, 2005 following a public hearing. The UWMP was submitted to the California DWR, the California State Library, the County of Orange, EOCWD's sub-agencies, and other appropriate agencies, within 30 days of the District Board of Director's approval. Copies of the notice of public hearing (November 30, 2005 and December 7, 2005) and the Resolution of UWMP Adoption are included in Appendix D. Draft copies of the Plan were made available to the public within 30 days following Board approval.

### Agency Coordination

The EOCWD is both a wholesaler and retailer of water. Therefore, the UWMP is presented a combined plan and was prepared in coordination with the Municipal Water District of Orange County (MWDOC) for imported water, the Orange County Water District (OCWD) for groundwater, and EOCWD sub-agencies. The District's wholesale pipeline distribution system delivers water to five sub-agencies within its boundaries consisting of the Golden State Water Company, the City of Tustin, Orange Park Acres Mutual, the City of Orange and its own Retail Zone. All of the sub-agencies use groundwater with supplemental water supplied by EOCWD from the Allen McCulloch Pipeline or the East Orange County Feeder No. 2. The District is a member agency of MWDOC and OCWD, and the District's Retail system, as well as each of its other four wholesale sub-agencies, also relies upon groundwater from the Orange County Groundwater Basin.

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<sup>2</sup>The *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) was adopted in September 1991 by a large number of water suppliers, public advocacy organizations and other interested groups. It created the *California Urban Water Conservation Council* and established 16 Best Management Practices (BMPs) for urban water conservation, recently refined to 14 BMPs.

To assist EOCWD staff in preparation of the District's 2005 UWMP, EOCWD staff and/or consultants to the District for preparation of the UWMP attended the following workshops facilitated by DWR, Metropolitan and MWDOC:

**Metropolitan:** 2005 Regional UWMP Workshop at the City of Santa Ana, June 6, 2005, as well as additional regional meetings with Metropolitan.

**DWR:** 2005 UWMP Workshop at San Diego County Water Authority, February 1, 2005; and City of Santa Ana, March 1, 2005.

**MWDOC:** 2005 Regional UWMP at MWDOC, January 12, 2005.

This UWMP details the specifics as they relate to the District's water system and its service area and will refer to the Metropolitan Water District of Southern California (Metropolitan or MWD), MWDOC, OCWD and the Orange County Sanitation District (OCSD) throughout. Appendix E lists the numerous references used benefiting the development of this Plan.

The UWMP is intended to serve as a general, flexible, and open-ended document that periodically can be updated to reflect changes in the Orange County water supply trends, and conservation and water use efficiency policies. This Plan, along other EOCWD planning documents, will be used by EOCWD staff to guide the District's water use and management efforts through the year 2010, when the UWMP is required to be updated.

### **1.3 EAST ORANGE COUNTY WATER DISTRICT OVERVIEW**

The EOCWD, which encompasses an area of approximately 10,000 acres, operates as a wholesale and retail water supplier. The District was formed in December of 1961 to provide wholesale water to the areas within its boundaries. The District operates under the County Water District Law, which is contained in Division 12 of the California Water Code, Sections 30000 - 33901. EOCWD is an independent special district governed by a Board of Directors elected to four year terms by the voters within the District. The District is a member agency of MWDOC, which is a member agency of the Metropolitan. EOCWD is therefore entitled to receive imported water from the Colorado River Aqueduct and the State Project Water System purchased through MWDOC and delivered through MWD's water conveyance facilities.

In July of 1985, the District assumed the operations of the County of Orange Waterworks District No. 8 (OWWD#8), which until that time had been one of the District's sub-agencies (it should also be noted that OWWD#8 acquired the water system in 1951 from the El Modena Mutual Irrigation Company). Upon acquisition of this water system, it was named the EOCWD "Retail Zone" and the original District system was renamed the "EOCWD Wholesale Zone." Thus, EOCWD has been both a wholesale and retail water purveyor since 1985. A portion of the District's retail supply is pumped from the Orange County Groundwater Basin, administered by OCWD, while the balance of the Retail Zone water supply is furnished from the Wholesale Zone.

### 1.3.1 Wholesale

The District's Wholesale Zone includes imported water connections, storage, pumping, transmission and flow control facilities as well as metered connections to each of its five sub-agencies. Included among its assets are the following specific facilities:

- Two treated imported water connections to Metropolitan's East Orange County Feeder No. 2 (EOCF#2), which also originates the Robert B. Diemer Filtration Plant in Yorba Linda, California. These two connections are referred to by MWD as the "OC 43" and "OC-48" Turnouts
- One treated imported water connection to Metropolitan's Allen McColloch Pipeline (AMP), which also originates at Metropolitan's Robert B. Diemer Filtration Plant. This connection is referred to by Metropolitan as the "OC-70" Turnout
- A pump station at the OC-70 Turnout
- A flow-control facility located near the OC-48 Turnout
- Three storage facilities including a 6.0 million gallon (MG) trapezoidal reservoir with earth embankments, an 11.5 MG steel tank and a 1.0 MG Steel Tank
- Approximately 12 miles of transmission main varying in size from eight to 27-inch diameter including miscellaneous underground vaults and appurtenances
- Seventeen metered water connections to the aforementioned five sub-agencies
- An emergency interconnection with the City of Orange

In addition to these facilities, the District also owns capacity in the untreated Santiago Aqueduct, operated by the Santiago Aqueduct Commission (SAC). This facility delivers water from Lake Mathews in Riverside County, which was once treated at a now abandoned District-owned water treatment plant. A small portion of that treatment plant as well as a portion of the 6.0 MG is also owned by the Irvine Ranch Water (IRWD). IRWD also owns a portion of the conveyance facilities from the untreated SAC connection to the 6.0 MG Reservoir.

### 1.3.2 Retail

The District's Retail Zone consists of domestic water wells, storage reservoirs, pump stations, transmission and distribution pipelines, metered water connections and various administrative facilities. Included among its assets are the following specific facilities:

- Two adjacent domestic potable water wells including pumps and related equipment
- An on-site chlorine generator (at the wells)

- Three storage reservoirs including a 0.65 MG steel tank, a 0.1 MG concrete reservoir and a 1.5 MG capacity ownership in the Wholesale Zone's 11.5 MG Reservoir
- A hydro-pneumatic tank
- Three pump stations including one located at the 0.65 MG reservoir site; a second one located at the 0.1 MG reservoir site; and a third fire pump station that is activated during low flow conditions
- Approximately 24 miles of transmission and distribution piping varying in diameter from 2-inches to 16-inches including miscellaneous underground vaults and appurtenances
- Two connections to the EOCWD Wholesale Zone system
- An emergency connection to the City of Orange water system
- 1,192 domestic water meter connections to retail customers
- An administrative office building, warehouse, a single family residence (occupied by the District's Maintenance and Operations Superintendent) and a corporation yard, all located in the City of Orange

#### **1.4 WATER SERVICE AREA**

EOCWD provides wholesale water to an area of central Orange County, which encompasses the City of Tustin, a portion of the City of Orange and the adjoining unincorporated communities of North Tustin, East Tustin, Red Hill, Lemon Heights, Cowan Heights, Orange Park Acres and Panorama Heights. Generally speaking, most of the District lies east of the Costa Mesa (55) Freeway, north of the Santa Ana (5) Freeway, west of the Jamboree Road and south of Santiago Canyon Road.

##### **1.4.1 Climate Characteristics – Wholesale and Retail Service Areas**

The District's wholesale and retail service areas are located in a semi-arid environment with mild winters, warm summers and moderate rainfall, consistent with other areas of coastal Southern California. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or dry hot Santa Ana winds. The average annual temperature is 62.6 degrees Fahrenheit. Although the 2004/05 season has brought over 35 inches of rain, the long term average rainfall is 12.8 inches, occurring mostly between November and April. Evapotranspiration (ET<sub>o</sub>)<sup>3</sup> in the region averages 49.7 inches

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<sup>3</sup> Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity. ET from a standardized grass is commonly denoted as ET<sub>o</sub>.

annually. Specific month-by-month climatologic data is presented in Table 1.4-1 below:

**Table 1.4-1  
EOCWD Service Area Climate <sup>4</sup>**

<b>Month</b>	<b>Average ETo (inches)</b>	<b>Average Max Temp (°F)</b>	<b>Average Min Temp (°F)</b>	<b>Average Monthly Temp (°F)</b>	<b>Average Rainfall in Inches</b>
January	1.86	67.0	40.5	53.8	2.53
February	2.24	68.1	42.4	55.3	2.73
March	3.41	69.4	44.3	56.9	2.21
April	4.80	72.9	47.7	60.3	1.01
May	5.58	75.4	52.2	63.8	0.26
June	6.30	79.0	55.8	67.4	0.07
July	6.51	84.0	59.2	71.6	0.01
August	6.20	85.5	59.5	72.5	0.08
September	4.80	84.7	57.0	70.9	0.27
October	3.72	79.7	51.9	65.8	0.36
November	2.40	73.9	44.4	59.2	1.32
December	1.86	68.2	40.7	54.5	1.99
<b>Average or Total</b>	<b>49.7</b>	<b>75.6</b>	<b>49.6</b>	<b>62.6</b>	<b>12.82</b>

### **1.4.2 Wholesale Service Area**

#### ***Wholesale Service Area Location***

The EOCWD Wholesale Zone lies within the area described in Section 1.4 and is depicted graphically in Figure 1.1.

#### ***Wholesale Service Area Demographics***

As a non-municipal special district, EOCWD’s boundaries are not contiguous with those of the cities it serves, thereby making it difficult to obtain accurate demographic data specific to the District. However, through the interpolation of data obtained from the U.S. Census Bureau, the County of Orange Planning Department, the Orange County Registrar of Voters, and the Center for Demographic Research (CDR) at California State University at Fullerton, it is possible to approximate the District’s population.

As previously noted, EOCWD’s Wholesale Zone serves most of the City of Tustin, a portion of the City of Orange and unincorporated areas lying between these two cities. The CDR, which bases its findings on the U.S. Census data, projects 2005 populations of 77,475 for the City of Tustin and 138,289 for the City of Orange. It is estimated that approximately 80 percent of Tustin’s population and about 10 percent of Orange’s

<sup>4</sup> Temperatures and rainfall based on data from Tustin/Irvine Ranch Weather Station gathered from 12/1/1927 through 6/30/2003 as reported on the website [www.ocalmanac.com](http://www.ocalmanac.com)

population reside within EOCWD. This equates to 75,800. It is also estimated that about 15,000 additional people reside within the unincorporated areas of North Tustin, Cowan Heights, Lemons Heights, Panorama Heights and Orange Park Acres, all of which fall within EOCWD's boundaries. This yields an overall estimated population of approximately 90,800 for the entire District.

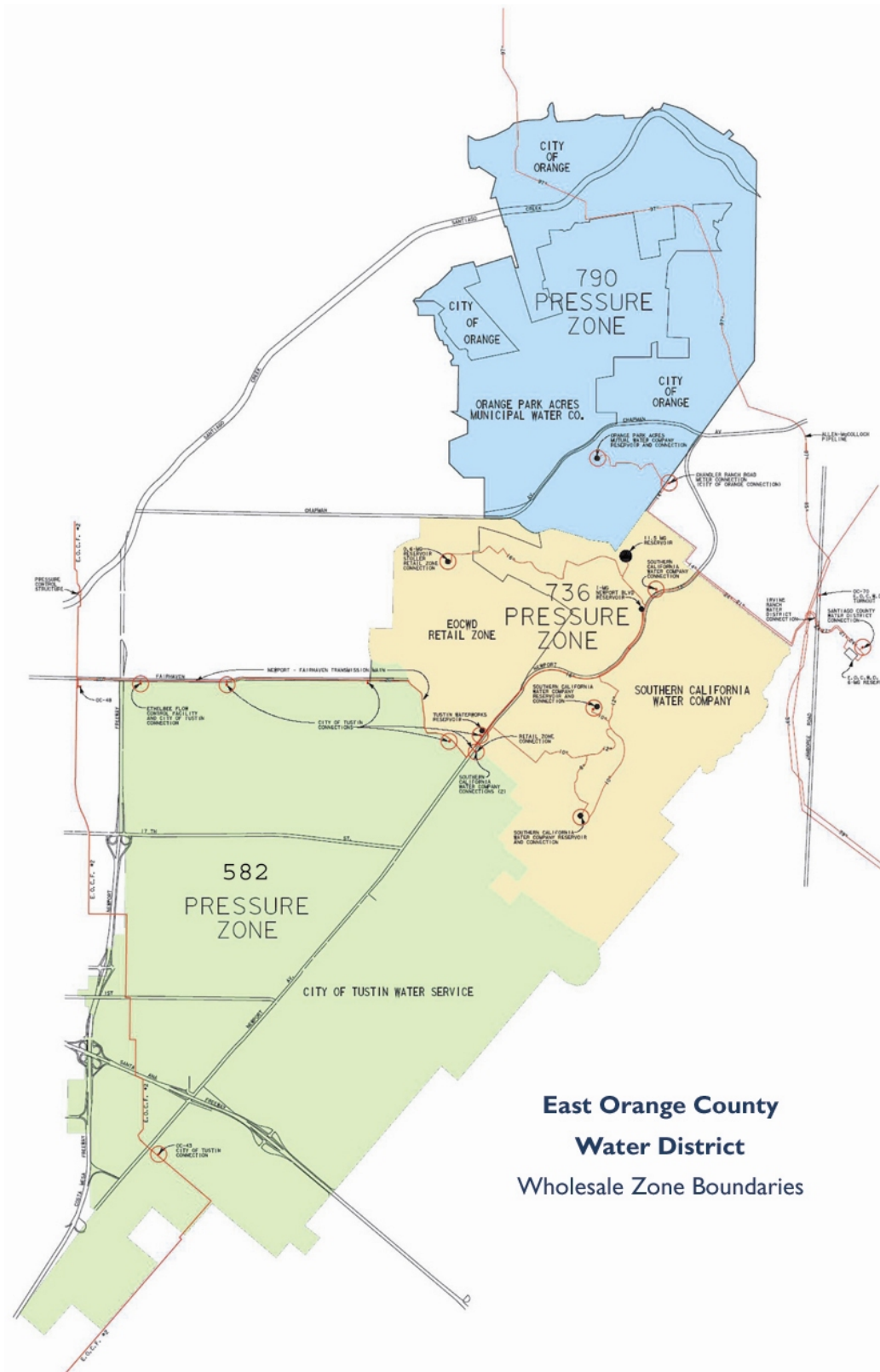
A further analysis based on an interpolation of Census data for the major Zip Code areas lying within EOCWD (92705, 92689 and 92780) also suggests a population of around 90,000.

As a third check, the Registrar of Voters show approximately 40,700 registered voters within EOCWD. There are also a significant number of area residents who are ineligible to vote, primarily due to being underage. Although the County Registrar of Voters was not able to provide any data on the number of area residents who are eligible to register to vote, but do not do so, statewide statistics<sup>5</sup> reflect a total California registration of 16.5 million out of a population of approximately 36 million, which includes approximately 14 million who are ineligible to register (primarily because they are under age 18). Thus statewide, only about 49 percent of the people residing in California are registered to vote. If we apply these same percentages to EOCWD (i.e., assuming 49% of the total population is registered to vote), that yields an area population of about 89,000 (based on 40,700 registered voters in the District).

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<sup>5</sup> California Voter Participation Survey ([www.calvoter.org](http://www.calvoter.org))





**Figure 1.1 Wholesale Service Area Boundary**

Thus, this additional demographic methodology also confirms the previously derived EOCWD Wholesale Zone population estimate of 90,000. Given that this same result has been obtained using several different methodologies, it appears to be a valid approximation and will therefore be used in the balance of this report.

The CDR also projects municipal population increases for all incorporated areas of Orange County. Those projections are summarized in Table 1.4-2. The tabular data suggests increases of 31.5 percent, 19.2 percent and 24.8 percent between 2000 and 2030 for the cities of Tustin and Orange and the County of Orange, respectively.

**Table 1.4-2  
Projected Population Using Base Year of 2000  
Percentage of Population Increase**

AREA	Percentage Population Increase Compared with Base Year of 2000 (Census Data) <sup>6</sup>					
	2005	2010	2015	2020	2025	2030
Tustin	14.8	22.2	27.2	30.7	31.5	31.5
Orange City	7.3	14.1	16.6	17.9	18.6	19.2
Orange County	8.7	15.6	19.6	22.4	24.2	24.8
Averages	10.2	17.3	21.1	23.7	24.8	25.2

Table 1.4-3 utilizes the information presented in Table 1.4-2 to estimate the population increase between 2005 and 2030. That data indicates average increases of 16.7 percent, 11.9 percent and 16.1 percent for the cities of Tustin and Orange, and the County of Orange, respectively.

**Table 1.4-3  
Projected Population Using Base Year of 2005<sup>7</sup>  
Percentage of Population Increase**

AREA	Percentage Population Increase Compared with Base Year of 2005 <sup>8</sup>				
	2010	2015	2020	2025	2030
Tustin	7.4	12.4	15.9	16.7	16.7
Orange City	6.8	9.3	10.6	11.3	11.9
Orange County	6.9	10.9	13.7	15.5	16.1
Averages	7.0	10.9	13.4	14.5	14.9

<sup>6</sup> Orange County and city data from Center for Demographic Research, California State University at Fullerton.

<sup>7</sup> Data extracted from Table 1.4-2

<sup>8</sup> Orange County and city data from Center for Demographic Research, California State University at Fullerton.

Although no specific data is available for the unincorporated areas of North Tustin, Cowan Heights, Lemons Heights, Panorama Heights and Orange Park Acres, the averages presented above are generally representative for the region. Thus, the overall average of 14.9 percent will be used in this report. Based on that determination, the overall population of East Orange County Water District will reflect increases as noted in Table 1.4-4.

**Table 1.4-4  
EOCWD Wholesale Service Area  
Projected Population Using Base Year of 2000**

	<b>Current and Projected Population of East Orange County Water District</b>					
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Population</b>	90,000	96,300	99,800	102,100	103,100	103,400

### **1.4.3 Retail Service Area**

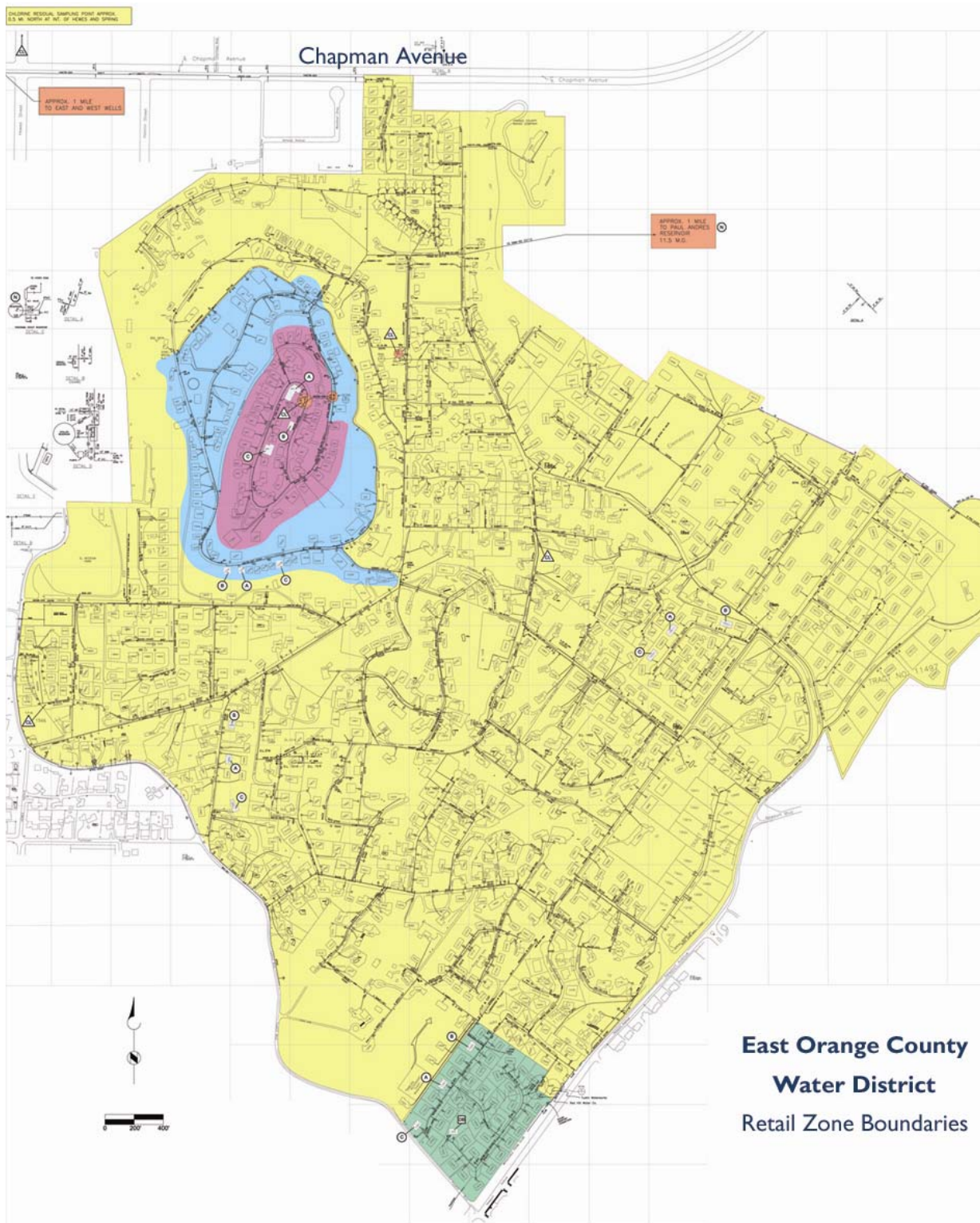
#### ***Retail Location***

The EOCWD Retail Zone system lies within the central portion of the Wholesale Zone about equidistant from the northern and southern boundaries and on the westerly side of the District. Most of the Retail Zone lies within the unincorporated community of Panorama Heights generally bounded on the west by Hewes Avenue, on the south by Foothill Boulevard, on the east by Newport Boulevard and Crawford Canyon Road and on the north by Chapman Avenue. The Retail Zone is depicted graphically in Figure 1.2.

#### ***Retail Service Area Demographics***

The Retail Service area has 1,192 service connections of which approximately 30 are duplexes, thus yielding a total of 1,210 single family dwelling units. There are no multiple family service connections in the Retail Service area.

The 2000 U.S. Census Tract 219.14 encompasses most of the Retail Service area, although some portions of this Tract are located outside of the service area. The 2000 census data found 960 owner occupied units with an average of 2.94 persons per dwelling unit. The same census data revealed 354 renter-occupied units with an average of 3.95 persons per dwelling unit. This yields an overall area average of 3.2 persons per dwelling unit. Based on that representative figure, the number of people residing in the 1,210 Retail Zone dwelling units can be reasonably estimated to be 3,872.



**Figure 1.2 Retail Service Area Boundary**

Although the District's Wholesale Zone service area will continue to grow in population, the Retail Service Area is mostly built-out with little room for new housing other than some in-fill of currently vacant lots. Over the past several years, about half a dozen new homes per year have been built in the Retail Zone. Sufficient lots still remain for this trend to continue for several years. Assuming the trend does continue, it will result in an overall population increase of about 12 percent by the year 2030. Population data based on this continuing trend is summarized in Table 1.4-5.

**Table 1.4-5**  
**EOCWD Retail Service Area**  
**Population – Current and Projected**

	2005	2010	2015	2020	2025	2030
<b>EOCWD Retail Service Area Population</b>	3,872	3,970	4,060	4,150	4,250	4,350

## **SECTION 2 WATER SOURCES AND SUPPLIES**

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### **2.1 WATER SOURCES**

As previously noted, the EOCWD Wholesale Zone receives imported water from the Metropolitan's AMP and EOCWD#2 Pipelines, which is purchased through MWDOC. EOCWD's Retail Zone purchases a portion of its supply from the District's Wholesale Zone and pumps the balance from the groundwater aquifer. Brief descriptions of Metropolitan, MWDOC, OCWD and OCSD are included below.

#### ***Metropolitan Water District of Southern California (Metropolitan)***

Metropolitan was formed in the late 1920's. At that time, Orange County was mostly an agriculturally-based economy with the cities of Santa Ana, Anaheim, and Fullerton as the primary centers of urban development. Although other cities and residential communities existed at that time, it was these three cities that joined ten others located in Southern California, to form Metropolitan in 1928. Collectively, these charter members recognized the limited water supplies available within the region, and realized that continued prosperity and economic development of Southern California depended upon the acquisition and careful management of an adequate supplemental water supply. This foresight made the continued development of southern California and Orange County possible. Metropolitan acquires water from northern California via the State Water Project and from the Colorado River to supply water to most of southern California. As a wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its member agencies. One such member agency is MWDOC.

#### ***Municipal Water District of Orange County (MWDOC)***

In 1951, MWDOC was formed to provide supplemental water to many purveyors within Orange County who were not Metropolitan member agencies. The communities surrounding the Lower Santa Ana Groundwater Basin realized that the local underground supply might not be sufficient to meet future demands of the area.

MWDOC was formed for the purpose of contracting with Metropolitan to acquire supplemental import water supplies from northern California and the Colorado River for use within the Orange County area. MWDOC is Metropolitan's second largest wholesale member agency. MWDOC represents 30 member agencies, including 14 special districts, 14 city water departments, one private water company and one mutual water company. MWDOC provides imported water to all of Orange County except for the cities of Anaheim, Fullerton and Santa Ana.<sup>9</sup> It is through MWDOC that the District purchases imported water from Metropolitan.

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<sup>9</sup> MWDOC Draft 2005 Regional Urban Water Management Plan, Section 1.

### **Orange County Water District (OCWD)**

In 1933, OCWD was formed by legislative act to protect and manage the County's vast, natural, underground water supply with the best available technology and to defend its water rights to the Santa Ana River Basin. As part of its original formation, OCWD was established by a special act (Act), of the State of California Legislature. This legislation is found in the State of California Statutes, Water – Uncodified Acts, Act 5683, as amended.<sup>10</sup> The basin is managed by OCWD under the Act, which functions as a statutorily-imposed physical solution. Section 77 of the Act states that, *'nothing in this act contained shall be so construed as to affect or impair the vested right of any person, association or corporation to the use of water.'*<sup>11</sup> According to the Act, the District has the right to construct and operate groundwater-producing facilities in the basin. The Act also empowers OCWD to impose replenishment assessments and basin equity assessments on production and to require registration of water-producing facilities and the filing of certain reports; however, OCWD is expressly prohibited from limiting extraction unless a producer agrees.<sup>12</sup>

The basin is managed by OCWD for the benefit of municipal, agricultural and private groundwater producers. OCWD has 23 major producers extracting water from the Orange County groundwater basin (basin) serving a population of approximately 2.8 million.<sup>13</sup> Carefully managed by OCWD in collaboration with the other water and wastewater agencies, the growing population can be assured of a secure water supply from the groundwater source. Processes such as groundwater recharge of the Santa Ana River, recycling of wastewater, conservation and water use efficiency, and creative water purchases have aided in replenishing the groundwater basin to desired levels to meet required demands.

### **Orange County Sanitation District (OCS D)**

Wastewater from the District's service area is collected and treated by OCS D. OCS D manages wastewater collection and treatment for approximately 471 square miles in central and northwest Orange County, which includes 21 cities, 3 special districts, and 2.4 million residents.<sup>14</sup> OCS D utilizes the following two facilities: Reclamation Plant No. 1 in Fountain Valley and Treatment Plant No. 2 in Huntington Beach to treat a combined daily average of 238 million gallons of wastewater. Effluent from Reclamation Plant No. 1 is either routed to the ocean disposal system or is sent to the OCWD facility, Green Acres Project, for advanced treatment and recycling. The Green Acres Project supplies recycled water to several cities in central Orange County and offsets regional demands for potable water supplies.

<sup>10</sup> Orange County Water District Act.

<sup>11</sup> Orange County Water District Act, Section 77.

<sup>12</sup> Orange County Water District Act, Sections 23 and 31.5.

<sup>13</sup> Orange County Facts and Figures. Center for Demographic Research. Available: <http://www.fullerton.edu/cdr/countyfacts.pdf>.

<sup>14</sup> Orange County Water District Facts and Key Statistics. [www.ocsd.com](http://www.ocsd.com). January 2005

**2.1.1 Wholesale**

The EOCWD Wholesale Zone supplies imported water to its four sub-agencies and its Retail Zone. The Wholesale Zone owns capacity in three Metropolitan imported water connections and one untreated (and currently inactive) SAC water connection. Information on these four connections is presented in Tables 2.1.1-1 and 2.1.1-2.

**Table 2.1.1-1  
 Wholesale Zone – Imported Treated Water Connections**

<b>Designation</b>	<b>Location</b>	<b>Capacity</b>
OC-70	West of Jamboree Road and east of Peter's Canyon Reservoir; turnout on the AMP	9.57 cubic feet per second (cfs) (4,295 gpm)
OC-48	East side of Tustin Avenue just south of Fairhaven Avenue; turnout from the EOCF#2	A total of 16.0 cfs is shared between OC-48 and OC-43 (5,386 gpm)
OC-43	In Walnut Street east of Newport Boulevard in the City of Tustin.	A total of 16.0 cfs is shared between OC-48 and OC-43 (5,386 gpm)
<b>Total Treated Water Capacity</b>		25.57 cfs / 11,475 gpm

As previously noted, the District also owns capacity in an untreated water connection to the Santiago Aqueduct which delivers water from Lake Mathews in Riverside County. Prior to February 1997, this water was treated at a now abandoned EOCWD treatment plant located adjacent to the District's 6.0 MG Reservoir. Although this water is not currently usable in the District's potable water system, it is referenced in this report as a possible source of supply in the event treatment is provided at some future date.

**Table 2.1.1-2  
 Wholesale Zone – Imported Untreated Water Connection**

<b>Designation</b>	<b>Location</b>	<b>Capacity</b>
OC-33	West of Jamboree Road and east of Peter's Canyon Reservoir; turnout on the SAC	10.0 cubic feet per second (cfs) (4,488 gpm)
<b>Total Untreated Water Capacity</b>		10.0 cfs / 4,488 gpm



**2.1.2 Retail**

The District’s Retail Zone has two sources of water supply:

1. Imported Water: Metropolitan imported water through MWDOC and supplied by the Wholesale Zone; and
2. Groundwater: Orange County Groundwater Basin water managed by OCWD.

These sources of supply are summarized in Tables 2.1.2-1 and 2.1.2-2.

**Table 2.1.2-1  
Retail Zone – Imported Water Connections**

Designation	Location	Capacity
11.5 MG Andres Reservoir	East of Newport Boulevard and south of Canyon View Avenue	The WZ provides water to all of its sub-agencies including the RZ on an as-available basis with no guaranteed allotment.
Newport Boulevard Connection	On the east side of Newport Boulevard north of Old Foothill Boulevard; this connection only activates during periods of very low system pressures	The WZ provides water to all of its sub-agencies including the RZ on an as-available basis with no guaranteed allotment
<b>Total Untreated Water Capacity</b>		See above

**Table 2.1.2-2  
Retail Zone – Groundwater Sources**

Designation	Location	Capacity
East Well	185 North McPherson Road in the City of Orange	Well production capacity is regulated on an annual basis by OCWD and varies from year-to-year
West Well	185 North McPherson Road in the City of Orange	See above
<b>Total Untreated Water Capacity</b>		See above

Table 2.1.2-3 presents historic Retail Zone groundwater pumping rate information for the years 2000 through 2005 (fiscal years beginning July 1<sup>st</sup> and ending June 30<sup>th</sup> of the following (and noted) year). In reviewing the information, a notable production anomaly

can be seen in the years 2003 and 2004. This anomaly was caused by bacteriologic contamination problems which caused the District to take both of its wells out of service for most of the period between March 2003 and February 2004. The bacteriological problem has since been resolved and both wells have been returned to full service and have not experienced any further water quality problems.

**Table 2.1.2-3  
Retail Zone – Groundwater Pumped In Past Five Years  
(AFY)**

<b>Basin Name / Well</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Orange County Groundwater Basin – EOCWD East Well	743.5	579.8	147.7	281.6	329.5
Orange County Groundwater Basin – EOCWD West Well	51.7	127.6	63.6	35.1	312.4
<b>Subtotal (Groundwater)</b>	<b>795.2</b>	<b>707.4</b>	<b>211.3</b>	<b>316.7</b>	<b>641.9</b>
Imported Water	300.8	465.8	905.5	873.1	428.2
<b>Total Groundwater + Import</b>	<b>1,096.0</b>	<b>1,173.2</b>	<b>1,116.8</b>	<b>1,189.8</b>	<b>1,070.1</b>
% Groundwater of Total Water Supply	72.6%	60.2%	18.9%	26.6%	60.0%

## 2.2 WATER SUPPLIES

### 2.2.1 Wholesale

#### Imported Water

As noted earlier in Table 2.1.1-1, EOCWD owns a total capacity of 25.57 cfs (9,681 gpm) which can be delivered from three connections to two different Metropolitan pipelines (OC-70 on the AMP and OC-43 and OC-48 on the EOCF#2). Although both pipelines are owned and operated by Metropolitan, water purchases are administered through MWDOC, the Metropolitan member agency.

The figures presented in Table 2.2.1-1 represent actual sales to other agencies for 2000 and 2005 for the 12-month period ending June 30<sup>th</sup>. The balance of the entries are based on the projections made by the individual agencies as reported by MWDOC and adjusted for the projected increases in demand as presented in Section 4, Table 4.2.1-4.

**Table 2.2.1-1  
East Orange County Water District  
Wholesale Zone Sales to Other Agencies  
Historic and Projected  
(AFY)**

<b>EOCWD Member Agency</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
EOCWD Retail <sup>[1]</sup>	433.8	383.8	290	300	300	300	310
City of Orange	71.7	711.5	360	370	380	380	380
City of Tustin <sup>[2]</sup>	5,314.8	7,756.6	2,400	2,450	2,480	2,490	2,490
Orange Park Acres Mutual	541.5	288.7	300	310	310	320	320
Golden State Water Company <sup>[3]</sup>	1,547.4	1,374.5	1,500	1,530	1,550	1,560	1,560
<b>Total</b>	<b>7,909.2</b>	<b>10,515.1</b>	<b>4,850</b>	<b>4,960</b>	<b>5,020</b>	<b>5,050</b>	<b>5,060</b>

<sup>[1]</sup> Includes only imported water sales and projected sales from the Wholesale System; does not include Retail System groundwater production.

<sup>[2]</sup> City of Tustin sales for 2000 and 2005 includes purchase of 2,583 AF and 4,227 AF on In-lieu water, respectively; projections for future years do not include in-lieu water because such water cannot be guaranteed and can therefore not be considered part of the available supply. Tustin projections also assume installation and operation of three new wells by 2010 and a fourth well by 2015. Once placed into operation, Tustin's imported water purchases from EOCWD should decrease.

<sup>[3]</sup> Formerly Southern California Water Company

In the case of Tustin, the significant reductions assume the City will greatly reduce its historic level of water purchases from EOCWD and instead rely on increased groundwater productions from its own wells. It should also be noted that in-lieu purchases are not included in the projected figures, but are included in the 2000 and 2005 figures (i.e., surplus water placed on sale by Metropolitan, which is imported in lieu of pumping groundwater). In-lieu water is not included in future projections because it cannot be guaranteed and therefore cannot be considered part of the available water supply. In 2000 and 2005, the City of Tustin purchased a total of 2,582.6 AF and 4,226.7 AF, respectively, of in-lieu water which is included in the totals cited in Table 2.2.1-1. That amount is reflected in a similar reduction in groundwater pumping by the City of Tustin (but not by EOCWD).

## 2.2.2 Retail

### Imported Water

In a normal year, EOCWD's Retail Zone attempts to maximize the use of its most cost-effective source of supply, i.e., groundwater. The exact percentage and volume of groundwater pumped varies from year-to-year depending on the Basin Production Percentage set by OCWD; however, in a normal year it generally is in the 60-70 percent range. Once the maximum amount of groundwater has been pumped, all other demands are met through imported water purchases from the Wholesale Zone. In a typical year, 100 percent of the imported water purchased is delivered through the Retail Zone's connection near the 11.5 MG reservoir.

### Groundwater

#### *Orange County Groundwater Basin*

The Orange County groundwater basin underlies the north half of Orange County beneath broad lowlands. The basin covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, the Pacific Ocean to the southwest, and terminates at the Orange County line to the northwest, where its aquifer systems continue into the Central Basin of Los Angeles County. The aquifers comprising the Orange County groundwater basin extend over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits.

Groundwater supply currently meets approximately 66 percent of the water supply demand for all of Orange County that overlies the Orange County Groundwater Basin. This amount is adjusted annually based on groundwater basin hydrologic conditions.

During the water year July 2003 to June 2004, total basin production for all agencies was approximately 284,621 AF.<sup>15</sup> The groundwater basin generally operates as a reservoir in which the net amount of water stored is increased in wet years to allow for managed overdrafts in dry years. The basin is recharged primarily from local rainfall (greater in wet years), base flow from the Santa Ana River (much of which is actually recycled wastewater from treatment plants in Riverside and San Bernardino Counties), imported water percolated into the basin, and recycled wastewater directly recharged into the basin. The production capability of the basin is being increased as a result of a variety of specific management initiatives including increased wastewater reclamation and the blending of lower quality water with potable water for public distribution.

The Orange County groundwater basin is not adjudicated and based on the Department of Water Resources' official departmental bulletins, California's Groundwater Bulletin 118 Updated 2003 and Bulletin 160, The California Water Plan Update 2005, the Orange

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<sup>15</sup>Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2004

County groundwater basin is not specifically identified as a basin in an overdraft condition. The California Water Plan Update, however, does state that groundwater overdraft is a challenge for the South Coast Hydrologic Region, which includes the Orange County groundwater basin. The Orange County groundwater basin is considered in an overdraft condition by OCWD; however, the groundwater levels and amount of overdraft fluctuate over time. OCWD continually monitors groundwater level trends and has collected data since 1962. OCWD's 2004 Groundwater Management Plan summarizes the accumulated overdraft and water level elevations within the basin. OCWD estimates that the accumulated overdraft in June 2003 was approximately 400,000 AF.<sup>16</sup>

Based on OCWD's 2004 Groundwater Management Plan the target accumulated overdraft is 200,000 AF. An accumulated overdraft condition minimizes the localized high groundwater levels and increases ability to recharge storm events from the Santa Ana River. OCWD estimates that the groundwater basin can safely be operated on a short-term emergency basis with a maximum accumulated overdraft of approximately 500,000 AF; however, 400,000 AF is preferred. With an accumulated overdraft of 200,000 AF, the basin is considered 99.5 percent full with 40 million acre feet (MAF) of groundwater in storage.

In an effort to eliminate long-term overdraft conditions, OCWD developed a comprehensive computer-based groundwater flow model to study and better understand the basin's reaction to pumping and recharge. OCWD has also implemented a monitoring program to track dynamic conditions including groundwater production, storage, elevations, and quality. Components of this monitoring program includes the request for the District to provide its groundwater production to OCWD on a monthly basis, yearly measurement of groundwater levels, water quality monitoring, and prevention of sea water intrusion.

### ***Basin Pumping Percentage***

One of the methods, OCWD uses to manage the amount of production from the Orange County groundwater basin is the establishment of a Basin Production Percentage (BPP). OCWD recommends a BPP each water year which is calculated by dividing a producer's groundwater production by their total potable water demands. The BPP is based on groundwater conditions, availability of imported water supplies, and basin management objectives. The BPP is also a major factor in determining the cost of groundwater production from the basin for that year.

While the BPP has been as high as 75 percent in recent years, the BPP was set at 66 percent for 2004-2005. The BPP has been set at 64 percent for the water year 2005-2006 and is anticipated to increase to 70 percent over the next five years. Producers may pump above the BPP to 100 percent of their needs, if basin conditions allow, by paying the Basin Equity Assessment (BEA). The BEA is the additional fee paid on any water

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<sup>16</sup>Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2004

pumped above the BPP, making the cost of that water equal to the cost of imported water. Such flexibility in producing over the BPP ensures the District and other water utilities in Orange County the ability to provide water to their customers during periods of varying water availability.

Additionally, when Metropolitan has an abundance of water, they may choose to activate their In-Lieu Program, where imported water is purchased in-lieu of pumping groundwater. This allows each agency to pump above the BPP without the penalty of the BEA. This is a special program by OCWD, MWDOC and Metropolitan.

**Recharge Facilities**

Another method for controlling overdraft is through recharge management programs. The basin is recharged by multiple sources including natural and artificial sources. Natural recharge occurs when groundwater producers use surface water in-lieu of groundwater. The reduction in pumping naturally recharges the basin. Another source of natural recharge is the result of precipitation and OCWD estimates that approximately 60,000 AFY recharged to the basin.

Artificial recharge occurs through developed percolation ponds (approximately 1,000 acres) and also via injection through the Talbert and Alamitos Barriers. The four groundwater spreading systems throughout OCWD’s service area and their respectable percolations rates are summarized in Table 2.2.2-1.

**Table 2.2.2-1  
Orange County Groundwater Basin  
Groundwater Spreading Systems**

<b>System</b>	<b>Area (acres)</b>	<b>Storage Capacity (AF)</b>	<b>Percolation Rate (cfs)</b>
Main River System	245	480	87-115
Off-River System	126	394	15-40
Deep Basin System	280	8,484	89-300
Burris Pit/Santiago System	373	17,500	106-210

These percolation systems can recharge Santa Ana River baseflow and storm flows. OCWD estimates that approximately 155,000 AF of baseflow and 60,000 AF of storm flows are recharged each year on average. OCWD also imports between 35,000 AF and 60,000 AF of replenishment water to be used for recharging the basin.

OCWD also recharges the basin by injecting water to prevent seawater intrusion. The seawater intrusion barriers include the Talbert and Alamitos Barriers. The Talbert Barrier has 26 injection wells and injects 12 mgd into the groundwater basin. Over 95 percent of

the water injected flows inland and is therefore considered replenishment water. The Alamitos Barrier injects approximately 5,000 AFY of which 50 percent stays within the basin for replenishment.

The estimated average annual recharge of the basin based on the information provided above is 328,400 AF to 353,400 AF. The range is due to the amount of imported water purchased from Metropolitan each year. The amount of water available for recharge will vary from year to year.

***EOCWD Retail Zone Wells***

As previously noted, EOCWD typically maximizes its use of groundwater pumped at its two wells (East and West Wells). Tables 2.2.2-2 and 2.2.2-3 present information on the to Retail Zone wells.

**Table 2.2.2-2  
EOCWD Active Wells**

Well No.	Well Location	Year of Construction	Depth (feet)	Capacity (gpm)	2003/04 Production (AF)
East Well	185 North McPherson Road, Orange, CA	1947	504	1,000	281.6
West Well	185 North McPherson Road, Orange, CA	1926	800	500	35.1 <sup>[1]</sup>

<sup>[1]</sup> The West Well was out of service for the majority of 2003/04.

**Table 2.2.2-3  
EOCWD Active Wells  
Projected Amount of Pumping (AFY)**

Well No.	2005*	2010	2015	2020	2025	2030
East Well	330	500	510	520	530	540
West Well	312	320	320	320	320	320
<b>Total</b>	<b>642</b>	<b>820</b>	<b>830</b>	<b>840</b>	<b>850</b>	<b>860</b>

\* Actual values for 2005; all other values are projected.

## **SECTION 3 WATER QUALITY**

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### **3.1 WATER QUALITY OF EXISTING SOURCES**

As required by the Safe Drinking Water Act, which was reauthorized in 1996, EOCWD provides annual Water Quality Reports to its customers; also known as Consumer Confidence Reports. This mandate is governed by the Environmental Protection Agency (EPA) and the California Department of Health Services (DHS) to ensure the safety of potable water.

#### **IMPORTED WATER**

The District receives imported water through MWDOC from Metropolitan, which receives raw water from northern California through the SWP and the Colorado River Aqueduct. Metropolitan water is treated in accordance with potable standards at filtration plants located throughout Southern California. EOCWD receives its treated imported water from the Robert B. Diemer Filtration Plant located in Yorba Linda, California.

Metropolitan tests and treats its water for microbial, organic, inorganic, and radioactive contaminants as well as pesticides and herbicides. Protection of Metropolitan's water system continues to be a top priority. In coordination with its 26 member public agencies, Metropolitan added new security measures in 2001 and continues to upgrade and refine procedures. Changes have included an increase in the number of water quality tests conducted each year (more than 300,000) as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.<sup>17</sup> Metropolitan also has one of the most advanced laboratories in the county where water quality staff performs tests, collects data, reviews results, prepares reports, and researches other treatment technologies. Although not required, Metropolitan monitors and samples elements that are not regulated but have captured scientific and/or public interest. Metropolitan has tested for chemicals such as perchlorate, arsenic, methyl tertiary butyl ether (MTBE), and chromium VI among others.

In Metropolitan's Integrated Resources Plan (IRP) Update, water quality was identified as a possible risk to Metropolitan's future water supply reliability. Existing supplies could be threatened in the future because of contamination, more stringent water quality regulations, or the discovery of an unknown contaminant. Water quality of imported water could directly impact the amount of water supplies available to the District. Metropolitan's 2005 UWMP Update includes the following examples:

- If a groundwater basin becomes contaminated and cannot be used, more water will be required from other sources.

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<sup>17</sup> Metropolitan's website,  
[www.mwdh2o.com/mwdh2o/pages/yourwater/2005\\_report/protect\\_02.html](http://www.mwdh2o.com/mwdh2o/pages/yourwater/2005_report/protect_02.html)



- Imported water from the Colorado River must be blended (mixed) with lower salinity water from the SWP. Higher salinity levels in the Colorado River would increase the proportion of SWP supplies required.
- High total dissolved solids (TDS) in water supplies leads to high TDS in wastewater, which increases the cost of recycled water.
- If diminished water quality causes a need for membrane treatment, the process typically results in losses of up to 15 percent of the water processed.
- Degradation of imported water supply quality could limit the use of local groundwater basins for storage.
- Changes in drinking water quality standards such as arsenic, radon, or perchlorate could increase demand on imported water supplies.

Because of the concerns identified above, Metropolitan has identified those water quality issues that are most concerning and have identified necessary water management strategies to minimize the impact on water supplies. Water quality concerns with Metropolitan's water supplies and the approaches taken to ensure acceptable water quality are discussed in the following sections.

### **Salinity**

Water from the Colorado River Aqueduct has the highest level of salinity of all Metropolitan's sources of supply, averaging 650 mg/L during normal water years.<sup>18</sup> Several actions have been taken on the state and federal level to control the salinity with the river such as the Colorado River Basin Salinity Control Act in 1974 and formation of the Colorado River Basin Salinity Control Forum. In 1975, water quality standards and a plan for controlling salinity were approved by the Environmental Protection Agency.

In contrast, water from the SWP is significantly lower in total dissolved solids, averaging 250 mg/L. Because of the lower salinity, Metropolitan blends SWP water with Colorado River water to reduce the salinity in the water delivered to its customers. The Metropolitan's board has adopted a salinity objective of 500 mg/L for blended imported water as defined in Metropolitan's Salinity Management Action Plan. Metropolitan estimates that the objective can be met in seven out of ten years. In the other three years, hydrologic conditions would result in increased salinity and reduced volume of SWP supplies.

In an effort to address the concerns over salinity, Metropolitan secured Proposition 13 funding for two water quality programs:

- 1) Water Quality Exchange Partnership – the funding is being used to develop new infrastructure to optimize water management capabilities between the agricultural users of the eastern San Joaquin Valley and urban users of southern California.

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<sup>18</sup> Metropolitan Water District of Southern California, Regional Urban Water Management Plan, September 2005 Draft

Installing infrastructure will provide opportunities for Metropolitan to exchange SWP water for higher quality water.

- 2) The Desalination Research and Innovation Partnership – the funding is being used to develop cost-effective advanced water treatment technologies for the desalination of Colorado River water, brackish groundwater, municipal wastewater, and agricultural drainage water.

### ***Perchlorate in Colorado River***

Perchlorate is a contaminant of concern and is known to have adverse effects on the thyroid. Perchlorate has been detected at low levels in the Colorado River water supply. Perchlorate is difficult to remove from water supplies with conventional water treatment. Successful treatment technologies include nanofiltration, reverse osmosis, biological treatment, and fluidized bed bioreactor treatment. Metropolitan continues to monitor perchlorate contamination of the Colorado River as well as research various treatment options. In 2002, Metropolitan adopted a Perchlorate Action Plan which defined the following nine objectives:

- 1) expand monitoring and reporting programs
- 2) assess the impact of perchlorate on local groundwater supplies
- 3) continue tracking health effects studies
- 4) continue tracking remediation efforts in the Las Vegas Wash
- 5) initiate modeling of perchlorate levels in the Colorado River
- 6) investigate the need for additional resource management strategies
- 7) pursue legislative and regulatory options for cleanup activities and regulatory standards
- 8) include information on perchlorate into outreach activities
- 9) provide periodic updates to Metropolitan's board and member agencies

### ***Disinfection by-products formed by disinfectants reacting with bromide and total organic carbon in SWP water***

SWP water supplies contain levels of total organic carbon and bromide that are a concern to Metropolitan to maintain safe drinking water supplies. When water is disinfected at treatment plants certain chemical reactions can occur with these impurities that can form Disinfection Byproducts (DBP). DBPs in turn can result in the formation of Trihalomethanes (THMs). THMs have been found to cause cancer in laboratory animals. Inherent in any through-Delta water movement is the high organic and bromide loading imposed on the water from agricultural runoff and salt water intrusion. This poses significant treatment challenges to the receiving end users, like Metropolitan, to avoid problems with DBPs and the formation of THMs. It is imperative that the quality of SWP water delivered to Metropolitan be maintained at the highest levels possible.

In order to control the total organic carbon and bromide concentrations in Metropolitan's water supply, SWP water is blended with Colorado River water. The blending of the two water sources benefits in two ways: reduction in disinfection byproducts and reduction in salinity (as discussed earlier). Because of the recent drought conditions on the Colorado

River, water supplies have been reduced which impacts the blending operations at the various filtration plants. As a result, Metropolitan's Board of Directors authorized the use of ozone as the primary disinfectant at all five Metropolitan treatment plants in July 2003. Previously, only the two plants that treated 100 percent SWP water had been approved for this treatment. These two plants were chosen for the use of ozone in order to meet new disinfection byproducts regulations. Metropolitan's Board plans to install ozonation at the remaining three plants by 2009, including the Diemer filtration plant.

### ***Methyl Tertiary Butyl Ether (MTBE) in groundwater and local surface reservoirs***

The California Department of Health Services (DHS) has adopted a primary maximum contaminant level (MCL) of 13 ug/L for MTBE. MTBE is an oxygenate found in gasoline. Metropolitan monitors MTBE levels at Diamond Valley Lake and Lake Skinner. The reservoirs also have boat requirements such as MTBE-free fuel to aid in the protection of imported water supplies. MTBE concentrations have been below the MCL.

### ***Uranium***

Uranium is a contaminant of concern in the water from the Colorado River. There are uranium mine tailings located approximately 600 feet from the river. Rainfall seeps through the tailings and contaminates the local groundwater which flows to the river. In 2003, an interim action system was implemented that intercepts some of the contaminated groundwater prior to reaching the river. The Department of Energy is preparing an Environmental Impact Statement that will evaluate the possibility of moving the pile, capping it in place, and other alternatives. Uranium levels at Metropolitan's intake range from 1 to 5 pCi/L whereas the California drinking water stand is 20 pCi/L.<sup>19</sup>

### ***N-nitrosodimethylamine (NDMA)***

NDMA is an emerging contaminant that may have an impact on the water supply. Although Metropolitan's water supplies are non-detect for NDMA, there is a concern that chlorine and monochloramine can react with organic nitrogen precursors to form NDMA.

### ***Hexavalent Chromium (Chromium VI)***

Currently the MCL for total chromium is 0.05 mg/L, which includes Chromium VI. California DHS is to set a MCL for Chromium VI, however, the Office of Health Hazard Assessment must first establish a public health goal. Metropolitan samples for Chromium VI and monitors levels within the Colorado River because of Chromium VI detection in groundwater near the river. Metropolitan is involved in a Technical Work Group that reviews monitoring results and remediation plans for groundwater contaminated with Chromium VI at a site located adjacent to the Colorado River near Topock, Arizona. In February 2005, Chromium VI was detected at a concentration of 354

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<sup>19</sup> Metropolitan Water District of Southern California, Regional Urban Water Management Plan, September 2005 Draft

parts per billion (ug/L).<sup>20</sup> Metropolitan is involved in a Technical Work Group that reviews monitoring results and remediation plans for contaminated groundwater.

### **Water Quality Programs**

Metropolitan supports and is involved in many programs that address water quality concerns related to both the SWP and Colorado River supplies. Some of the programs and activities include:

- CALFED Program – This program coordinates several SWP water feasibility studies and projects. These include:
  1. A feasibility study on water quality improvement in the California Aqueduct.
  2. The conclusion of feasibility studies and demonstration projects under the Southern California-San Joaquin Regional Water Quality Exchange Project.<sup>21</sup> This exchange project was discussed earlier as a mean to convey higher quality water to Metropolitan.
  3. DWR's Municipal Water Quality Investigations Program and the Sacramento River Watershed Program. Both programs address water quality problems in the Bay-Delta and Sacramento River watershed.
- Delta Improvement Package – Metropolitan in conjunction with DWR and US Geologic Survey have completed modeling efforts of the Delta to determine if levee modifications at Franks Tract would reduce ocean salinity concentrations in water exported from the Delta. Currently, tidal flows trap high saline water in the track. By constructing levee breach openings and flow control structures, it is believed saline intrusion can be reduced. This would significantly reduce total dissolved solids and bromide concentrations in water from the Delta.
- Source Water Protection – In 2001, Metropolitan completed a Watershed Sanitary Survey as required by DHS to examine possible sources of drinking water contamination and identify mitigation measures that can be taken to protect the water at the source. DHS requires the survey to be completed every five years. Metropolitan also completed a Source Water Assessment (December 2002) to evaluate the vulnerability of water sources to contamination. Water from the Colorado River is considered to be most vulnerable to contamination by recreation, urban/storm water runoff, increasing urbanization in the watershed, wastewater and past industrial practices. Water supplies from SWP are most vulnerable to urban/storm-water runoff, wildlife, agriculture, recreation, and wastewater.<sup>22</sup>

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<sup>20</sup> Arizona Department of Health Services, Topock Groundwater Study Evaluation of Chromium in Groundwater Wells, September 7, 2005.

<sup>21</sup> Metropolitan Water District of Southern California, Regional Urban Water Management Plan, September 2005 Draft

<sup>22</sup> Metropolitan Water District of Southern California, Regional Urban Water Management Plan, September 2005 Draft

## **GROUNDWATER**

OCWD manages the District's groundwater basin and conducts a comprehensive water quality monitoring program. OCWD collects over 13,500 groundwater samples each year from over 800 wells. The water quality data collected from these wells is used to assess ambient conditions of the basin, monitor the effects of extraction, monitor the effectiveness of the seawater intrusion barriers, evaluate impacts from historic and current land use, address poor water quality areas, and also provide early warning of emerging contaminants of concern.<sup>23</sup>

OCWD's water quality monitoring programs are broadly classified into three categories; (1) regulatory or compliance with permits, environmental and groundwater drinking water regulations, (2) committed OCWD and research projects, and (3) basin management, i.e., or evaluating and protecting basin water quality. OCWD is compliant with groundwater drinking water regulations and operates under a Department of Health Services' approved monitoring program that includes monitoring all drinking water wells within the OCWD, including each of the District's wells. Wells are sampled for regulated and unregulated chemicals at a required monitoring frequency.

OCWD operates an extensive groundwater quality management program that allows OCWD to address current issues and develop strategies to anticipated and resolve future issues. OCWD's 2004 Groundwater Management Plan has a section devoted solely to groundwater quality management. The groundwater quality issues facing OCWD and the District and the programs implemented to address those issues are summarized in the following sections.

### ***Nitrates***

The Orange County groundwater basin has a number of constituents that are water quality concerns. The early agricultural practices with OCWD contributed to the high concentrations of nitrates in the shallow groundwater. Although nitrates are present throughout the basin, only a small number of areas exceed the MCL. Nitrate management goals include remediating groundwater contaminated by nitrate, attaining the Regional Water Quality Control Board's groundwater subbasin nitrate-nitrogen water quality objective of 3 mg/L (the MCL is 10 mg/L), and increasing the frequency of monitoring to quarterly for those wells having concentrations of nitrate above 50 percent of the MCL. The two nitrate removal projects within Orange County include the Garden Grove Nitrate Removal Project and the Tustin Main Street Treatment Plant.

### ***Total Dissolved Solids***

Another water quality concern is total dissolved solids. OCWD has been proactive to combat the increase in salinity within the basin, however, many wells within OCWD exceed the RWQCB's water quality objective of 500 mg/L. TDS concentrations range from 223 to over 600 mg/L and averages 461 mg/L within the basin.<sup>24</sup>

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<sup>23</sup> Orange County Water District, *Groundwater Management Plan*, March 2004.

<sup>24</sup> Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005.

The TDS levels within the recharge waters are higher than the average TDS concentrations within the groundwaters, as a result the TDS concentration within the groundwater continues to rise. In response to the rising TDS concentrations, OCWD has implemented groundwater desalter projects (the Irvine Desalter and the Tustin Seventeenth Street Desalter), expanded barrier injection facilities, cooperates with upper Santa Ana watershed stakeholders to control TDS at the source, supports Metropolitan's efforts to import high quality water, maintained an aggressive monitoring program, and will implement the Groundwater Replenishment System.<sup>25</sup>

One of the major challenges for OCWD is the contamination of fresh groundwater by saltwater intrusion and therefore OCWD has implemented two seawater intrusion barriers: the Talbert Barrier and the Alamitos Barrier. The coastal seawater monitoring program focuses on the effectiveness of the barriers and the following parameters are monitored: water level elevations, chloride, TDS, electrical conductivity, and bromide. Each of these parameters aid OCWD to track the extent and movement of saline waters throughout the basin.

#### ***Volatile organic compounds (VOC)***

OCWD has an aggressive VOC monitoring program. Because of the monitoring program, VOC's have been detected a number of wells within OCWD. Several drinking water wells have been taken out of service. OCWD implemented the Irvine Desalter Project to address the VOC's and high TDS concentrations in the groundwater basin near Irvine. OCWD is also proposing the Forebay VOC Cleanup project to prevent further spread of groundwater contaminated with VOC's. The other VOC removal project is a well within the City of Santa Ana that treats water for irrigation at the River View Golf Course.

#### ***Methyl Tertiary-Butyl Ether (MTBE)***

Drinking water wells within OCWD are tested for methyl tertiary-butyl ether, more commonly known as MTBE, at least annually and in some cases quarterly. OCWD aggressively monitors for MTBE to detect a problem before it reaches a drinking water well.<sup>26</sup> The health effects of MTBE are uncertain. The U.S. Environmental Protection Agency currently classifies MTBE as a possible human carcinogen.

Unfortunately there are hundreds of identified sites with leaky underground storage tanks throughout Orange County. The majority of these sites do not have a groundwater cleanup program to remove the MTBE from the shallow groundwater. In response to the MTBE contamination, OCWD filed a lawsuit in 2003 against numerous oil and petroleum-related companies. The suit seeks funding from the responsible parties to pay for the investigation, monitoring, and removal of oxygenates from the basin.<sup>27</sup> Two wells within OCWD have been taken out of service because of MTBE contamination.

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<sup>25</sup> Orange County Water District, *Groundwater Management Plan*, March 2004

<sup>26</sup> Orange County Water District, 2001-2002 Annual Report

<sup>27</sup> Orange County Water District, *Groundwater Management Plan*, March 2004

Fortunately, a thick underground clay layer helps protect most of the groundwater basin from surface contamination of MTBE.

### ***N-nitrosodimethylamine (NDMA)***

In the year 2000, OCWD discovered NDMA, a known carcinogen, in the injection water used to prevent seawater intrusion at the Talbert Barrier. OCWD adjusted the operation of Water Factory 21, where recycled water is treated for injection, for NDMA treatment. Ultraviolet light treatment was added to the process to reduce the occurrence of NDMA in injection waters.

There is currently one NDMA removal project within OCWD. Mesa Consolidated Water District provides wellhead treatment for the removal of NDMA. The treatment process meets the current NDMA Action Level of 10 nanograms per liter and minimizes further down gradient migration of NDMA.

### ***Emerging Contaminants***

Pharmaceuticals, personal care products, and endocrine disruptors are considered emerging environmental contaminants. There are water quality concerns associated with these emerging contaminants because of their wide spread use among the population and their impact on human health because of exposure to low doses over long periods of time. OCWD is aware of these contaminants and is working with DHS to track and report their concentrations in the groundwater.

### ***Colored Groundwater***

Colored groundwater is encountered over a broad region of Orange County and is estimated to total over 1 MAF. The area identified as the “colored water” area includes the southern part the basin near the coastal area. The colored water is located at depths deeper than the clear zone and if a deep well can be constructed, a new source of water may be available. The OCWD 2004 Groundwater Management Plan reports nine wells have been drilled in the colored zone. These wells aid in reducing the groundwater level of the colored aquifer and thus minimize the potential for upward vertical migration of colored water into the clear zones.

### ***Water Quality Programs***

OCWD supports and is involved in many programs that address water quality concerns of the groundwater basin. Some of the programs and activities include:

- Source Water Protection – Similar to Metropolitan, OCWD has completed a drinking water source assessment for the existing drinking supply wells. The source water assessment develops management strategies to prevent or reduce the risks to groundwater from pollution such as:
  - 1) delineates the time-of-travel aquifer capture zone of the source and identifies land area to be protected
  - 2) identifies and locates potential sources of contamination to the well

- 3) manage land use and planning for future development
  - 4) requires development to comply with the County's Municipal Stormwater Water Quality Management Plan to protect groundwater replenishment water
- Surface Water Monitoring – OCWD also conducts routine monitoring of the Santa Ana River and other surface waterways in the upper watershed. OCWD is conducting the Santa Ana River Water Quality and Health Study to verify the sustainability of continued use of river water for recharge and its impact on groundwater quality.
  - Constructed Wetlands – OCWD operates the Prado Basin Wetland in corporation with the US Army Corps of Engineers and the US Fish and Wildlife Service to reduce the nitrogen concentration of river water. The constructed wetlands include 465 acres.
  - Public Outreach – OCWD has implemented a public education outreach program called the Groundwater Guardian Team to inform the public about the benefits of protecting the groundwater basin.
  - Regulation – In May of 1987, OCWD adopted a Groundwater Quality Protection Policy. The policy established the following objectives:
    - 1) Maintain a suitable groundwater supply for all existing and potential beneficial uses.
    - 2) Prevent degradation of the quality of the groundwater supply.
    - 3) Assist responsible regulatory agencies in identifying sources of pollution to assure cleanup by the responsible party(s).
    - 4) Maintain or increase the basin's usable storage capacity.
    - 5) Inform the general public of water quality problems as they are encountered as well as the overall condition of the groundwater supply, through appropriate regulatory agencies and groundwater producers.

### **3.2 WATER QUALITY EFFECT ON WATER MANAGEMENT STRATEGIES AND SUPPLY RELIABILITY**

The previous section summarized the general water quality issues of Metropolitan's imported water and OCWD's groundwater supplies. The same water quality concerns apply to EOCWD's water. In the near future, EPA's Stage 2 regulation of the disinfection byproducts rule will be in effect. Stage 1 was implemented in 2002 and lowered the total THM maximum annual average concentration level in water supplies; stage 2 will further lower the THM concentration level. The District's water supplies currently meet the requirements of Stage 1 and will be required to meet Stage 2 levels when those rules are finalized.

The District does not anticipate any changes in its available water supplies due to water quality issues in large part because of the mitigation actions undertaken by Metropolitan and OCWD as described earlier.



### **3.2.1 Wholesale System**

The District's Wholesale Zone operations have not experienced any significant water quality problems in the past and therefore do not anticipate any such problems in the future (the temporary bacteriologic problem experienced at the East and West wells during portions of 2003 and 2004 has been resolved and is not expected to recur). Since water quality issues are not expected to impact the District's supply, there have been no strategies developed for mitigating such impacts.

### **3.2.2 Retail System**

As previously reported, the Retail Zone purchases a significant portion of its water supply from the Wholesale Zone. To avoid repetitiveness, the reader is thus referred to the water quality discussion contained within Section 3.1.1 of this report.

The balance of the Retail Zone water supply is pumped from the Orange County Groundwater Basin. Information on the Orange County Groundwater Basin water quality is also provided in Section 3.1.1 of this report.

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## **SECTION 4 WATER RELIABILITY PLANNING**

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### **4.1 RELIABILITY OF WATER SUPPLIES**

The District and all of its subagencies as well as other communities and water agencies in Orange County are facing increasing challenges in their role as stewards of water resources in the region. The region faces a growing gap between its water requirements and its firm water supplies. Increased environmental regulations and the collaborative competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth in Orange County will increase water demand within the region and put an even larger burden on local supplies.

The District receives 100 percent of its Wholesale water supply and approximately 38 percent of its Retail water supply from Metropolitan (purchased through MWDOC). The balance of its Retail supply comes from local groundwater managed by OCWD.

The Southern California region faces a challenge between satisfying its water requirements and securing firm water supplies. Increased environmental regulations and the collaborative competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth correspond to increased water demands within the region, putting an even larger burden on local supplies.

MWDOC and OCWD are implementing water supply alternative strategies for the region and on behalf of their member agencies to ensure available water in the future. The District participates and provides input directly to these agencies for future planning purposes. Strategies are identified in the MWDOC 2005 Regional UWMP, the OCWD 2020 Master Plan Report, and the OCWD 2004 Groundwater Management Plan. The optimum water supply strategy should attempt to meet the following objectives:

- Ensure that the groundwater basin is protected
- Ensure available water for Orange County residents and businesses in the future
- Minimize the consumers water supply cost
- Use a variety of sources
- Reverse the adverse salt balance in the groundwater basin
- Provide flexibility to allow both MWDOC and OCWD to quickly take advantage of changing and new markets if and when they develop

EOCWD is able to participate in the long-term storage program by imported excess Metropolitan water when it is available in lieu of groundwater pumping. For each acre-foot of Long-Term Storage water claimed, the District is provided discounts from Metropolitan and OCWD, resulting in a unit cost of Long-Term Storage water approximately equivalent to the unit cost of pumped groundwater. Although the Long-Term Storage Program is essentially cost-neutral for the District, it provides the following benefits: (1) water is imported when Metropolitan has an abundant supply; and

(2) groundwater resources are conserved (i.e. the long-term import quantity would have been pumped from the groundwater if the EOCWD and its member agencies did not participate).

The reliability of EOCWD's water supply is currently dependent on the reliability of both groundwater and imported water supplies, which are managed and delivered by OCWD and Metropolitan, respectively. The following sections will discuss these agencies, and others throughout the region, roles in water supply reliability, and the near and long-term efforts they are involved with to ensure future reliability of water supplies to the EOCWD and the region as a whole.

#### **4.1.1 Regional Agencies and Water Reliability**

##### ***Metropolitan Water District of Southern California (Metropolitan)***

EOCWD purchases supplemental imported water from Northern California through the State Water Project and the Colorado River through Metropolitan Member Agency MWDOC. As a water wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its member agencies. Metropolitan provides an average of 60 percent of the municipal, industrial and agricultural water used within its service area. The remaining 40 percent comes from local supplies including groundwater, surface water, and recycled water.

Metropolitan's primary goal is to provide reliable water supplies to meet the water needs of its service area at the lowest possible cost. The reliability of Metropolitan's water supply has been threatened as existing imported water supplies from the Colorado River and SWP face increasing challenges. Despite these challenges, Metropolitan continues to develop and encourage projects and programs to ensure reliability now and into the future. One such project is Metropolitan's recently completed Diamond Valley Lake in Hemet, California; an 800,000 AF capacity reservoir for regional seasonal and emergency storage for SWP and Colorado River water. The reservoir began storing water in November 1999 and reached the sustained water level by early 2002.<sup>28</sup>

##### ***Colorado River Aqueduct (CRA)***

Pursuant to the 1964 U.S. Supreme Court decree, Metropolitan's dependable supply of Colorado River water was limited to 550,000 acre-feet per year assuming no surplus or unused Arizona and Nevada entitlement was available and California agricultural agencies use all of their contractual entitlement. Historically, Metropolitan has also possessed a priority for an additional 662,000 AFY depending upon availability of surplus water. In addition, Metropolitan maintains agreements for storage, exchanges and transfers within the service area of Imperial Irrigation District that provide water to Metropolitan.<sup>29</sup>

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<sup>28</sup> Metropolitan Water District of Southern California, Draft Regional Urban Water Management Plan, September 2005 Draft

<sup>29</sup> Metropolitan Water District of Southern California. Integrated Water Resources Plan. 2003 Update. May 2004.

Water supplies from the Colorado River have been and continue to be a topic of negotiation and intense debate. The 1964 Court Decree required the state of California to limit its annual use to 4.4 million acre-feet (MAF) basic annual apportionment of Colorado River water plus any available surplus. To keep California at 4.4 MAF, Metropolitan reduces its level of diversions in years when no surplus is available.

In 1999, the Colorado River Board developed “California’s Colorado River Water Use Plan,” also known as the “California Plan” and the 4.4 Plan”, which was endorsed by all seven Colorado River Basin states and the U.S. Department of the Interior. This plan developed the framework that specifies how California will transition and live within its basic apportionment of 4.4 MAF of Colorado River water.

The U.S. Bureau of Reclamation implemented Interim Surplus Guidelines to assist California’s transition to the Plan. Seven priorities for use of the waters of the Colorado River within the State of California were established. Metropolitan would only be able to exercise its fourth priority right to 550,000 AF annually, instead of the maximum aqueduct capacity of 1.3 MAF. Priorities 1 through 3 cannot exceed 3.85 MAF annually. Together, Priorities 1 through 4 total California’s 4.4 MAF apportionment.

In October 2003, the Quantification Settlement Agreement (QSA), a critical component of the California’s Colorado River Water Use Plan and for purposes of Section 5(B) of the Interim Surplus Guidelines, was authorized defining Colorado River water deliveries, delivery of Priority 3(a) and 6(a) Colorado River water, and transfer and other water delivery commitments, thus facilitating the transfer of water from agricultural agencies to urban uses. The QSA is a landmark agreement, signed by the four California Colorado River water use agencies and the U.S. Secretary of the Interior, which will guide reasonable and fair use of the Colorado River by California through the year 2037.

Metropolitan’s Integrated Water Resources Plan 2003 Update, recognizes that the QSA supports Metropolitan’s development plans for CRA deliveries, and demonstrates the reliability benefits as a result of the QSA and existing supply enhancement programs.

### ***State Water Project (SWP)***

The reliability of the SWP impacts Metropolitan’s member agencies’ ability to plan for future growth and supply. DWR’s Bulletin 132-03, December 2004, provides certain SWP reliability information, and in 2002, the DWR Bay-Delta Office prepared a report specifically addressing the reliability of the SWP.<sup>30</sup> This report, *The State Water Project Delivery Reliability Report*, provides information on the reliability of the SWP to deliver water to its contractors assuming historical precipitation patterns. The following SWP reliability information is included in these reports.

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<sup>30</sup> Department of Water Resources, State Water Project Delivery Reliability Report. 2002.

On an annual basis, each of the 29 SWP contractors including Metropolitan request an amount of SWP water based on their anticipated yearly demand. In most cases, Metropolitan's requested supply is equivalent to its full Table A Amount<sup>31</sup>; currently at 1,911,500 AFY. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, the SWP annual delivery of water to contractors has ranged from 552,600 AFY in 1991 to 3.5 MAF in 2000. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A Amount, but instead a percentage of that amount based on the available supply.

Typically, around December of each year, DWR provides the contractors with their first estimate of allocation for the following year. As hydrologic and water conditions develop throughout the year, DWR revises the allocations. On January 14, 2005, SWP supplies were projected to meet 60 percent of most SWP contractor's Table A Amounts. This allocation was increased to 70 percent on April 1, 2005 and again increased to 90 percent on May 27, 2005. The percentages, however, could easily have been reduced depending on changes in the year's hydrologic and water conditions. For the year 2006, DWR announced a 55 percent initial allocation of contractor's Table A Amounts on November 23, 2005. This percent will likely change (increase or decrease) throughout next year based on hydrologic conditions. Due to the variability in water supply for any given year, it is important to understand the reliability of the SWP to supply a specific amount of water each year to the contractors.

DWR is preparing an update to the SWP Reliability Report issued in 2003 and expects it to be complete by the end of 2005. On November 18, 2005, DWR released the draft of the 2005 SWP Delivery Reliability Report for public review and comment. The draft Reliability Report updates the reliability report finalized in 2003 with the inclusion of two updated studies. The updated studies, 4 and 5, contain the most current information for assumed demands of SWP contractors. The results of studies 4 and 5 show average deliveries of 69 percent of full Table A under current conditions and 77 percent under future conditions. The more recent studies also show a minimum delivery of 4 and 5 percent, current and future years respectively, compared to 20 percent for the 2003 report. These amounts are shown in Table 4.1.1-1 on the following page compared to the earlier CALSIM modeling as discussed below.

DWR analyzed the SWP's reliability using the California Water Allocation and Reservoir Operations Model (CALSIM II model) in their Reliability Report. The CALSIM II model was developed by DWR and the U.S. Bureau of Reclamation (USBR) to simulate operations of the SWP and the Central Valley Project (CVP). The CALSIM II model is used to estimate water deliveries to both SWP and CVP users under various assumptions such as hydrologic conditions, land use, regulations, and facility configurations.

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<sup>31</sup> Two types of deliveries are assumed for the SWP contractors: Table A and Article 21. Table A Amount is the contractual amount of allocated SWP supply; it is scheduled and uninterruptible. Article 21 allows SWP contractors to receive additional water deliveries only under specific conditions. [Department of Water Resources, State Water Project Delivery Reliability Report, 2002.]

Documentation for CALSIM II, including assumptions, can be found on the DWR Web site at <http://modeling.water.ca.gov>.

One of the key assumptions of the CALSIM II model is that past weather patterns will repeat themselves in the future. The model uses a monthly time step to calculate available water supply based on historical rainfall data from 73 years of records (1922 – 1994). The model scenarios used in the preparation of the Reliability Report also assumed that regulatory requirements and facilities would not change in the future. DWR considered this assumption conservative since additional facilities such as reservoirs may be implemented in the future to specifically increase the SWP’s reliability.

The CALSIM II model was used to complete three benchmark studies dated May 17, 2002 for the Reliability Report. The benchmark studies evaluated the water supply and demand at the 2001 condition and at the 2021 condition. In 2001, SWP water demand was estimated to vary from 3.0 to 4.1 MAF per year depending on the weather conditions (wet or dry years). SWP water demands in 2021 were estimated to range from 3.3 to 4.1 MAF per year. DWR prepared two benchmark studies for the 2021 condition. The first study assumed that SWP water demands would depend on weather conditions, whereas the second study assumed the contractor’s water demand would be their maximum Table A Amount; 4.1 MAF per year regardless of weather. Table 4.1.1-1 shows the results, which demonstrate that SWP deliveries, on average, can meet 75 percent of the maximum Table A Amount.

**Table 4.1.1-1  
SWP Table A Deliveries from the Delta  
Percent of Total Table A Amount of 4.133 MAF  
(MAF)**

<b>Study</b>	<b>Average</b>	<b>Maximum</b>	<b>Minimum</b>
2001 Study	2.962 (72%)	3.845 (93%)	0.804 (19%)
2021 Study A <sup>[1]</sup>	3.083 (75%)	4.133 (100%)	0.830 (20%)
2021 Study B <sup>[2]</sup>	3.130 (76%)	4.133 (100%)	0.830 (20%)
Revised-Demand Today <sup>[3]</sup>	2.818 (69%)	3.848 (94%)	0.159 (4%)
Revised-Demand Future <sup>[4]</sup>	3.178 (77%)	4.133 (100%)	0.187 (5%)

Source: Department of Water Resources, Excerpts from Working Draft of 2005 SWP Delivery Reliability Report – Attachment 1, May 25, 2005

<sup>[1]</sup> Assumes demands depend on weather conditions.

<sup>[2]</sup> Assumes demands at maximum Table A amount.

<sup>[3]</sup> Revises demands to current conditions.

<sup>[4]</sup> Revises demands at levels of use projected to occur by 2025.

The Monterey Agreement states that contractors will be allocated part of the total available project supply in proportion to their Table A Amount. The Monterey Agreement changed SWP water allocation rules by specifying that, during drought years, project supplies be allocated proportionately based on the maximum contractual Table A Amount. Water is allocated to urban and agricultural purposes on a proportional basis, deleting a previous initial supply reduction to agricultural contractors. The agreement further defines and permits permanent sales of SWP Table A Amounts and provides for transfer of up to 130,000 AF of annual Table A Amounts from agricultural use to municipal use. The Agreement also allows SWP contractors to store water in another agency's reservoir or groundwater basin, facilitates the implementation of water transfers and provides a mechanism for using SWP facilities to transport non-project water for SWP water contractors. The Agreement provides greater flexibility for SWP contractors to use their share of storage in SWP reservoirs.

***Report on Metropolitan's Water Supplies: Blueprint for Water Reliability***

Metropolitan released a *Report on Metropolitan's Water Supplies, A Blueprint for Water Reliability* on March 25, 2003, to provide updated information on Metropolitan's projected supply and demand for incorporation into Water Verification and Water Supply Assessments for compliance with SB 221 and SB 610, respectively. These bills implement requirements to connect land use to a sufficient water supply before a development can be approved. The Metropolitan report addresses water supply reliability issues and states Metropolitan's roles and responsibilities, which include the following: (1) implementing water management programs that support the development of cost-effective local resources; (2) securing additional imported supplies as necessary through programs that increase the availability of water delivered through the Colorado River Aqueduct and the SWP; (3) providing the infrastructure needed to integrate imported and local sources; (4) establishing a comprehensive management plan dealing with periodic surplus and shortage conditions; and (5) developing a rate structure that strengthens Metropolitan's financial capabilities to implement water supply programs and make infrastructure improvements.

The report details that Metropolitan's regional water demand projections are 6 percent to 16 percent *higher*, depending on which 5-year projection period and 11 percent for Year 2025, than the aggregated projections of Metropolitan's member agencies. As stated in the Report, "this difference indicated that Metropolitan supplies would provide a level of 'margin of safety' or flexibility to accommodate delays in local resources development or adjustments in development plans."<sup>32</sup> Additionally, the report concludes that "current practices allow Metropolitan to bring water supplies on-line at least ten years in advance of demand with a very high degree of reliability." More particularly, Metropolitan documented sufficient currently available supplies to meet 100 percent of member agencies' supplemental water demands for 20 years under Average and Wet Year conditions, for 15 years under Multiple Dry Year conditions (with 8 to 26 percent reserve capacity), and for 15 years under Single Dry Year conditions (with 8-25 percent reserve

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<sup>32</sup> Metropolitan Water District of Southern California. Report on Metropolitan Water Supplies, A Blueprint for Water Reliability, p. 9. March 25, 2003.

capacity). With the addition of supplies under development, Metropolitan will be able to meet 100 percent of its agencies' supplemental water needs under all supply and demand conditions through 2025 with 20-25 percent reserve capacity.<sup>33</sup>

The Report also identifies the ways Metropolitan is managing changes in Southern California's water supplies, including reduced Colorado River deliveries and water quality constraints. In addition, opportunities for additional supplies are currently being implemented in the following ways:

- 1) Full Diamond Valley Lake: The Lake is now fully operational with an increased conveyance capacity for refill system storage.
- 2) Re-Operation of Storage and Transfer Programs: In 2003, Metropolitan developed additional storage and transfer capabilities and completed filling local resources to achieve full storage accounts in operational reservoirs and banking/transfer programs.
- 3) Enhanced Conservation Programs: A new campaign is designed to encourage more efficient outdoor water use and promote innovative conservation measures.
- 4) Development of Additional Local Resources: There are promising opportunities identified to develop seawater desalination and expand the Local Resources Program.

In addition to the *Report on Metropolitan's Water Supplies, A Blueprint for Water Reliability*, MWD's September 2005 Draft Regional Urban Water Management Plan (RUWMP) demand and supply analysis also projects surpluses (of regional supplies compared with regional demands) ranging from 5 percent to 35 percent in all years and all drought scenarios through 2030.<sup>34</sup>

As demand forecasts are refined, supply goals are also refined. Metropolitan has consistently supplied over 50 percent of water supplies to the Southern California region. To continue to accomplish this, Metropolitan continues to approve new and innovative projects and programs to ensure reliability. For example, in August 2001, Metropolitan took action to move forward initiatives to bolster future supplies by supporting seawater desalination projects, increased commercial conservation efforts, improve water quality by decreasing salinity in supplies from the State Water Project and the Colorado River, increased underground storage and retrieval facilities, adopted principles for establishing cooperative programs, and endorsed legislation that would further water reliability. Some of these projects are further described in Section 4.4.

### ***Integrated Water Resources Plan (IRP)***

To address Metropolitan's reliability challenges, Metropolitan and its member agencies developed an Integrated Water Resources Plan (IRP) in 1996. The overall objective of the IRP process is the selection and implementation of a Preferred Resource Mix (or strategy) consisting of complementary investments in local water resources, imported

<sup>33</sup> Metropolitan Water District of Southern California. Report on Metropolitan Water Supplies, A Blueprint for Water Reliability, p. 24-25. March 25, 2003.

<sup>34</sup> Tables II-7, 8 and 9 of MWD's September 2005 Draft Regional Urban Water Management Plan.



supplies and demand-side management that meet the region's desired reliability goal in a cost-effective and environmentally sound manner. The 1996 IRP was reviewed as part of Metropolitan's strategic plan and rate refinement to guide the development and implementation of revised Metropolitan water management programs through the year 2005.

The IRP 2003 Update was approved and released July 13, 2004, and includes various projects and programs that contribute to the reliability of Metropolitan's imported water supplies. The IRP Update concluded that the resource targets from the 1996 IRP, factored in with changed conditions, will continue to provide for 100 percent reliability through 2025.

While the IRP 2003 Update includes goals for a variety of resource targets, it identified the most significant programs as conservation and local supply development among the Preferred Resource Mix. The IRP details the Local Resources Program (LRP) and the Seawater Desalination Program as a means to increase reliability of local supplies. Metropolitan initiated the LRP to promote the development of water recycling projects that reduced demand for imported water and improved regional water supply reliability in 1982. In 1991, the Groundwater Recovery Program was implemented to similarly promote the recovery of local degraded groundwater supplies. In 1995, both programs were combined into the LRP. Currently, the LRP, including both recycling and groundwater recovery, has invested over \$121 million and partnered with member agencies on 53 recycled water projects and 22 groundwater recovery projects generating 251,000 acre feet of local supply in 2002.<sup>35</sup>

The IRP 2003 Update states that Metropolitan's regional production target is 500,000 AF by 2020 for its LRP. Metropolitan's current projection of regional implementation of recycling, groundwater recovery, and seawater desalination resource targets exceeds the 1996 IRP goals. Although in FY 2002, recycling and groundwater recovery programs narrowly missed their target, the region is expected to meet its 2010 and 2020 targets. Meeting the targets will require the region to produce 159,000 AF of additional local project and/or seawater desalination supply by 2010 and 249,000 AF by 2020. Overall, the region has developed about 50 percent of the 1996 IRP local resources target for 2020.

Metropolitan continues to encourage development of local water resource projects through offering financial incentives through the LRP to its member agencies. These anticipated water supply benefits are incorporated into the forecasts of demand on Metropolitan.

In addition to the LRP, Metropolitan also provides financial and technical assistance for implementing water conservation Best Management Practices, as well as a significant investment in regional and local water conservation programs. Metropolitan was also

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<sup>35</sup> Metropolitan Water District of Southern California. Integrated Water Resources Plan, 2003 Update. May 2004.

responsible for distributing \$45 million in funds from Proposition 13 funding for development of conjunctive management programs in Southern California.

### ***Municipal Water District of Orange County (MWDOC)***

In 1951, MWDOC was formed to provide supplemental water to many purveyors within Orange County who were not Metropolitan member agencies. MWDOC was formed for the purpose of contracting with Metropolitan to acquire supplemental import water supplies from northern California and the Colorado River for use within the Orange County area. MWDOC is Metropolitan's second largest wholesale member agency. MWDOC represents 30 member agencies, including 14 special districts, 14 city water departments, one private water company and one mutual water company.

MWDOC represents its members at a regional, state and federal level, and advocates for the development and protection of imported water supplies and planning along with coordinating the water needs for its service area.<sup>36</sup> MWDOC's water management goals and objectives include working together with Orange County water agencies, including the District, to focus on solutions and priorities for improving Orange County's future water supply reliability.

MWDOC's engineering and planning staffs also represent its member agencies' interests in such water planning efforts as Metropolitan's IRP and Water Surplus and Drought Management (WSDM) Plan, the focus on Orange County's water future effort, and the Orange County Water Plan. Through these efforts, the goal is to improve water planning in Orange County to ensure a high degree of reliability and quality in future water supplies.<sup>37</sup>

Efforts of MWDOC to maintain a reliable water supply include a commitment to the intensive and cost-effective development of Orange County's water resources. Development of local water supplies will lessen Orange County's dependence on imported water. Therefore, in order to maintain a more reliable water supply, a number of projects including storage, recycling, conjunctive use with groundwater basins, ocean desalination and new groundwater development will contribute to enhanced water reliability.

Programs and projects directly managed by MWDOC include exchanges and transfers, participation with the Best Management Practices (BMPs) as well as extensive conservation and educational programs available to its member agencies. These programs and projects support further water reliability for its member agencies and throughout Orange County.<sup>38</sup>

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<sup>36</sup> [On-Line]. Municipal Water District of Orange County. Available: <http://www.mwdoc.com>. 2002.

<sup>37</sup> MWDOC. Regional Urban Water Management Plan, p. 1-7. 2000.

<sup>38</sup> MWDOC. Regional Urban Water Management Plan. 2005.

### ***Integrated Regional Water Management Plan***

MWDOC has been working with the County of Orange, as the lead agency, and 24 other cities and special districts to develop and integrate regional strategies for water management within the region. In an effort to manage local and imported water supplies, projects have been identified that protect communities from drought, enhance water supply reliability, ensure continued water security, optimize watershed and coastal resources, improve water quality, and protect habitat. To date, nearly 100 projects have been identified and the responsibility of implementing the projects has been granted to the South Orange County Integrated Regional Water management (IRWM) Group.

### ***South Orange County Water Reliability Study***

To ensure continued water reliability for south Orange County, 11 Orange County agencies, Metropolitan, and the USBR joined together to fund the South Orange County Water Reliability Study (SOCWRS). MWDOC served as the lead agency in this effort.

The SOCWRS provides an objective plan that addresses the pressing need to ensure water supply in the event of future water supply outages and/or emergencies. Although the study is focused on south Orange County, implementing measures recommended in the study will provide regional benefits for all of Orange County's water supply, and thus benefit the District.

The purpose of the SOCWRS was to do the following:<sup>39</sup>

1. Identify risks, including earthquakes that pose the greatest threat to the regional water treatment and distribution infrastructure.
2. Identify ways to bolster source-of-supply and regional distribution systems, building on earlier engineering investigations and studies.
3. Develop a list of projects that accomplish the above objectives, and identify appropriate investments.
4. Allow for flexibility in phasing. Most notably project operational dates and sizing should be flexible to account for changes in local resources development.
5. The plan builds on a number of prior studies, including: SOCWRS Phase 1, which served as the foundation for this effort; Metropolitan's Central Pool Augmentation Project, currently in project right-of-way refinement; Santa Margarita Water District's Lined and Covered Reservoir investigations to increase local storage for emergency need; Irvine Ranch Water District's Water Resources Master Plan Update and Planning Area-6 Sub-Area Master Plan; and various Orange County Water District plans and groundwater basin operations studies.

The SOCWRS also identifies key planning principles that were used to guide the formulation of alternatives, including such items as accommodating Metropolitan planned shutdowns, regional project planning, Metropolitan system investments for improved system operation and capability, and assessment of risks and scenarios.

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<sup>39</sup> MWDOC. South Orange County Water Reliability Study: Phase 2 System Reliability Plan. June 2004.

Based on the analysis of water supply outages, the SOCWRS recommended projects that would provide a reliable supply for south Orange County in the event of an emergency. The projects are grouped into the following three categories: 1) regional distribution system; 2) storage/treatment; and 3) ocean desalination. The projects are expected to minimize shortages. Currently, MWDOC is seeking to implement the recommended plan with south Orange County agencies.

### **Orange County Water District (OCWD)**

OCWD is responsible for the protection of water rights to the Santa Ana River in Orange County as well as the management and replenishment of the basin.<sup>40</sup> OCWD replenishes and maintains the basin at safe levels while more than doubling the basin's annual yield with the best available technology. OCWD primarily recharges the basin with water from the Santa Ana River and to a lesser extent with imported water purchased from Metropolitan. Other processes such as recycling of wastewater, conservation and water use efficiency programs, and creative water purchases have aided in replenishing the basin to desired levels to meet required demands.

Furthermore, OCWD has invested over \$250 million in seawater intrusion control (injection barriers), recharge facilities, laboratories, and basin monitoring to effectively manage the basin.<sup>41</sup> Consequently, although the basin is defined to be in an "overdraft" condition, it is actually managed to allow utilization of up to 500,000 AF of storage capacity of the basin during dry periods, acting as an underground reservoir and buffer against drought.<sup>42</sup> OCWD also operates the basin to keep the target dewatered basin storage at 200,000 AF as an appropriate accumulated overdraft. If the basin is too full, artesian conditions can occur along the coastal area, causing rising water and water logging, an adverse condition.

Since the formation of OCWD in 1933, OCWD has made substantial investment in facilities, basin management and water rights protection, resulting in the elimination and prevention of adverse long-term "mining" overdraft conditions. OCWD continues to develop new replenishment supplies, recharge capacity and basin protection measures to meet projected production from the basin during average/normal rainfall and drought periods.<sup>43</sup>

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<sup>40</sup> OCWD Groundwater Management Plan, 2004.

<sup>41</sup> Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005, p. 9. 2000-2001.

<sup>42</sup> Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005, p. 10. 2000-2001.

<sup>43</sup> Orange County Water District, *Draft 2003-2004 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2005. 2000-2001.

***OCWD Long Term Facilities Plan***

OCWD is preparing the Long Term Facilities Plan (LTFP) and will evaluate potential projects that may be implemented in the 20-year planning period. The LTFP's goal is to enhance basin management and water quality management activities. The LTFP is proposed to do the following:

- Evaluate projects to cost effectively increase the amount of sustainable basin production and protect water quality;
- Develop an implementation program for the recommended projects;
- Establish the basin's future maximum (target) annual production amount and correspondingly how much new recharge capacity would be required; and
- Estimate impacts to potential future Replenishment Assessment and Basin Production Percentage rates.

A program environmental impact report (PEIR), pursuant to California Environmental Quality Act (CEQA), is being prepared to evaluate environmental impacts of projects in the LTFP and increased levels of basin production to serve lands currently within OCWD plus proposed annexations of lands, including by the City of Anaheim and Irvine Ranch Water District. In the PEIR, OCWD's groundwater model would be used to evaluate groundwater conditions, such as groundwater elevations and protection of basin water supplies from seawater intrusion, for specified amounts of basin production with and without annexation.

The LTFP utilizes information recently developed in OCWD's Groundwater Management Plan and Recharge Development Study. The LTFP includes a master list of developed and proposed projects. The various projects are grouped into five categories: 1) recharge facilities, 2) water source facilities, 3) basin management facilities, 4) water quality management facilities, 5) operational improvements facilities. Each project is evaluated using criteria such as technical feasibility, cost, institutional support, functional feasibility, and environmental compliance. The LTFP develops an implementation plan for the 28 recommended projects over the 20 year planning period.

At the time of this Plan, the LTFP was scheduled to be complete in 2005, and would be updated periodically to reflect changes in pumping and basin response forecasts to future production increases.

***OCWD 2020 Water Master Plan Report (MPR)***

OCWD's 2020 Water Master Plan Report (MPR) describes local water supplies and estimates their availability extending to the year 2020. Specifically, OCWD states in their 2020 Water MPR that significant water supply sources will be available in the future for potable, non-potable, and recharge purposes. The 2020 Water MPR discusses source waters such as imported water from Metropolitan; base flows from the Santa Ana River, treated wastewater through the OCWD/OCSD Groundwater Replenishment System (GWRS) program; and possibly desalinated ocean water. The local supplies' availability

and projections from the 2020 Water MPR are not being pursued, but instead will be revised and replaced with the LTFP.

### ***Orange County Sanitation District (OCSD)***

Wastewater from some areas of the EOCWD Wholesale system service area is collected and treated by OCSD. OCSD manages wastewater collection and treatment for approximately 471 square miles in central and northwest Orange County, which includes 21 cities, 3 special districts, and 2.4 million residents. OCSD utilizes Reclamation Plant No. 1 in Fountain Valley and Treatment Plant No. 2 in Huntington Beach to treat a combined daily average of 264 million gallons of wastewater. Plant No. 1 has a design capacity of 174 million gallons per day (MGD) and averages 90 MGD, while Plant No. 2 has a design capacity of 276 MGD and averages 153 MGD.<sup>44</sup> Effluent from Reclamation Plant No. 1 is either routed to the ocean disposal system or is sent to the OCWD facility, Green Acres Project, for advanced treatment and recycling. The Green Acres Project supplies recycled water to various municipal users in Orange County and offsets the demand for potable water supplies.

### ***OCWD/OCSD Groundwater Replenishment System (GWRS)***

The GWRS is a jointly funded project of OCWD and OCSD. The GWRS is a water supply project designed to ultimately reuse approximately 120,000 AFY of advanced treated wastewater. The GWRS is a water supply project designed to ultimately reuse approximately 110,000 AFY of advanced treated wastewater.<sup>45</sup> The objective of the project is to develop a new source of reliable, high quality, low salinity water that will be used to replenish the Basin and expand the existing seawater intrusion barrier. Additional information regarding the GWRS is presented in Section 8. The benefits of the proposed GWRS include:

- Supply a significant amount of highly treated recycled water required by OCWD to maintain a higher basin production percentage through and beyond the year 2020.
- Provide a reliable replenishment water supply in times of drought.
- Expand the seawater intrusion barrier to provide additional groundwater production in the coastal zone.

### ***Santa Ana Watershed Project Authority***

The Santa Ana Watershed Project Authority (SAWPA) is a Joint Powers Authority and carries out functions useful to its member agencies. SAWPA is located in the geographic center of the Santa Ana Watershed in Riverside, California. SAWPA was formed in 1968 as a planning agency and reformed in 1972 with a mission to plan and build facilities to protect the water quality of the Santa Ana River Watershed. OCWD is a member agency

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<sup>44</sup> [On-Line] OCSD. Facts and Key Statistics. [www.ocsd.com](http://www.ocsd.com). January 2005

<sup>45</sup> Orange County Water District, Draft Long-Term Facilities Plan Review Draft, August 2005.

of SAWPA, whose activities and projects significantly contribute to the health of the Watershed and the Orange County Groundwater Basin.

The state is facing many challenges in ensuring there is sufficient, high-quality water for the ever-growing population of the region. SAWPA works with planners, water experts, design and construction engineers, other government agencies to identify issues and solutions, and then use innovation to resolve many water-related problems. SAWPA also works with legislators on ensuring there are useful laws on water resources, with funding sources to ensure that necessary projects can be completed, with planners to ensure that there is enough water in the future, with regulators to ensure that the water is safe and clean, and with all other stakeholders (including the concerned public) to build collaborative, regional solutions to the area's water needs.

SAWPA owns and operates the Santa Ana Regional Interceptor (SARI) line, a buried pipeline that captures Desalter Brine and other industrial/private waste waters and sends them to wastewater treatment facilities in Orange County before they can degrade the water quality in the watershed. The SARI line is designed to convey 30 MGD of non-reclaimable wastewater from the upper Santa Ana River basin to the ocean for disposal, after treatment. The non-reclaimable wastewater consists of Desalter concentrate and industrial wastewater. Domestic wastewater is also received on a temporary basis.

The Arlington Desalter removes salt from water extracted from the Arlington Groundwater Basin and delivers the treated water to OCWD for percolation into Orange County's groundwater basin. In order to reduce reliance on imported State Project and Colorado River water and to remove salts from the groundwater basins, a number of additional desalters are under construction, or planned for the near future.

### ***Regional Water Quality Control Board – Region 8***

#### ***Background***

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (Regional Boards) are responsible for the protection and, where possible, the enhancement of the quality of California's waters. The SWRCB sets statewide policy, and together with Regional Boards, implements state and federal laws and regulations. Each of the nine Regional Boards adopts a Water Quality Control Plan or Basin Plan, which recognizes and reflects regional differences in existing water quality, the beneficial uses of the region's ground and surface waters, and local water quality conditions and problems.<sup>46</sup>

In 1975, the Santa Ana Regional Water Quality Control Board (RWQCB) adopted the original Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin. In 1995, the RWQCB updated the Basin Plan to address issues that had evolved over time due to increasing populations and changing water demands in the region. The scope of the

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<sup>46</sup> Santa Ana Regional Water Quality Control Board. Region 8 Water Quality Control Plan (Santa Ana River Basin). January 1995.

document covers the Santa Ana River Basin, which includes the upper and lower Santa Ana River watersheds including northwestern Orange County. In 2002, a triennial review of the Basin Plan was performed. In July 2002, at a public hearing, the RWQCB adopted Resolution No. R8-2002-0070, approving the Triennial Review Priority List and Work Plan.

The Basin Plan is more than just a collection of water quality goals and policies, descriptions of conditions, and discussions of solutions. It is also the basis for the RWQCB's regulatory programs. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The RWQCB also regulates water discharges to minimize and control their effects on the quality of the region's ground and surface water. Permits are issued under a number of programs and authorities.

Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. Legal basis and authority for the RWQCB reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code (Porter-Cologne Water Quality Control Act) and the Clean Water Act.<sup>47</sup>

### ***Key Regional Issues***

Water quality degradation due to high concentrations of nitrogen and total dissolved solids (TDS) is the most significant regional water quality problem in the Santa Ana River Watershed (Watershed). Historically, the Santa Ana River likely flowed during most of the year, recharging deep alluvial groundwater basins in the inland valley and the coastal plain. However, irrigation projects eventually led to the diversion of all surface flow in the river, and the quantity of groundwater recharge diminished greatly. Water quality concerns in the Watershed focus on elevated concentrations of TDS and total inorganic nitrogen (TIN).

A Task Force was formed in 1995 to provide oversight, supervision, and approval of a study to evaluate the impact of TIN and TDS on water resources in the Watershed. The study is coordinated by SAWPA and is investigating questions related to TIN and TDS management in the Watershed, including groundwater subbasin water quality objectives, subbasin boundaries, and regulatory approaches to wastewater reclamation and recharge.<sup>48</sup>

### ***Water Resources and Water Quality Management***

Numerous water resource management studies and projects, focused on water quality and/or water supply, are in progress in the Region under the auspices of a variety of parties. As stated above, the RWQCB has been working with SAWPA concerning water

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<sup>47</sup> Santa Ana Regional Water Quality Control Board. Region 8 Water Quality Control Plan (Santa Ana River Basin). January 1995.

<sup>48</sup> Santa Ana Regional Water Quality Control Board. Watershed Management Initiative. Revised May 2004.



supply and reliability issues. SAWPA has been studying TIN and TDS issues and is a valuable partner in water resource and water quality management. SAWPA, and its member agencies, conduct water related investigations and planning studies, and build physical facilities where needed for water supply, wastewater treatment or water quality remediation. Other studies and projects ongoing and planned that will affect reliability and quality of water supplies to the Region, including areas affecting water supplies in the Orange County Basin, are discussed further in following sections of this Assessment.

Some of these activities bear directly on the implementation of the Basin Plan, while others may lead to future Basin Plan amendments to incorporate appropriate changes, such as revised regulatory strategies for various dischargers. These investigations and the implementation of appropriate physical solutions are an essential and integral part of the effort to restore and maintain water quality in the Region.

## **4.2 DEMAND AND SUPPLIES RELIABILITY COMPARISON**

### **4.2.1 EOCWD Wholesale Service Area**

As previously noted, EOCWD is a member agency of MWDOC, which is a member agency of Metropolitan. In its September 2005 Draft Regional UWMP, Metropolitan chose the year 1977 as the single driest year since 1922 and the years 1990-1992 as the multiple driest years over that same period. These years have been chosen because they represent the timing of the least amount of available water resources from the SWP, a major source of Metropolitan's supply.

Over the 20-year period beginning in 2010 and ending in 2030, Metropolitan projects a 0.5 percent decrease in available supply during an average year, a 4.5 percent increase during a single dry year, and a 3.8 percent increase during the third year of the multiple dry year period. The increased available supplies during drought year scenarios are primarily due to increased contract allotments of in-basin storage as well as a number of supplies under development.

In its draft report, Metropolitan also projects an increase in member agency demands. Specifically, they project a 10.2 percent increase over the same 20-year period in the average demand, an 8.5 percent increase during the single dry year scenario, and an 8.9 percent increase during the multiple dry year scenario. However, in all cases, the projected regional increase in demands by member agencies are offset by available surpluses in the Metropolitan supply.

Table 4.2.1-1 summarizes Metropolitan's current imported supply availability projections for average and single dry years over the 20-year period beginning in 2010 and ending in 2030. Based on these projections, Metropolitan will be able to meet all of its projected single dry year service area demands through the year 2030.

**Table 4.2.1-1  
Metropolitan Regional Imported Water Supply Reliability Projections  
for Average and Single Dry Years<sup>49</sup>  
(AFY)**

Row	Region Wide Projections	2010	2015	2020	2025	2030
<b>Supply Information</b>						
A	Projected Supply During an Average Year <sup>[1]</sup>	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
B	Projected Supply During a Single Dry Year <sup>[1]</sup>	2,842,000	3,033,000	3,002,000	2,970,000	2,970,000
C = B/A	Projected Supply During a Single Dry Year as a % of Average Supply	<b>106.5</b>	<b>116.7</b>	<b>113.1</b>	<b>111.9</b>	<b>111.9</b>
<b>Demand Information</b>						
D	Projected Demand During an Average Year	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
E	Projected Demand During a Single Dry Year	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
F = E/D	Projected Demand During a Single Dry Year as a % of Average Demand	<b>112.4</b>	<b>112.0</b>	<b>112.3</b>	<b>111.7</b>	<b>110.7</b>
<b>Surplus Information</b>						
G = A-D	Projected Surplus During an Average Year	628,000	547,000	665,000	539,000	405,000
H = B-E	Projected Surplus During a Single Dry Year	549,000	732,000	768,000	607,000	481,000
<b>Additional Supply Information</b>						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	<b>130.8</b>	<b>126.6</b>	<b>133.4</b>	<b>125.5</b>	<b>118.0</b>
J = A/E	Projected Supply During an Average Year as a % of Demand During a Single Dry Year	<b>116.3</b>	<b>113.0</b>	<b>118.8</b>	<b>112.3</b>	<b>106.6</b>
K = B/E	Projected Supply During a Single Dry Year as a % of Single Dry Year Demand (including surplus)	<b>123.9</b>	<b>131.8</b>	<b>134.3</b>	<b>125.6</b>	<b>119.3</b>

<sup>[1]</sup> Projected supplies include current supplies and supplies under development, but are limited by MWD's 1.25 MAF allotment to Colorado River Water; data obtained from MWD September 2005 Draft Regional UWMP supply/demand projections.

<sup>49</sup> Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft

Table 4.2.1-2 summarizes Metropolitan's current imported supply availability projections over the 20-year period beginning in 2010 and ending in 2030 for average and multiple dry year scenarios. When reviewing Table 4.2.1-2, it is important to note that Metropolitan is projecting a surplus of supply for all multiple dry year scenarios through 2030.

The findings in this plan were derived based upon Metropolitan's September 2005 Draft Regional UWMP. These figures can be interpolated to project Metropolitan's ability to meet a specified demand expressed in terms of a percentage of average demand and supply availability. When viewed on a regional basis, some member agency demands will exceed these averages, while others will fall below the stated averages. However, when viewed from the regional perspective, it is reasonable to assume that these averages will apply to all local water purveyors.

Although a less conservative assumption might suggest surplus water supplies not used by agencies experiencing low or no growth may be freed up for use by those water purveyors experiencing more growth, this is not borne out by the overall Metropolitan supply and demand picture. In fact, Metropolitan is projecting a 19.4 percent increase in total demand (including local supplies) over its entire service area between 2005 and 2030 (4,115,700 AFY to 4,914,000 AFY)<sup>50</sup> compared with a 20.9 percent increase in population over the same period of (18,233,700 to 22,053,200)<sup>51</sup>. In other words, Metropolitan's projected increase in demand roughly parallels its projected increase in population.

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<sup>50</sup> Table A.1-5 from MWD September 2005 Draft RUWMP

<sup>51</sup> Table A.1-2 from MWD September 2005 Draft RUWMP

**Table 4.2.1-2  
Metropolitan Regional Imported Water Supply Reliability Projections  
for Average and Multiple Dry Years<sup>52</sup>  
(in AFY)**

Row	Region Wide Projections	2010	2015	2020	2025	2030
<b>Supply Information</b>						
A	Projected Supply During an Average Year <sup>[1]</sup>	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
B	Projected Supply During Year 3 of a Multiple Dry Year Period*	2,619,000	2,776,600	2,741,000	2,719,000	2,719,000
C = B/A	Projected Supply During Year 3 of a Multiple Dry Year as a % of Average Supply	<b>98.2</b>	<b>106.8</b>	<b>103.3</b>	<b>102.4</b>	<b>102.4</b>
<b>Demand Information</b>						
D	Projected Demand During an Average Year	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
E	Projected Demand During Year 3 of a Multiple Dry Year Period <sup>[2]</sup>	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
F = E/D	Projected Demand During Year 3 of a Multiple Dry Year Period as a % of Average Demand	<b>116.5</b>	<b>116.4</b>	<b>116.5</b>	<b>116.0</b>	<b>115.0</b>
<b>Surplus Information</b>						
G = A-D	Projected Surplus During an Average Year	549,000	732,000	768,000	607,000	481,000
H = B-E	Projected Surplus During Year 3 of a Multiple Dry Year Period	243,000	377,000	424,000	265,000	132,000
<b>Additional Supply Information</b>						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	<b>130.8</b>	<b>126.6</b>	<b>133.4</b>	<b>125.5</b>	<b>118.0</b>
J = A/E	Projected Supply During an Average Year as a % of Demand During Year 3 of a Multiple Dry Year	<b>112.3</b>	<b>108.8</b>	<b>114.5</b>	<b>108.1</b>	<b>102.6</b>
K = B/E	Projected Supply During a Multiple Dry Year as a % of Multiple Dry Year Demand (including surplus)	<b>110.2</b>	<b>116.2</b>	<b>118.3</b>	<b>110.7</b>	<b>105.1</b>

<sup>[1]</sup> Projected supplies include current supplies and supplies under development, but are limited by MWD's 1.25 MAF allotment to Colorado River Water; data obtained from MWD's September 2005 final draft Regional UWMP.

<sup>[2]</sup> MWD only projects demands for year 3 of a multiple dry year period.

In addition to Metropolitan's Regional UWMP, MWDOC has also prepared a draft 2005 UWMP for the Orange County region and has also held a series of workshops for its member agencies including direct Metropolitan member agencies in Orange County.

<sup>52</sup> Metropolitan Water District of Southern California, Regional UWMP, September 2005 Draft

MWDOC is also looking at the 1922 through 2004 period and has adopted the same average year scenario as Metropolitan; however, they differ in the selection of a single dry year and the multiple dry year scenario. MWDOC has chosen to determine these years based on hydrologic records for Orange County rather than on the State Water Project availability. That methodology has resulted in the selection of 1961 as the single driest year on record and the years 1959 through 1961 as the multiple dry years.

In viewing its entire service area, MWDOC projects single dry year demands that are 105.5 percent of normal and three multiple dry years demands that are 106.7, 103.7 and 105.5 percent of normal. These same factors are representative of all of Orange County and will be applied to project EOCWD's demands in single and multiple dry years.

Table 4.2.1-3 presents population projections within the District's Wholesale Zone service area along with the projected increases in demand in future years for normal, single dry and multiple dry years. The demand projections are predicated on the premise that a specific increase in population does not result in a similar percentage increase in demand. This follows because not all water is used for cooking, drinking and bathing. Even though the population may be increasing, the water demand outside the home (landscaping, commercial, industrial, institutional, etc.) typically increases at a much smaller percentage than the population increase. A good rule of thumb is that the overall increase in demand will be approximately 50 percent of the increase in population. This rule of thumb is consistent with water demand patterns exhibited in mostly built-out areas like EOCWD's service area. This is the premise used in calculating the overall increase in demand reflected in the following tables.

**Table 4.2.1-3  
Wholesale Zone Imported Water Demand  
Summary of Normal Year Population and Demand Projections**

Item	Average Year					
	2005	2010	2015	2020	2025	2030
Projected Population Increase Compared to 2005	0.0%	7.0%	10.9%	13.4%	14.5%	14.9%
Estimated Increase in Water Demand Due to Population Increase Compared with Base Year of 2005	0.0%	3.5%	5.4%	6.7%	7.2%	7.4%

Further specific data for EOCWD is presented in Tables 4.2.1-4 through 4.2.1-10, which compares current and projected water supplies and demands in normal, single dry year and multiple dry year scenarios. These tables reflect only imported water supplies and demands because the Wholesale Zone system is 100 percent reliant on imported supplies

and has no available groundwater. The information presented in these tables is based on the factors previously referenced single and multiple dry year factors developed by MWDOC (i.e., 105% of normal for a single dry year and 106.7%, 103.7% and 105.5% of normal for years 1, 2 and 3 of a multiple dry year period).

In reviewing these tables, it should be noted that future projections are lower in all cases than actual sales in the Fiscal Year 2005 for the following two reasons: (1) the City of Tustin projects substantially lower water purchases than in the past based on the assumption that it will significantly increase its own groundwater production; and (2) 2005 data includes substantial in-lieu purchases (surplus imported water purchases in-lieu of groundwater production).

In the case of in-lieu water purchases, it is also very important to note that such purchases made by EOCWD's retailers (primarily the City of Tustin; however, Southern California Water Company also purchased in-lieu water in 2003-04) are not offset by similar reductions in pumping by EOCWD. They are instead offset by reduction in groundwater pumping by the City of Tustin (or Golden State Water Company). This explains why total water sales by EOCWD in 2005 were 10,515 AF (when Tustin purchased 4,227 AF in-lieu and reduced their pumping by a like amount), but is only projecting between 5,000 and 5,500 AFY of water sales in future years. In other words, in-lieu sales are necessarily included in EOCWD 2005 total imported water figures, but are not reflected in reduced EOCWD groundwater (but rather in reduced groundwater production by the City of Tustin).

**Table 4.2.1-4**  
**EOCWD Wholesale Zone**  
**Projected Water Supply and Demand**  
**Normal Water Year**

(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Supply</b>	<b>Normal Water Years</b>				
Projected Supply During an Average Year as a % of Demand During an Average Year <sup>[1]</sup>	130.8	126.6	133.4	125.5	118.0
Imported <sup>[2]</sup>	6,340	6,280	6,700	6,340	5,970
<b>Total Supply</b>	<b>6,340</b>	<b>6,280</b>	<b>6,700</b>	<b>6,340</b>	<b>5,970</b>
% of normal year <sup>[3]</sup>	100	100	100	100	100
<b>Demand (all import; no groundwater)</b>					
EOCWD Retail Zone	290	300	300	300	310
City of Orange	360	370	380	380	380
City of Tustin	2,400	2,450	2,480	2,490	2,490
Orange Park Acres Mutual	300	310	310	320	320
Golden State Water Company <sup>[4]</sup>	1,500	1,530	1,550	1,560	1,560
Total Imported <sup>[2]</sup>	4,850	4,960	5,020	5,050	5,060
<b>Total Demand</b>	<b>4,850</b>	<b>4,960</b>	<b>5,020</b>	<b>5,050</b>	<b>5,060</b>
% of Year 2005 Demand (10,515 AF) <sup>[5]</sup>	46.1	47.2	47.7	48.0	48.1
<b>Supply/ Demand Difference</b>	<b>1,490</b>	<b>1,320</b>	<b>1,680</b>	<b>1,290</b>	<b>910</b>
<b>Difference as % of Supply</b>	<b>23.5</b>	<b>21.0</b>	<b>25.1</b>	<b>20.3</b>	<b>15.2</b>
<b>Difference as % of Demand</b>	<b>30.7</b>	<b>26.6</b>	<b>33.5</b>	<b>25.5</b>	<b>18.0</b>

[1] From Table 4.2-1, Row I.

[2] Imported water supply = (imported water demand) x (MWD Projected Supply Available During an Average Year as a % of Demand During an Average Year (from Table 4.2-1, Row I); Imported demand = Total Demand. Imported demand assumes base 2005 Year demand of 4,770 AF discounting all in-lieu purchases and assuming the City of Tustin increases its own groundwater production in future years and thereby reduces its purchases from EOCWD.

[3] Normal Year supply is assumed to reflect the total supply available in the row labeled "Total Supply."

[4] Formerly Southern California Water Company.

[5] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.

**Table 4.2.1-5  
EOCWD Wholesale Zone  
Projected Water Supply and Demand  
Single Dry Water Year**

(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Supply</b>	<b>Single Dry Years</b>				
MWD Projected Supply Available During an Average Year as a % of Demand During a Single Dry Year <sup>[1]</sup>	116.3	113	118.8	112.3	106.6
MWD Projected Supply Available During a Single Dry Year as a % of Single Dry Year Demand (including surplus) <sup>[2]</sup>	123.9	131.8	134.3	125.6	119.3
Imported <sup>[3]</sup>	6,010	6,540	6,740	6,340	6,040
<b>Total Supply</b>	<b>6,010</b>	<b>6,540</b>	<b>6,740</b>	<b>6,340</b>	<b>6,040</b>
Normal Year Supply <sup>[4]</sup>	6,340	6,280	6,700	6,340	5,970
% of Normal Year	94.8	104.1	100.6	100.0	101.2
<b>Demand</b>					
EOCWD Retail Zone	310	320	320	320	330
City of Orange	380	390	400	400	400
City of Tustin	2,530	2,580	2,620	2,630	2,630
Orange Park Acres Mutual	320	330	330	340	340
Golden State Water Company	1,580	1,610	1,630	1,640	1,640
Total Imported <sup>[3]</sup>	5,120	5,230	5,300	5,330	5,340
<b>Total Demand<sup>[5]</sup></b>	<b>5,120</b>	<b>5,230</b>	<b>5,300</b>	<b>5,330</b>	<b>5,340</b>
Normal Year Demand <sup>[4]</sup>	4,850	4,960	5,020	5,050	5,060
% of Normal Year Demand	105.6	105.4	105.6	105.5	105.5
% of Year 2005 Demand (10,515 AF)	48.7	49.7	50.4	50.7	50.8
<b>Supply/ Demand Difference</b>	<b>890</b>	<b>1,310</b>	<b>1,440</b>	<b>1,010</b>	<b>700</b>
<b>Difference as % of Supply</b>	<b>14.8</b>	<b>20.0</b>	<b>21.4</b>	<b>15.9</b>	<b>11.6</b>
<b>Difference as % of Demand</b>	<b>17.4</b>	<b>25.0</b>	<b>27.2</b>	<b>18.9</b>	<b>13.1</b>

[1] From Table 4.2-1, Row J

[2] From Table 4.2-1, Row K (includes MWD surplus supplies)

[3] Available Imported supply is estimated to equal MWD's September 2005 Final Draft RUWMP projected available supplies including surplus supplies = (normal year import) x (MWD projected supply as a % of the single dry year demand); Imported demand = normal year demand x 105.5% single dry year demand.

[4] Normal year supplies and demands and taken from Table 4.2-4.

[5] Total Demand = (normal year demand) x (105.5% single dry year demand)

[6] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.



**Table 4.2.1-6**  
**EOCWD Wholesale Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2006-2010**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			98.2	98.2	98.2
Imported <sup>[2]</sup>	6,390	6,380	6,250	6,240	6,230
<b>Total Supply</b>	<b>6,390</b>	<b>6,380</b>	<b>6,250</b>	<b>6,240</b>	<b>6,230</b>
Normal Year Supply <sup>[3]</sup>	6,390	6,380	6,360	6,350	6,340
% of Normal Year	100.0	100.0	98.3	98.3	98.3
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[4]</sup>			116.5	116.5	116.5
EOCWD Retail Zone	290	290	310	300	310
City of Orange	360	360	380	370	380
City of Tustin	2,340	2,350	2,520	2,490	2,530
Orange Park Acres Mutual	300	300	320	310	320
Golden State Water Company	1,500	1,500	1,610	1,550	1,580
Total Imported <sup>[2]</sup>	4,790	4,800	5,140	5,020	5,120
<b>Total Demand</b>	<b>4,790</b>	<b>4,800</b>	<b>5,140</b>	<b>5,020</b>	<b>5,120</b>
Normal Year Demand <sup>[5]</sup>	4,790	4,800	4,820	4,840	4,850
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (10,515 AF) <sup>[6]</sup>	45.6	45.6	48.9	47.7	48.7
<b>Supply/ Demand Difference</b>	<b>1,600</b>	<b>1,580</b>	<b>1,110</b>	<b>1,220</b>	<b>1,110</b>
<b>Difference as % of Supply</b>	<b>25.0</b>	<b>24.8</b>	<b>17.8</b>	<b>19.6</b>	<b>17.8</b>
<b>Difference as % of Demand</b>	<b>33.4</b>	<b>32.9</b>	<b>21.6</b>	<b>24.3</b>	<b>21.7</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-5) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-4.

[3] Interpolated from Table 4.2-4

[4] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3; therefore, Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.5%.

[5] Interpolated from Table 4.2-4; normal year demand for 2006 and 2007 assume base year 2005 demand of 4,770 AF, which in turn assumes no in-lieu purchases by the City of Tustin and greatly increased groundwater production by Tustin thereby resulting in a reduction in imported demand by EOCWD. This is assumption is necessary to project 2010 demands based on Wholesale Zone retailer projected purchases.

[6] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.

**Table 4.2.1-7**  
**EOCWD Wholesale Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2011-2015**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			106.8	106.8	106.8
Imported <sup>[2]</sup>	6,330	6,320	6,730	6,720	6,710
<b>Total Supply</b>	<b>6,330</b>	<b>6,320</b>	<b>6,730</b>	<b>6,720</b>	<b>6,710</b>
Normal Year Supply <sup>[3]</sup>	6,330	6,320	6,300	6,290	6,280
% of Normal Year	100.0	100.0	106.8	106.8	106.8
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[4]</sup>			116.4	116.4	116.4
EOCWD Retail Zone	290	290	320	310	320
City of Orange	360	360	390	380	390
City of Tustin	2,410	2,420	2,600	2,530	2,580
Orange Park Acres Mutual	300	300	330	320	330
Golden State Water Company	1,510	1,520	1,610	1,580	1,610
Total Imported <sup>[2]</sup>	4,870	4,890	5,250	5,120	5,230
<b>Total Demand</b>	<b>4,870</b>	<b>4,890</b>	<b>5,250</b>	<b>5,120</b>	<b>5,230</b>
Normal Year Demand <sup>[5]</sup>	4,870	4,890	4,920	4,940	4,960
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (10,515 AF)	46.3	46.5	49.9	48.7	49.7
<b>Supply/ Demand Difference</b>	<b>1,460</b>	<b>1,430</b>	<b>1,480</b>	<b>1,600</b>	<b>1,480</b>
<b>Difference as % of Supply</b>	<b>23.1</b>	<b>22.6</b>	<b>22.0</b>	<b>23.8</b>	<b>22.1</b>
<b>Difference as % of Demand</b>	<b>30.0</b>	<b>29.2</b>	<b>28.2</b>	<b>31.3</b>	<b>28.3</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-5) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-4.

[3] Interpolated from Table 4.2-4

[4] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3; therefore, Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.4%.

[5] Interpolated from Table 4.2-4

[6] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.

**Table 4.2.1-8**  
**EOCWD Wholesale Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2016-2020**  
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2016	2017	2018	2019	2020
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			103.3	103.3	103.3
Imported <sup>[2]</sup>	6,360	6,450	6,750	6,830	6,920
<b>Total Supply</b>	<b>6,360</b>	<b>6,450</b>	<b>6,750</b>	<b>6,830</b>	<b>6,920</b>
Normal Year Supply <sup>[3]</sup>	6,360	6,450	6,530	6,620	6,700
% of Normal Year	100.0	100.0	103.4	103.2	103.3
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[4]</sup>			116.5	116.5	116.5
EOCWD Retail Zone	300	300	320	310	320
City of Orange	370	370	400	390	400
City of Tustin	2,460	2,470	2,650	2,570	2,620
Orange Park Acres Mutual	310	310	330	320	330
Golden State Water Company	1,530	1,530	1,640	1,610	1,630
Total Imported <sup>[2]</sup>	4,970	4,980	5,340	5,200	5,300
<b>Total Demand</b>	<b>4,970</b>	<b>4,980</b>	<b>5,340</b>	<b>5,200</b>	<b>5,300</b>
Normal Year Demand <sup>[5]</sup>	4,970	4,980	5,000	5,010	5,020
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (10,515 AF)	47.3	47.4	50.8	49.5	50.4
<b>Supply/ Demand Difference</b>	<b>1,390</b>	<b>1,470</b>	<b>1,410</b>	<b>1,630</b>	<b>1,620</b>
<b>Difference as % of Supply</b>	<b>21.9</b>	<b>22.8</b>	<b>20.9</b>	<b>23.9</b>	<b>23.4</b>
<b>Difference as % of Demand</b>	<b>28.0</b>	<b>29.5</b>	<b>26.4</b>	<b>31.3</b>	<b>30.6</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-5) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-4.

[3] Interpolated from Table 4.2-4

[4] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3; therefore, Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.5%.

[5] Interpolated from Table 4.2-4

[6] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.

**Table 4.2.1-9  
EOCWD Wholesale Zone  
Projected Water Supply and Demand  
Multiple Dry Water Years 2021-2025**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			102.4	102.4	102.4
Imported <sup>[2]</sup>	6,630	6,560	6,640	6,570	6,490
<b>Total Supply</b>	<b>6,630</b>	<b>6,560</b>	<b>6,640</b>	<b>6,570</b>	<b>6,490</b>
Normal Year Supply <sup>[3]</sup>	6,630	6,560	6,480	6,410	6,340
% of Normal Year	100.0	100.0	102.5	102.5	102.4
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[4]</sup>			116.0	116.0	116.0
EOCWD Retail Zone	300	300	320	310	320
City of Orange	380	380	400	390	400
City of Tustin	2,490	2,490	2,660	2,590	2,630
Orange Park Acres Mutual	310	310	340	320	340
Golden State Water Company	1,550	1,550	1,660	1,620	1,640
Total Imported <sup>[2]</sup>	5,030	5,030	5,380	5,230	5,320
<b>Total Demand</b>	<b>5,030</b>	<b>5,030</b>	<b>5,380</b>	<b>5,230</b>	<b>5,330</b>
Normal Year Demand <sup>[5]</sup>	5,030	5,030	5,040	5,040	5,050
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (10,515 AF)	47.8	47.8	51.2	49.7	50.7
<b>Supply/ Demand Difference</b>	<b>1,600</b>	<b>1,530</b>	<b>1,260</b>	<b>1,340</b>	<b>1,160</b>
<b>Difference as % of Supply</b>	<b>24.1</b>	<b>23.3</b>	<b>19.0</b>	<b>20.4</b>	<b>17.9</b>
<b>Difference as % of Demand</b>	<b>31.8</b>	<b>30.4</b>	<b>23.4</b>	<b>25.6</b>	<b>21.8</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-5) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-4.

[3] Interpolated from Table 4.2-4

[4] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3; therefore, Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.0%.

[5] Interpolated from Table 4.2-4

[6] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.

**Table 4.2.1-10**  
**EOCWD Wholesale Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2026-2030**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			102.4	102.4	102.4
Imported <sup>[2]</sup>	6,270	6,190	6,260	6,190	6,110
<b>Total Supply</b>	<b>6,270</b>	<b>6,190</b>	<b>6,260</b>	<b>6,190</b>	<b>6,110</b>
Normal Year Supply <sup>[3]</sup>	6,270	6,190	6,120	6,040	5,970
% of Normal Year	100.0	100.0	102.3	102.5	102.3
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[4]</sup>			115.0	115.0	115.0
EOCWD Retail Zone	300	300	330	320	330
City of Orange	380	380	410	390	400
City of Tustin	2,490	2,490	2,660	2,590	2,630
Orange Park Acres Mutual	320	320	340	330	340
Golden State Water Company	1,560	1,560	1,660	1,620	1,640
Total Imported <sup>[2]</sup>	5,050	5,050	5,400	5,250	5,340
<b>Total Demand</b>	<b>5,050</b>	<b>5,050</b>	<b>5,400</b>	<b>5,250</b>	<b>5,340</b>
Normal Year Demand <sup>[5]</sup>	5,050	5,050	5,060	5,060	5,060
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (10,515 AF)	48.0	48.0	51.4	49.9	50.8
<b>Supply/ Demand Difference</b>	<b>1,220</b>	<b>1,140</b>	<b>860</b>	<b>940</b>	<b>770</b>
<b>Difference as % of Supply</b>	<b>19.5</b>	<b>18.4</b>	<b>13.7</b>	<b>15.2</b>	<b>12.6</b>
<b>Difference as % of Demand</b>	<b>24.2</b>	<b>22.6</b>	<b>15.9</b>	<b>17.9</b>	<b>14.4</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-5) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-4.

[3] Interpolated from Table 4.2-4

[4] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3; therefore, Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 115.0%.

[5] Interpolated from Table 4.2-4

[6] Actual 2005 Year Demand was 10,515 AF; however, that amount includes 4,227 AF in in-lieu water purchased by the City of Tustin. The availability of in-lieu water cannot be guaranteed in future years and is therefore not included in normal, single dry year or multiple dry year demand projections. The exclusion of in-lieu water is thus responsible for the unusually low percentages as compared with the 2005 base year demand.

## 4.2.2 EOCWD Retail Service Area

### Retail Service Area Demands

As previously noted, the Retail Zone, which serves a population of less than 4,000 is rather small in comparison to the District's Wholesale Zone service area. Historically, the Retail Zone has pumped the maximum allowable groundwater, i.e., up to the maximum Basin Production Percentage (BPP – currently set at 64 percent by OCWD).

As noted earlier in Table 1.4-5, the Retail Zone Service Area population is projected to increase by about 12.3 percent over the next 25 years. This will result in an estimated 6.1 percent increase in demand as summarized in Table 4.2.2-1. The projected pumping supply, during that same 25 year span is estimated to increase by a like amount coupled with an additional increase based on the assumption that the BPP increases to 70 percent by 2010 (upon completion of the OCWD and OCSD Groundwater Replenishment System Project). The balance of the Retail Zone's water demand (30 percent in future years) will be met through the purchase of imported water from the Wholesale Zone.

**Table 4.2.2-1  
Retail Zone Imported Water Demand  
Summary of Normal Year Population and Demand Projections**

Item	Average Year					
	2005	2010	2015	2020	2025	2030
Projected Population Increase Compared to 2005	0.0%	2.5%	4.9%	7.2%	9.8%	12.3%
Estimated Increase in Water Demand Due to Population Increase	0.0%	1.2%	2.4%	3.6%	4.9%	6.1%

Before proceeding, it is important to establish a foundation to compare future water demand and supply projections against. Table 4.2.2-2 presents actual water demand data for the Retail Zone system for the past six water years and compares it with recorded precipitation over that same period. As noted, demand was down about 10 percent during 2004/05 do to the unusually heavy rainfall which occurred during this period. Due to this anomaly, it is wise not to consider 2004/05 year in the water system reliability analysis. Instead, the five-year average for the period 2000/2004 (1,140 AF rounded) will be used in the analysis.

**Table 4.2.2-2**  
**Retail System Historical Water Demands 2000 – 2005**  
**and Annual Precipitation Data**  
(in AF or Inches of Rain)

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2000/04 Average	2000/05 Average
Water Demand	1,192	1,087	1,137	1,105	1,171	1,026	1,138	1,119
Annual Rainfall in Inches <sup>53</sup>	8.06	14.87	3.82	14.57	8.41	28.44	---	---
Demand as a % of 2000/01 Average Rainfall Year Demand	---	100.0%	104.6%	101.7%	107.7%	---	---	---

As noted in the table, 2000/01 was a fairly normal rainfall year (14.87 inches compared with a long term average of 13.34 inches measured at City of Santa Ana Rainfall Station No. 121. The following three years represent one of the driest three year periods in recent history with 2002/03 being one of the driest years on record in Southern California. Although 2002/03 was fairly normal, 2003/04 was another dry year. Retail Zone water demand during these three years, as a percentage of the 2000/01 average year demand was 104.6, 101.7 and 107.7 percent. This follows the same three year dry trend developed by MWDOC based on 82 years of hydrologic data, i.e., the first, second and third years being 106.7, 103.7 and 105.5 percent of normal. Given that MWDOC's data is based on a longer study period (1922-2004) and is representative of the entire County of Orange, its dry year factors will be used in the Retail Zone Water Reliability Analysis for single and multiple dry years. That analysis is presented in Tables 4.2.2-3 through 4.2.2-9, which compare current and projected water supplies and demands for the Retail Zone in normal, single dry year and multiple dry year scenarios.

<sup>53</sup> 2000 through 2003 data from [www.ocgov.com/pfrd/envres/Rainfall/hydrorports.asp](http://www.ocgov.com/pfrd/envres/Rainfall/hydrorports.asp) and 2004 data from [www.ci.santa-ana.ca.us/facts/default.htm](http://www.ci.santa-ana.ca.us/facts/default.htm) Data is from Santa Ana Rainfall Station 121; Average annual rainfall at this station for the period 1964 through 2003 is 13.34 inches.

**Table 4.2.2-3  
EOCWD Retail Zone  
Projected Water Supply and Demand  
Normal Water Year  
(AFY – All projections rounded to nearest 10 AF)**

<b>Water Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Supply</b>	<b>Normal Water Years</b>				
MWD Projected Supply During an Average Year as a % of Demand During an Average Year <sup>[1]</sup>	130.8	126.6	133.4	125.5	118.0
Imported <sup>[2]</sup>	460	440	480	450	440
Local (Groundwater) <sup>[3]</sup>	820	830	840	850	860
<b>Total Supply</b>	<b>1,280</b>	<b>1,270</b>	<b>1,320</b>	<b>1,300</b>	<b>1,300</b>
% of Normal Year <sup>[4]</sup>	100	100	100	100	100
<b>Demand</b>					
Imported <sup>[2]</sup>	350	350	360	360	370
Local (Groundwater) <sup>[3]</sup>	820	830	840	850	860
<b>Total Demand<sup>[5]</sup></b>	<b>1,170</b>	<b>1,180</b>	<b>1,200</b>	<b>1,210</b>	<b>1,230</b>
% of Year 2005 Demand (1,140 AF) <sup>[6]</sup>	102.6	103.5	105.3	106.1	107.9
<b>Supply/ Demand Difference</b>	<b>110</b>	<b>90</b>	<b>120</b>	<b>90</b>	<b>70</b>
<b>Difference as % of Supply</b>	<b>8.6</b>	<b>7.1</b>	<b>9.1</b>	<b>6.9</b>	<b>5.4</b>
<b>Difference as % of Demand</b>	<b>9.4</b>	<b>7.6</b>	<b>10.0</b>	<b>7.4</b>	<b>5.7</b>

[1] From Table 4.2-1, Row I.

[2] Imported water supply = (imported water demand) x (MWD Projected Supply Available During an Average Year as a % of Demand During an Average Year (from Table 4.2-1, Row I); Imported demand = Total Demand – Local Groundwater) demand.

[3] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[4] Normal Year supply is assumed to reflect the total supply available in the row labeled "Total Supply."

[5] Total demand during normal years is based on projected increases reflected in Table 4.2.2-1.

[6] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.



**Table 4.2.2-4**  
**EOCWD Retail Zone**  
**Projected Water Supply and Demand**  
**Single Dry Water Year**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Supply</b>	<b>Single Dry Years</b>				
MWD Projected Supply Available During an Average Year as a % of Demand During a Single Dry Year <sup>[1]</sup>	116.3	113	118.8	112.3	106.6
MWD Projected Supply Available During a Single Dry Year as a % of Single Dry Year Demand (including surplus) <sup>[2]</sup>	123.9	131.8	134.3	125.6	119.3
Imported <sup>[3]</sup>	430	460	480	450	440
Local (Groundwater) <sup>[4]</sup>	860	870	890	900	910
<b>Total Supply</b>	<b>1,290</b>	<b>1,330</b>	<b>1,370</b>	<b>1,350</b>	<b>1,350</b>
Normal Year Supply <sup>[5]</sup>	1,280	1,270	1,320	1,300	1,300
% of Normal Year	100.8	104.7	103.8	103.8	103.8
<b>Demand</b>					
Imported <sup>[3]</sup>	370	370	380	380	390
Local (Groundwater) <sup>[4]</sup>	860	870	890	900	910
<b>Total Demand<sup>[6]</sup></b>	<b>1,230</b>	<b>1,240</b>	<b>1,270</b>	<b>1,280</b>	<b>1,300</b>
Normal Year Demand <sup>[5]</sup>	1,170	1,180	1,200	1,210	1,230
% of Normal Year Demand	105.1	105.1	105.8	105.8	105.7
% of Year 2005 Demand (1,140 AF) <sup>[7]</sup>	107.9	108.8	111.4	112.3	114.0
<b>Supply/ Demand Difference</b>	<b>60</b>	<b>90</b>	<b>100</b>	<b>70</b>	<b>50</b>
<b>Difference as % of Supply</b>	<b>4.7</b>	<b>6.8</b>	<b>7.3</b>	<b>5.2</b>	<b>3.7</b>
<b>Difference as % of Demand</b>	<b>4.9</b>	<b>7.3</b>	<b>7.9</b>	<b>5.5</b>	<b>3.8</b>

[1] From Table 4.2-1, Row J

[2] From Table 4.2-1, Row K (includes MWD surplus supplies)

[3] Available Imported supply is estimated to equal MWD's September 2005 Final Draft RUWMP projected available supplies including surplus supplies = (normal year import) x (MWD projected supply as a % of the single dry year demand); Imported demand = normal year demand x 105.5% single dry year demand.

[4] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[5] Normal year supplies and demands and taken from Table 4.2.2-3.

[6] Total Demand = (normal year demand) x (105.5% single dry year demand)

[7] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.

**Table 4.2.2-5  
EOCWD Retail Zone  
Projected Water Supply and Demand  
Multiple Dry Water Years 2006-2010**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			98.2	98.2	98.2
Imported <sup>[2]</sup>	550	550	490	470	450
Local (Groundwater) <sup>[3]</sup>	740	740	870	840	860
<b>Total Supply</b>	<b>1,290</b>	<b>1,290</b>	<b>1,360</b>	<b>1,310</b>	<b>1,310</b>
Normal Year Supply <sup>[4]</sup>	1,290	1,290	1,280	1,280	1,280
% of Normal Year	100.0	100.0	106.3	102.3	102.3
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[5]</sup>			116.5	116.5	116.5
Imported <sup>[2]</sup>	410	410	370	360	370
Local (Groundwater) <sup>[3]</sup>	740	740	870	840	860
<b>Total Demand<sup>[6]</sup></b>	<b>1,150</b>	<b>1,150</b>	<b>1,240</b>	<b>1,200</b>	<b>1,230</b>
Normal Year Demand <sup>[7]</sup>	1,150	1,150	1,160	1,160	1,170
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (1,140 AF) <sup>[8]</sup>	100.9	100.9	108.8	105.3	107.9
<b>Supply/ Demand Difference</b>	<b>140</b>	<b>140</b>	<b>120</b>	<b>110</b>	<b>80</b>
<b>Difference as % of Supply</b>	<b>10.9</b>	<b>10.9</b>	<b>8.8</b>	<b>8.4</b>	<b>6.1</b>
<b>Difference as % of Demand</b>	<b>12.2</b>	<b>12.2</b>	<b>9.7</b>	<b>9.2</b>	<b>6.5</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-3) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors determined from historical records. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-3.

[3] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[4] Interpolated from Table 4.2-3

[5] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.5%.

[6] Total demand for first two years is normal demand; total demand for last three years is normal demand multiplied by 106.7%, 103.7% and 105.5% multiple dry year factors for Years 1, 2 and 3.

[7] Interpolated from Table 4.2-3

[8] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.

**Table 4.2.2-6**  
**EOCWD Retail Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2011-2015**  
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2011	2012	2013	2014	2015
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			106.8	106.8	106.8
Imported <sup>[2]</sup>	460	450	480	470	470
Local (Groundwater) <sup>[3]</sup>	820	820	880	850	870
<b>Total Supply</b>	<b>1,280</b>	<b>1,270</b>	<b>1,360</b>	<b>1,320</b>	<b>1,340</b>
Normal Year Supply <sup>[4]</sup>	1,280	1,280	1,270	1,270	1,270
% of Normal Year	100.0	99.2	107.1	103.9	105.5
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[5]</sup>			116.4	116.4	116.4
Imported <sup>[2]</sup>	350	350	380	370	370
Local (Groundwater) <sup>[3]</sup>	820	820	880	850	870
<b>Total Demand<sup>[6]</sup></b>	<b>1,170</b>	<b>1,170</b>	<b>1,260</b>	<b>1,220</b>	<b>1,240</b>
Normal Year Demand <sup>[7]</sup>	1,170	1,170	1,180	1,180	1,180
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (1,140 AF) <sup>[8]</sup>	102.6	102.6	110.5	107.0	108.8
<b>Supply/ Demand Difference</b>	<b>110</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Difference as % of Supply</b>	<b>8.6</b>	<b>7.9</b>	<b>7.4</b>	<b>7.6</b>	<b>7.5</b>
<b>Difference as % of Demand</b>	<b>9.4</b>	<b>8.5</b>	<b>7.9</b>	<b>8.2</b>	<b>8.1</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-3) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors determined from historical records. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-3.

[3] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[4] Interpolated from Table 4.2-3

[5] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.4%.

[6] Total demand for first two years is normal demand; total demand for last three years is normal demand multiplied by 106.7%, 103.7% and 105.5% multiple dry year factors for Years 1, 2 and 3.

[7] Interpolated from Table 4.2-3

[8] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.

**Table 4.2.2-7**  
**EOCWD Retail Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2016-2020**  
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2016	2017	2018	2019	2020
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			103.3	103.3	103.3
Imported <sup>[2]</sup>	450	460	480	490	500
Local (Groundwater) <sup>[3]</sup>	830	830	890	870	890
<b>Total Supply</b>	<b>1,280</b>	<b>1,290</b>	<b>1,370</b>	<b>1,360</b>	<b>1,390</b>
Normal Year Supply <sup>[4]</sup>	1,280	1,290	1,300	1,310	1,320
% of Normal Year	100.0	100.0	105.4	103.8	105.3
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[5]</sup>			116.5	116.5	116.5
Imported <sup>[2]</sup>	350	360	380	370	380
Local (Groundwater) <sup>[3]</sup>	830	830	890	870	890
<b>Total Demand<sup>[6]</sup></b>	<b>1,180</b>	<b>1,190</b>	<b>1,270</b>	<b>1,240</b>	<b>1,270</b>
Normal Year Demand <sup>[7]</sup>	1,180	1,190	1,190	1,200	1,200
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (1,140 AF) <sup>[8]</sup>	103.5	104.4	111.4	108.8	111.4
<b>Supply/ Demand Difference</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>120</b>	<b>120</b>
<b>Difference as % of Supply</b>	<b>7.8</b>	<b>7.8</b>	<b>7.3</b>	<b>8.8</b>	<b>8.6</b>
<b>Difference as % of Demand</b>	<b>8.5</b>	<b>8.4</b>	<b>7.9</b>	<b>9.7</b>	<b>9.4</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-3) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors determined from historical records. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-3.

[3] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[4] Interpolated from Table 4.2-3

[5] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.5%.

[6] Total demand for first two years is normal demand; total demand for last three years is normal demand multiplied by 106.7%, 103.7% and 105.5% multiple dry year factors for Years 1, 2 and 3.

[7] Interpolated from Table 4.2-3

[8] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.

**Table 4.2.2-8**  
**EOCWD Retail Zone**  
**Projected Water Supply and Demand**  
**Multiple Dry Water Years 2021-2025**  
(AFY – All projections rounded to nearest 10 AF)

<b>Water Sources</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			102.4	102.4	102.4
Imported <sup>[2]</sup>	470	470	470	470	460
Local (Groundwater) <sup>[3]</sup>	840	840	900	880	900
<b>Total Supply</b>	<b>1,310</b>	<b>1,310</b>	<b>1,370</b>	<b>1,350</b>	<b>1,360</b>
Normal Year Supply <sup>[4]</sup>	1,320	1,310	1,310	1,300	1,300
% of Normal Year	99.2	100.0	104.6	103.8	104.6
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[5]</sup>			116.0	116.0	116.0
Imported <sup>[2]</sup>	360	360	390	370	380
Local (Groundwater) <sup>[3]</sup>	840	840	900	880	900
<b>Total Demand<sup>[6]</sup></b>	<b>1,200</b>	<b>1,200</b>	<b>1,290</b>	<b>1,250</b>	<b>1,280</b>
Normal Year Demand <sup>[7]</sup>	1,200	1,200	1,210	1,210	1,210
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (1,140 AF) <sup>[8]</sup>	105.3	105.3	113.2	109.6	112.3
<b>Supply/ Demand Difference</b>	<b>110</b>	<b>110</b>	<b>80</b>	<b>100</b>	<b>80</b>
<b>Difference as % of Supply</b>	<b>8.4</b>	<b>8.4</b>	<b>5.8</b>	<b>7.4</b>	<b>5.9</b>
<b>Difference as % of Demand</b>	<b>9.2</b>	<b>9.2</b>	<b>6.2</b>	<b>8.0</b>	<b>6.3</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-3) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors determined from historical records. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-3.

[3] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[4] Interpolated from Table 4.2-3

[5] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 116.0%.

[6] Total demand for first two years is normal demand; total demand for last three years is normal demand multiplied by 106.7%, 103.7% and 105.5% multiple dry year factors for Years 1, 2 and 3.

[7] Interpolated from Table 4.2-3

[8] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.

**Table 4.2.2-9  
EOCWD Retail Zone  
Projected Water Supply and Demand  
Multiple Dry Water Years 2026-2030**  
(AFY – All projections rounded to nearest 10 AF)

Water Sources	2026	2027	2028	2029	2030
<b>Supply</b>	<b>Normal Years</b>		<b>Dry Years</b>		
MWD Projected Supply During a Multiple Dry Year as a % of Average Supply <sup>[1]</sup>			102.4	102.4	102.4
Imported <sup>[2]</sup>	450	450	450	450	450
Local (Groundwater) <sup>[3]</sup>	850	850	910	900	910
<b>Total Supply</b>	<b>1,300</b>	<b>1,300</b>	<b>1,360</b>	<b>1,350</b>	<b>1,360</b>
Normal Year Supply <sup>[4]</sup>	1,300	1,300	1,300	1,300	1,300
% of Normal Year	100.0	100.0	104.6	103.8	104.6
<b>Demand</b>					
MWD Projected Multiple Dry Year Demand as % of Normal Year <sup>[5]</sup>			115.0	115.0	115.0
Imported <sup>[2]</sup>	360	370	390	380	390
Local (Groundwater) <sup>[3]</sup>	850	850	910	900	910
<b>Total Demand<sup>[6]</sup></b>	<b>1,210</b>	<b>1,220</b>	<b>1,300</b>	<b>1,280</b>	<b>1,300</b>
Normal Year Demand <sup>[7]</sup>	1,210	1,220	1,220	1,230	1,230
% of Normal Year Demand	100.0	100.0	106.7	103.7	105.5
% of Year 2005 Demand (1,140 AF) <sup>[8]</sup>	106.1	107.0	114.0	112.3	114.0
<b>Supply/ Demand Difference</b>	<b>90</b>	<b>80</b>	<b>60</b>	<b>70</b>	<b>60</b>
<b>Difference as % of Supply</b>	<b>6.9</b>	<b>6.2</b>	<b>4.4</b>	<b>5.2</b>	<b>4.4</b>
<b>Difference as % of Demand</b>	<b>7.4</b>	<b>6.6</b>	<b>4.6</b>	<b>5.5</b>	<b>4.6</b>

[1] From Table 4.2-2, Row C

[2] Imported supply = (imported supply interpolated from Table 4.2-3) x (escalation factor from Table 4.2-2, Row C); Imported demand = (normal year demand) x (106.7%, 103.7% or 105.5% Year 1, 2 and 3 multiple dry year demand factors determined from historical records. Imported demand for normal years is 100% of normal demand interpolated from Table 4.2-3.

[3] Groundwater demand is estimated to comprise 70% of the total potable demand based on a BPP of 70%; groundwater supply is estimated to equal demand.

[4] Interpolated from Table 4.2-3

[5] From Table 4.2-2, Row F; In its September 2005 Draft UWMP Multiple Dry Year Projections, MWD only projected demands for Year 3, therefore Years 1 and 2 are assumed to equal Year 3 demand; these percentages are presented only to reflect the fact that the City's demand is well below the factor presented in the table, e.g., 2010 multiple dry year demand is 105.5% as opposed to 115.0%.

[6] Total demand for first two years is normal demand; total demand for last three years is normal demand multiplied by 106.7%, 103.7% and 105.5% multiple dry year factors for Years 1, 2 and 3.

[7] Interpolated from Table 4.2-3

[8] 2005 Demand was substantially below normal due to the record rainfall in Southern California and its impact on water demand; the average demand over the prior five years (1,140 AF) is therefore used in this analysis because it is more representative of typical water demands in the Retail System.

### **4.3 VULNERABILITY OF SUPPLY FOR SEASONAL OR CLIMATIC SHORTAGE**

As noted in Section 1.4.1, the District's service area climate is semi-arid environment with mild winters, warm summers and moderate rainfall, consistent with coastal Southern California. The area's average annual temperature is 62 degrees Fahrenheit and the average annual rainfall is 12.8 inches.

Climatological data in California has been recorded since the year 1858. During the twentieth century, California has experienced three periods of severe drought: 1928-34, 1976-77 and 1987-91. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by the DWR. These rivers flow into the San Francisco Bay Delta and are the source of water for the State Water Project.

Southern California and, in particular, Orange County sustained few adverse impacts from the 1976-77 drought, due in large part to the availability of Colorado River water and groundwater stored in the Santa Ana Basin. But the 1987-91 drought created considerably more concern for Southern California and Orange County.

As a result, the District is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. While the data shown in Tables 4.2.1-4/10 and 4.2.2-3/9 identify water availability during single and multiple dry year scenarios, response to a future drought would follow the water use efficiency mandates of MWDOC and its support of the Metropolitan Water Surplus and Drought Management (WSDM) Plan along with implementation of the appropriate stage of the District's Water Conservation Program. These programs are more specifically discussed in Section 7.

### **4.4 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS TO MEET PROJECTED WATER USE**

EOCWD performs routine maintenance and operations in a manner that ensures water system reliability in both its wholesale and retail zones. Moreover, the District relies on the facilities and water delivery of Metropolitan and the OCWD. Therefore, the purchased imported water from the State Water Project and the Colorado River through Metropolitan's member agency MWDOC, the projects implemented by Metropolitan and MWDOC to secure their water supplies has a direct affect on the District. In addition, OCWD's planned projects and programs for groundwater and recycled water will also impact the District.

**EOCWD WHOLESALE ZONE**

**Metropolitan Water District of Southern California (Metropolitan) Projects**

Metropolitan is implementing water supply alternative strategies for the region and on behalf of their member agencies to insure available water in the future. Some of the strategies identified in Metropolitan’s 2005 UWMP include:

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

Metropolitan has made investments in conservation, water recycling, storage, and supply that are all part of Metropolitan’s long-term water management strategy. Metropolitan’s approach to a long-term water management strategy was to develop an Integrated Resource Plan that depended on many sources of supply. Metropolitan’s implementation approach for achieving the goals of the Integrated Resource Plan Update is summarized in Table 4.4-1. A comprehensive description of Metropolitan's implementation approach is contained in their 2003 report on Metropolitan water supplies "A Blueprint for Water Reliability" as well as their 2005 Regional Urban Water Management Plan. A brief description of the various programs implemented by Metropolitan is also included following Table 4.4-1.

**Table 4.4-1  
Metropolitan Integrated Resource Plan Update Resources Status**

Target	Programs and Status
<ul style="list-style-type: none"> <li>• <b>Conservation</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- Conservation Credits Program</li> <li>- 1992 Plumbing Codes</li> <li>- Southern California Heritage Landscape Program</li> </ul> <p><b>In Development or Identified</b></p> <ul style="list-style-type: none"> <li>- Innovative Conservation Program</li> <li>- Innovative Supply Program</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Recycling</b></li> <li>• <b>GW Recovery</b></li> <li>• <b>Desalination</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- LRP Program</li> </ul> <p><b>In Development or Identified</b></p> <ul style="list-style-type: none"> <li>- Additional LRP Requests for Proposals</li> <li>- Seawater Desalination Program</li> </ul>
<ul style="list-style-type: none"> <li>• <b>In Region Dry-Year Surface Water Storage</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- Diamond Valley Reservoir, Lake Mathews, Lake Skinner</li> <li>- SWP Terminal Reservoirs (Monterey Agreement)</li> </ul>



Target	Programs and Status
<ul style="list-style-type: none"> <li>• <b>In Region Groundwater Conjunctive Use</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- North Las Posas (Eastern Ventura County)</li> <li>- Cyclic Storage</li> <li>- Replenishment Deliveries</li> <li>- Proposition 13 Programs (short listed)</li> </ul> <p><b>In Development or Identified</b></p> <ul style="list-style-type: none"> <li>- Raymond Basin GSP</li> <li>- Proposition 13 Programs (wait listed)</li> <li>- Expanding existing programs</li> <li>- New groundwater storage programs</li> </ul>
<ul style="list-style-type: none"> <li>• <b>SWP</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- SWP Deliveries</li> <li>- San Luis Carryover Storage (Monterey Agreement)</li> <li>- Environmental Water Account</li> </ul> <p><b>In Development or Identified</b></p> <ul style="list-style-type: none"> <li>- Sacramento Valley Water Management Agreement</li> <li>- CALFED Delta Improvement Program</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Colorado River Aqueduct</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- Base Apportionment</li> <li>- IID/Metropolitan Conservation Program</li> <li>- Coachella and All American Canal Lining Programs</li> <li>- Hayfield Storage Program</li> <li>- PVID Land Management Program</li> </ul> <p><b>In Development or Identified</b></p> <ul style="list-style-type: none"> <li>- Lower Coachella Storage Program</li> <li>- Chuckwalla Storage Program</li> <li>- Central Arizona Banking Program</li> <li>- QSA Programs &amp; Interim Surplus Guidelines</li> </ul>
<ul style="list-style-type: none"> <li>• <b>CVP/SWP Storage and Transfers</b></li> <li>• <b>Spot Transfers and Options</b></li> </ul>	<p><b>Current</b></p> <ul style="list-style-type: none"> <li>- Arvin Edison Program</li> <li>- Semitropic Program</li> <li>- San Bernardino Valley MWD Program</li> <li>- Kern Delta Program</li> <li>- Desert Water/Coachella Valley Advanced Storage</li> <li>- Spot Market transfers and options</li> <li>- Mojave Storage Demonstration Project</li> <li>- North Kern Storage Program (pilot)</li> </ul> <p><b>In Development or Identified</b></p> <ul style="list-style-type: none"> <li>- San Bernardino Valley MWD Conjunctive Use Program</li> <li>- Kern Water Banking Program</li> <li>- Other San Joaquin Valley Programs</li> </ul>

**Conservation Target**

Metropolitan’s conservation policies and practices are shaped by Metropolitan’s Integrated Resource Plan and the California Urban Water Conservation Council *Memorandum of Understanding Regarding Water Conservation in California*.

### ***Recycled Water Target***

Currently, 355 thousand acre feet (TAF) of recycled water is permitted for use within Metropolitan service area.<sup>54</sup> Metropolitan estimates that an additional 480 TAF per year of new recycled water could be developed and used by 2025 with an additional 130 TAF per year by 2050. Metropolitan reports that a number of these projects are currently being implemented while others are still in the planning phases of development. Approximately 30 percent of the recycled water use within Metropolitan's service area is for groundwater replenishment and seawater barriers. In the future it is anticipated that up to 90 percent of all water used for seawater barriers will be recycled water.

Metropolitan recognizes the importance of member agencies developing local supplies and has implemented several programs to provide financial assistance. Metropolitan's incentive programs include:

- **Competitive Local Resources Program:** Supports the development of cost-effective water recycling and groundwater recovery projects that reduce demands for imported supplies
- **Seawater Desalination Program:** Supports the development of seawater desalination within Metropolitan's service area

According to Metropolitan's 2005 UWMP, 13 projects were selected in 2004 for implementation under the Competitive Local Resources Program. None of the projects are within the District's service area; however two projects are proposed under MWDOC. The projects include the Groundwater Replenishment System and a recycled water upgrade within Irvine Ranch Water District's service area. The Groundwater Replenishment System is discussed as a planned project under OCWD.

### ***Regional Groundwater Conjunctive Use Target***

Other programs within Metropolitan to maximize water supplies include storage and groundwater management programs. The IRP Update identified the need for dry-year storage within surface water reservoirs and the need for groundwater storage. In 2002, Diamond Valley Lake reached its full storage capacity of 800,000 AF. Approximately 400,000 AF are dedicated for dry-year storage. Metropolitan has developed a number of local programs to increase storage in the groundwater basins. The programs include:

- **North Las Posas –** In 1995, Metropolitan and Calleguas Municipal Water District developed facilities for groundwater storage and extraction from the North Las Posas Basin. Metropolitan has the right to store up to 210,000 AF of water. The well fields are expected to fully operational in 2006 with Phases I and II already complete. It is expected the North Las Posas program will yield 70,000 AF of groundwater from the basin each year.
- **Proposition 13 Projects –** In 2000, DWR selected Metropolitan to receive financial funding to help fund the Southern California Water Supply Reliability

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<sup>54</sup> Metropolitan Water District of Southern California, Regional UWMP, Draft September 2005

Projects Program. The program coordinates eight conjunctive use projects with a total storage capacity of 195 TAF and a dry-year yield of 65 TAF per year. One of the projects selected through the request for proposals for Proposition 13 funding includes the Orange County Groundwater Conjunctive Use Program. This program was submitted by OCWD and MWDOC and is detailed.

- Raymond Basin – In January 2000, Metropolitan entered into agreements with the City of Pasadena and Foothill Municipal Water District to implement a groundwater storage program that is anticipated to yield 25 TAF per year by 2010.
- Other Programs – Metropolitan intends to expand the conjunctive use programs to add another 111 TAF to groundwater storage. To date, Metropolitan has identified two projects, the Elsinore Valley Groundwater Storage Program and the San Gabriel Basin Conjunctive Use Project, which could supply 27 TAF of dry-year supply. Other basins in the area are being evaluated for possible conjunctive use projects.

#### ***State Water Project Target***

The major actions Metropolitan is completing to improve SWP reliability include the following:

- Delta Improvements Package – The actions outlined in this package are related to water project operations in the Delta. The actions are designed to allow the SWP to operate the Banks Pumping Plant in the Delta at 8,500 CFS. Currently Banks Pumping Plant operates at 6,680 CFS. Metropolitan anticipates that increase diversion from the Delta will result in an increase of 72 TAF per year will be available for groundwater and surface water storage (96 TAF to 168 TAF).
- Phase 8 Settlement – This agreement includes various recommended water supply projects that meet demand and water quality objectives within the Sacramento Valley. The various conjunctive use projects will yield approximately 185 TAF per year in the Sacramento Valley of which approximately 45 TAF would be available to Metropolitan through its SWP allocation.
- Monterey Amendment – The Monterey Amendment enables Metropolitan to use a portion of the San Luis Reservoir's capacity for carryover storage. This will increase SWP delivery to Metropolitan to 200 TAF (an increase of 75 TAF).
- SWP Terminal Storage – Metropolitan has water rights for storage at Lake Perris and Castaic Lake. The storage provides Metropolitan with options for managing SWP deliveries and store up to 220 TAF of carryover water.

#### ***Colorado River Aqueduct Target***

Metropolitan also receives imported water from the Colorado River Aqueduct. Metropolitan, Imperial Irrigation District (IID) and Coachella Valley Water District executed the Quantification Settlement Agreement (QSA) in October 2003. The QSA

established the baseline water use for each agency and facilitated the transfer agricultural water to urban uses. A number of programs have been identified to assist Metropolitan meet their target goal of 1.2 MAF per year from the Colorado River Aqueduct. These programs include the following:

- Imperial Irrigation District/Metropolitan Conservation Program – The program originally provided funding from Metropolitan to implement water efficiency improvements within IID. Metropolitan in turn would reserve the right to divert the water conserved by those investments. Execution of the QSA extended the term of the program to 2078 and guaranteed Metropolitan at least 80 TAF per year.
- Coachella and All-American Canal Lining Project – The Coachella Canal Lining Project is scheduled to be completed in January 2007 and is expected to conserve 26,000 AFY. The All-American Canal Lining Project is scheduled to be completed in 2008 and is expected to conserve 67,700 AFY. The conserved water will be made available in Lake Havasu for diversion from Metropolitan. In exchange, Metropolitan will supply a like amount to the San Luis Rey Settlement Parties and San Diego County Water Authority.
- IID/San Diego County Water Authority Transfer – IID has agreed to implement a conservation program and transfer water to San Diego County Water Authority. The transfer began in 2003 with 10 TAF and will increase yearly until 2023 where the transfer will be 200 TAF annually. Water will be conserved through land fallowing and irrigation efficiency measures. Metropolitan will supply the water conserved to San Diego County Water Authority in exchange for a like amount out of Lake Havasu.
- Palo Verde Land Management and Crop Rotation Program – This program offers financial incentives to farmers with Palo Verde Irrigation District to not irrigate a portion of their land. A maximum of 29 percent of lands within Palo Verde Irrigation District can be fallowed in any year. The water conserved will be available to Metropolitan with a maximum of 111 TAF per year expected.
- Hayfield Groundwater Storage Program – Metropolitan will divert Colorado River water and store it in the Hayfield Groundwater Basin in east Riverside County. Currently there is 72 TAF of water in storage. Metropolitan expects the program to eventually develop a storage capacity of approximately 500 TAF.
- Chuckwalla Groundwater Storage Program – Metropolitan proposes to store water when available in the Upper Chuckwalla Groundwater Basin for future delivery to Metropolitan.
- Lower Coachella Valley Groundwater Storage Program – Metropolitan, Coachella Valley Water District, and the Desert Water Agency are investigating the feasibility of a conjunctive use program in the Lower Coachella Groundwater Basin. The basin has the potential to store 500 TAF of groundwater for Metropolitan.

### ***CVP/SWP Storage and Transfers Target***

Metropolitan has focused on voluntary short and long-term transfer and storage programs with CVP and other SWP contractors. Currently, Metropolitan has enough transfer and storage programs to meet their 2010 target goal of 300 TAF. Metropolitan has eight CVP/SWP transfer and storage programs in place for a total of 396,200 AF of dry-year supply. Metropolitan also anticipates another three programs under development that will provide an additional 125,000 AF of dry-year supply. The operational programs include the following:

- Semitropic – 107,000 AF dry-year supply
- Arvin-Edison – 90,000 AF dry-year supply
- San Bernardino Valley Municipal Water District – 70,000 AF dry-year supply
- Kern Delta Water District – 50,000 AF dry-year supply
- Desert Water Agency/Coachella Valley Water District – 14,200 AF dry-year supply
- Mojave Storage Program – 35,000 AF dry-year supply
- North Kern Storage Program – 30,000 AF dry-year supply

### ***Municipal Water District of Orange County (MWDOC) Projects***

Sufficient water storage programs will help to ensure adequate water supplies in the future and in time of drought. The need for local storage intensifies with Southern California's and the Orange County region's dependence on imported water to serve water demands. One of the most effective forms of storage in a highly dry and arid climate is conjunctive use wherein water is stored under ground during wet periods and pumped out during dry or drought periods.

The MWDOC 2005 Regional Urban Water Management Plan discusses a number of water supply opportunities in Orange County, including the Groundwater Replenishment System, to protect and maximize the yield of the basin.

### ***Orange County Groundwater Conjunctive Use Program***

As discussed above, the Orange County Groundwater Conjunctive Use Program was selected by Metropolitan in June 2003, funded by Proposition 13, to construct groundwater conjunctive use projects that would store imported water in wet years for use in dry years. This is a 25-year project between MWDOC, OCWD, and Metropolitan to store up to 60,000 AF of imported water in the Orange County groundwater basin for this purpose, extracting up to 20,000 AF of water during dry periods from 7-10 strategically sited wells. The wells will be used to pump in excess of the existing pumping demand when needed.

Although the District is not participating in this program, the additional wells would reduce the region's dependence on imported water during dry periods and would provide greater reliability.

### **Orange County Water District (OCWD) Projects**

OCWD is dedicated to maintaining a reliable supply of water for its groundwater users. OCWD has identified reliability measures to help mitigate emergency water shortages or increase water supply, including the following:

- OCWD has an agreement with San Bernardino Valley Municipal Water District (SBVMWD) to purchase groundwater supplies. SBVMWD's groundwater table is very high, making excess supply available for pumping to the Santa Ana River for OCWD's use.
- OCWD continues to discuss the purchase of non-SWP water supplies via SBVMWD's capacity in the SWP system.
- OCWD previously entered into a one-year contract with Western Water Company to purchase water from Northern California and plans to continue with similar contracts in the future.
- Wheeled water supplies are available for purchase through Metropolitan.
- Facilities to capture greater amounts of Santa Ana River Storm flows are being proposed and constructed such as recharge basins on a La Jolla Street property and the Lakeview Pipeline Project.
- OCWD continues to work with the Army Corps of Engineers to allow an increase in the water conservation pool level behind Prado Dam. An increase in the conservation pool level allows more storage of storm flows for later use as recharge water.
- OCWD plans improvements to the Talbert Barrier including the construction of the West End Improvement Project consisting of six injection wells and 4,500 linear feet of pipeline.

### **Orange County Sanitation Districts (OCS) Projects**

As mentioned earlier, OCS supplies treated wastewater to OCWD for further treatment. OCWD relies on recycled water from OCS's treatment facilities to protect the Basin through seawater intrusion barriers and landscape irrigation. OCS in conjunction with OCWD have implemented the GWRS, beginning in October 2002 with OCWD and OCS signing a Joint Exercise of Powers Agreement for the GWRS. The first phase is currently underway, which will treat wastewater to drinking water standards for direct injection into the existing seawater intrusion barrier and percolation through recharge basins in Anaheim, California.<sup>55</sup> The project is scheduled to go online in 2007 and will maintain and improve the reliability of the region's water supply. Further discussion on water recycling is included in Section 8 of this Plan.

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<sup>55</sup> Orange County Water District, *Draft 2002-2003 Engineer's Report on Groundwater conditions, Water Supply and Basin Utilization in the Orange County Water District*, February 2004

## **EOCWD RETAIL ZONE**

The District's East and West Retail Zone Wells are 58 and 79 years old respectively. Although both wells are currently performing to expectations, District staff has begun the planning process to replace one or both of them when necessary.

Wells 58 and 79 are the Retail Zone's only wells and only means for groundwater. Inclusion of replacement of these wells in the District's Capital Improvement Program is wise to ensure reliability of future supplies.

### **4.5 TRANSFER AND EXCHANGE OPPORTUNITIES**

The District maintains three connections to the Metropolitan system. The District also maintains two interconnections with the City of Orange. One is located at the District's McPherson Street headquarters (site of the East and West Wells) and the second one is located on Chandler Ranch Road in Orange.

The District has not entered into any agreements for transfer or exchange of water. However, Metropolitan, MWDOC, and OCWD are exploring options that would benefit the entire Orange County region. These exchanges were discussed earlier under proposed projects.

### **4.6 DESALINATED WATER OPPORTUNITIES**

Desalination is viewed as a way to develop a local, reliable source of water that assists agencies reduce their demand on imported water, reduce groundwater overdraft, and in some cases make unusable groundwater available for municipal uses. Currently, there are no identified projects within EOCWD for desalination of seawater or impaired groundwater. However, from a regional perspective, desalination projects within the region may some day indirectly benefit the District, if they are cost-effective.

#### ***Department of Water Resources Desalination Task Force***

Assembly Bill 2717 called for DWR to establish a Desalination Task Force to evaluate the following: 1) Potential opportunities for desalination of seawater and brackish water in California, 2) Impediments to using desalination technology, and 3) the role of the State in furthering the use of desalination.<sup>56</sup> In October 2003, the task force, comprised of 27 organizations, provided a list or recommendations related to the following issues: general, energy, environment, planning, and permitting.

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<sup>56</sup> DWR, California Water Plan Update 2005, Volume 2 – Resource Management Strategies

### **Metropolitan's Seawater Desalination Program**

In August 2001, Metropolitan launched its Seawater Desalination Program. The program objectives were to provide financial and technical support for the development of cost-effective seawater desalination projects that will contribute to greater water supply reliability. In 2004, Metropolitan adopted an IRP Plan Update that includes a target of 150,000 AFY for seawater desalination projects to meet future demands. A call for proposals, under the Seawater Desalination Program, produced five projects by member agencies including the Los Angeles Department of Water and Power, Long Beach Water Department, MWDOC, San Diego County Water Authority, and West Basin Municipal Water District. Collectively, the projects could produce approximately 126,000 AFY. This additional source of water supply would provide greater water reliability for Southern California residents.

Metropolitan has also provided funding to five member agencies to research specific aspects of seawater desalination. The agencies are reviewing and assessing treatment technologies, pretreatment alternatives, and brine disposal, permitting, and regulatory approvals associated with delivery of desalinated seawater to the local distribution system.<sup>57</sup> Metropolitan continues to work with its member agencies to develop local projects, inform decision makers about the role of desalinated sea water on future supplies, and secure funding from various state and federal programs.

### **Department of Water Resources Proposition 50 Funding**

In January 2005, DWR received 42 eligible applications requesting \$71.3 million from funds available through Proposition 50. Proposition 50, the Water Quality, Supply and Safe Drinking Water Projects, Coastal Wetlands Purchase and Protection Act was passed by voters in 2002. Projects eligible for the program include construction projects, research and development, feasibility studies, pilot projects, and demonstration programs. Local agencies, water districts, academic and research institution will be able to use the funds in the development of new water supplies through brackish water and seawater desalination.

DWR is recommending funding for 25 of the 43 projects with the available \$25 million under the current desalination grant cycle. With this funding recommendation, 54 percent of the fund will support brackish water desalination related projects and 46 percent will support ocean desalination related projects. The projects recommended for funding include facilities in Marin, Alameda and San Bernardino counties. Pilot projects in Long Beach, Santa Cruz, San Diego and Los Angeles are among those that will receive grants under the proposed funding plan. Research and development activities at the Lawrence Livermore National Laboratory and the University of California, Los Angeles are included in the recommendations, as are feasibility studies by agencies in the Bay Area, Monterey, and Riverside County.

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<sup>57</sup> Metropolitan's UWMP, 2005



### **MWDOC and OCWD's Seawater Desalination Concept Analysis**

MWDOC and OCWD conducted a study, *Seawater Desalination Concept Analysis*, in March 1999 to determine the relative cost-effectiveness of ocean desalting compared to other potential supplies. They continued to develop a program concept and in 2003 published their draft *Ocean Water Desalination Program Concept Development Paper* (Concept Paper). The Concept Paper was prepared to provide OCWD and MWDOC with additional information on potentially developing an ocean water desalter at the AES Huntington Beach Generating Station site, owned by AES Corporation.

The purpose was to outline the AES site opportunities and identify the key issues to be resolved before moving forward with planning and implementation efforts. The project continues to be conceptual in nature; however, the concept paper investigates the opportunities surrounding the planning and feasibility of ocean desalination in Orange County using a specified site with existing infrastructure. The project concept is the development of a 50 MGD ocean water desalination plant to provide base water supply for the OCWD service area. A 50 MGD plant could be expected to produce 50,000 AFY.

The implementation of an ocean water desalination plant can reduce groundwater pumping levels in coastal OCWD and assist in refilling the groundwater basin. It could serve as an emergency backup supply for the South Orange County as well as reduce the amount of water required for seawater barrier injection. Implementation of the ocean water desalination plant would require regulatory compliance, environmental stewardship stakeholder interface, and a lengthy completion schedule.

### **Proposed Projects for Desalination**

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC, including one specifically that may benefit the City. The proposed projects are discussed in MWDOC's 2005 Regional UWMP and summarized below.

**Poseidon Resources Corporation Proposed Project** – Poseidon Resources Corporation, a private company, is proposing a seawater desalination project to be located adjacent to the AES Generation Power Plant in Huntington Beach. The proposed project would provide 50 MGD of water supply to coastal and south Orange County. In 2003, the City of Huntington Beach denied certification of the Environmental Impact Report (EIR). A Recirculated EIR was subsequently prepared. The project is currently in the environmental review and permitting phase and there are no contractual agreements in place for the purchase of water.

**Joint San Diego/Orange County Proposed Regional San Onofre Project** – This joint project is currently being investigated to determine project feasibility. The project size is anticipated to range from 50 – 150 MGD and utilize the decommissioned Unit 1 San Onofre Nuclear Generation Station cooling water inlet and outlet conduits for feedwater and brine disposal. The project may be implemented in 2020.

**MWDOC Proposed Dana Point Ocean Desalination Project** – MWDOC is currently investigating the feasibility of a desalination project in Dana Point adjacent to San Juan Creek. The feasibility study will evaluate feedwater supply, concentrated RO reject disposal, and energy. The recommended capacity is 25 mgd. MWDOC received DWR Proposition 50 funding in the amount of \$1,000,000 to investigate horizontal directional drilling with water well technology for use in constructing feedwater supply wells in the marine alluvial channel system.<sup>58</sup>

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<sup>58</sup> MWDOC 2005 Regional Urban Water Management Plan.

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**SECTION 5  
 WATER USE PROVISIONS**

**5.1 PAST, CURRENT AND PROJECTED WATER USE AMONG SECTORS**

**WHOLESALE**

Since 2000, no new connections were added to the wholesale water distribution system. Table 5.1-1 shows past, current and projected water use between 2000 and 2030. The five water users include the EOCWD Retail System, City of Orange, City of Tustin, Orange Park Acres Mutual, and the Southern California Water Company. These agencies are long standing wholesale customers to EOCWD and no new connections/customers are anticipated for the future.

**Table 5.1-1  
 EOCWD Wholesale Zone  
 Past, Current and Projected Connections Per Sector**

	2000	2005	2010	2015	2020	2025	2030
Institutional / Governmental	17	17	17	17	17	17	17
<b>Total Connections</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>

Collectively, the overall water demand is anticipated to increase from 2010 through to 2030 (as shown previously in Table 4.2.1.5). Water demands are much higher in 2005 due to the in-lieu program participation. Future projections assume no in-lieu participation. Past, current and projected water connections and water usage information by sector for the Wholesale service area is summarized in Table 5.1-2.

**Table 5.1-2  
 EOCWD Wholesale Zone  
 Past, Current and Projected Water Use Per Sector**

	2000	2005	2010	2015	2020	2025	2030
Institutional / Governmental	5,184	10,246	4,850	4,960	5,020	5,050	5,060
Unaccounted for System Losses <sup>1</sup>	324	257	120	125	125	125	125
<b>Total Water Use</b>	<b>5,508</b>	<b>10,503</b>	<b>4,970</b>	<b>5,085</b>	<b>5,145</b>	<b>5,175</b>	<b>5,185</b>

<sup>1</sup>Future projected losses are based on 2.5% loss experienced in 2005.

**RETAIL**

As previously noted, about half a dozen new connections per year have been added to the Retail System since 2000. This trend is expected to continue for the next 25 years and will result in an overall increase in the service area population of about 12 percent. Although the population is projected to increase by 12 percent, new plumbing efficiency standards, landscape guidelines, and other water use efficiency programs, water demand will result in an estimated overall increase in water demand of about 6 percent. Past, current and projected water connections by sector for the Retail Service area is shown in Tables 5.1-3.

**Table 5.1-3  
EOCWD Retail Zone  
Past, Current and Projected Connections Per Sector**

	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Single Family Residential	1,150	1,174	1,180	1,186	1,192	1,198	1,204
Commercial	1	1	1	1	1	1	1
Institutional /Municipal	2	2	2	2	2	2	2
Landscape/Irrigation	14	14	14	14	14	14	14
Agriculture	1	1	1	1	1	1	1
<b>Total Connections</b>	<b>1,168</b>	<b>1,192</b>	<b>1,198</b>	<b>1,204</b>	<b>1,210</b>	<b>1,216</b>	<b>1,222</b>

Table 5.1-4 shows past, current and projected water use between 2000 and 2030. The lone commercial customer is the Orange County Mining Company Restaurant, the institutional/governmental customers include El Modena Park and the Panorama Elementary School, and the agricultural customer is Sierra farms. Additionally, the Retail Zone provides water service to 14 common area landscape meters.

**Table 5.1-4  
 EOCWD Retail Zone  
 Past, Current and Projected Water Use Per Sector**

	2000	2005	2010	2015	2020	2025	2030
Single Family Residential	1,149	975	1,117	1,127	1,147	1,157	1,177
Commercial	5	9	10	10	10	10	10
Institutional /Municipal	17	21	22	22	22	22	22
Landscape/Irrigation	21	20	20	20	20	20	20
Agriculture	0	1	1	1	1	1	1
<b>Subtotal</b>	<b>1,192</b>	<b>1,026</b>	<b>1,170</b>	<b>1,180</b>	<b>1,200</b>	<b>1,210</b>	<b>1,230</b>
Unaccounted for System Losses <sup>1</sup>	30	25	30	30	30	30	30
<b>Total Water Use</b>	<b>1,222</b>	<b>1,051</b>	<b>1,200</b>	<b>1,210</b>	<b>1,230</b>	<b>1,240</b>	<b>1,260</b>

<sup>1</sup> Future losses are estimated to approximately equal the 2.4% to 2.5% loss experienced in 2000 and 2005.

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## **SECTION 6 WATER DEMAND MANAGEMENT MEASURES**

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### **6.1 INTRODUCTION**

EOCWD recognizes water use efficiency as an integral component of current and future water strategy for the District. Through the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), 14 Best Management Practices (BMP's) have been established, which are equivalent to demand management measures (DMM). Collectively, DMMs refer to policies, programs, rules, regulation and ordinances, and the use of devices, equipment and facilities that, over the long term, have been generally justified and accepted by the industry as providing a "reliable" reduction in water demand. The DMMs are typically technically and economically reasonable, environmentally or socially acceptable, and are not otherwise unreasonable for most water suppliers to carry out.

MWDOC is signatory to the MOU and provides the following on behalf of its member agencies, including EOCWD and its sub-agencies:

1. On-going water use efficiency program support for member agencies.
2. Lead agency to implement water use efficiency programs that are more cost-effectively implemented on a regional basis rather than a local basis.
3. Secures outside funding for water use efficiency projects and programs from Metropolitan's Conservation Credits Program, United States Bureau of Reclamation, State Water Resources Control Board, and other sources.

MWDOC's 2005 Regional Urban Water Management Plan should be referred to for a detailed discussion of each regional BMP program.

### **6.2 DETERMINATION OF DMM IMPLEMENTATION**

EOCWD was not required to prepare a 2000 UWMP and therefore did not indicate what level of BMP activity would occur between the years 2000 and 2005. Therefore, the following section generally describes the level of BMP implementation by EOCWD and/or by MWDOC on behalf of EOCWD.

### **6.3 DEMAND MANAGEMENT MEASURES (DMMs)**

EOCWD has continued to work with Metropolitan, MWDOC, and OCWD towards implementing the 14 cost-effective DMMs, which are incorporated in regional water



agencies rate surcharges. These 14 DMMs include technologies and methodologies that have been sufficiently documented in multiple demonstration projects that result in more efficient water use and conservation. Since EOCWD operates as both a wholesale and retail entity, the following statements apply to both entities. As the regional wholesale agency, MWDOC implements many of the DMM's on behalf of EOCWD.

### **BMP 1 – Residential Water Surveys for Single and Multi-Family Residential Customers**

Residential surveys have been conducted in the District on an informal basis by customer request through a high water bill complaint or meter reading that indicated higher than normal usage. When such a request is made, District staff review past billing records for the account in question and compare them with the current bill. They then visit the customer's residence and review the information with them. If it appears that a significant recent increase has occurred, District staff first looks for signs of a possible leak. They also question the customer about possible internal plumbing problems (leaking faucets, running toilets, etc) and make recommendations to reduce landscape irrigation where appropriate. Since this program is informal and responsive, no data on quantities of surveys is currently available. The District has implemented this program on an ongoing basis for several years, and as a result, there is not a definite initiation date for when this program began. The program will continue to be incorporated into the District's regular operations.

Based on the California Urban Water Conservation Council's savings rates, set forth in the BMP Costs & Savings Study (December 2003), savings from untargeted intensive home surveys results in an average of 21gpd per household (both single family and multi-family) total savings for future projections.

The District will measure the effectiveness of water survey programs through analyzing the number of surveys distributed and the difference in water consumption for the families after the surveys are conducted. The program will continue on an ongoing basis through 2010 and beyond.

### **BMP 2 – Residential Plumbing Retrofits**

MWDOC has tracked distribution and installation of low-flow showerheads and ULFT toilet replacements on behalf of its member agencies since 1991. From 1991 to date, 5,473 ULFTs have been retrofitted in single family homes throughout MWDOC's service area, 3,978 in multi-family homes, and 8,059 low-flow showerheads have been installed. The District distributed low-flow showerheads in 1995 and encourages residents within its service area to participate in the program through MWDOC.

Using the 2001 *Orange County Saturation Study* as a benchmark, saturation of low-flow showerheads was measured at 67% and 60% in single- and multi-family housing stock respectively. Today, low-flow showerhead saturation is estimated at nearly 100% and

94% saturation in single- and multi-family homes. As a result, water agencies throughout Orange County have achieved the 75% saturation requirement for this BMP.

Residential Plumbing retrofits result in approximately 0.146 AFY, based on MWDOC's water savings calculations. The method to evaluate effectiveness will consist of calculating estimated water savings for each BMP and comparing historic water demand with the current water demand and determining the quantity of water savings. EOCWD will continue to offer the program to its service area through MWDOC through 2010.

### **BMP 3 – Distribution System Water Audits, Leaks Detection and Repair**

EOCWD aggressively repairs main breaks, hydrant leaks or breaks, and meter leaks. A team of water service workers are available to permanently repair main or hydrant breaks, and promptly restore water service. Both proactive and “inform and response” approaches are utilized for water meter leaks. All meter leaks are investigated and repaired the same day, unless unable to do so, then next day service is performed. This method of response audits has been conducted for many years and will continue as part of normal operations and emergency response.

MWDOC annually publishes the Orange County Water Agencies Water Rates, Water System operations, and Financial Information survey. This survey facilitates a pre-screening survey that estimates the volume and percent of unaccounted for water for each retail water agency in Orange County. In 2004, the percent of unaccounted for water for retail water agencies ranged from a low of 1.2% to a high of 10.7%, with an average of 5.1%.<sup>59</sup>

EOCWD's unaccounted for water percentage is monitored on a monthly basis. Distribution system leak detection and repairs have been made to lower the unaccounted water usage to below the cost-effective standard set by the American Water Works Association (AWWA) of 9%.

The level of unaccounted-for water will continue to be regularly monitored. If water losses were to rise appreciably and if cost-effective, a system wide survey of distribution facilities would be implemented. To evaluate the effectiveness of these conservation measures, staff will review the data records to confirm that the unaccounted-for-water losses remain low and consistent. The CUWCC has established a standard rate of water savings based on the repair of a distribution line: a 1-inch crack in a distribution main at 100 psi can leak 57 gallons per minute. Cost and savings depend on the age of infrastructure for the water system.

### **BMP 4 – Metering with Commodity Rates**

EOCWD requires meters for all new water connections and bills by volume of use. All water service connections, with the exception of dedicated fire services, are metered. EOCWD has retrofitted all existing unmetered connections to be metered.

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<sup>59</sup> MWDOC Draft Urban Water Management Plan. October 5, 2005.

Section 5 shows the number of water service customers by sector between 2000 and 2005, and projections of customers through 2030. All service connections are metered. Past, current, and projected water connections by sector for the Wholesale Service area is shown in Table 5.1-1 and for the Retail Service area is shown in Tables 5.1-3. The number of wholesale service connections is expected to remain the same through 2030. The number of retail service connections is anticipated to increase very slightly through 2030, consistent with the projected small increase in population.

Metering allows the District to conserve a total of 20-30 percent of the water demand overall, and up to 40 percent savings during peak demand periods, as estimated by the CUWCC's BMP Costs and Savings Study (December 2003). The measure of effectiveness will include a comparison of water use before and after meter calibration.

### **BMP 5 – Large Landscape Conservation Programs**

EOCWD's number of landscape and CII accounts for the Wholesale Service area is shown in Table 5.1-1 and for the Retail Service area is shown in Tables 5.1-3. To focus on conserving water use for these sectors, EOCWD participates in MWDOC's regional irrigation efficiency programs. MWDOC and Metropolitan provide sponsorship and performance-based funding for these programs to offset the cost to the customer. These programs include the Landscape Contractor Certification Program and the Protector Del Agua Irrigation Management Training.<sup>60</sup>

*Protector del Agua Irrigation Training Program.* This program is free to EOCWD participants and offers information for the landscape professional on water management, enhanced landscape practices, and practical ideas to improve their bottom line. The Program allows landscapers to stay abreast of the policy and activities of the water agencies, and proper cultural practices within their industry. From the program's inception in FY 2001-02 to FY 2004-05, a total of 962 English participants and 894 Spanish participants throughout MWDOC's service area have taken part in the program. As part of the program, a Landscape Certification is offered.

*Landscape Contractor Certification Program:* This program is designed to develop landscape irrigation budgets for dedicated landscape meters in cooperation with landscape contractors, property management companies, cities, school districts, and county facilities.

These programs directly benefit EOCWD through landscape contractor activities. Such activities include landscape irrigation budgets, green material management, computer controlled irrigation systems, and bilingual irrigation management training, including advanced irrigation schedule programming and plant identification to promote use of arid climate plantings.

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<sup>60</sup> Municipal Water District of Orange County, Regional Urban Water Management Plan, December 2000.

SmartTimer Rebate Program

On a smaller scale, EOCWD residents are also eligible to participate in MWDOC's Smart Timer landscape irrigation controller program (Rebate Program). The SmartTimer Rebate Program began in September 2004 and offers an incentive to retrofit the existing irrigation controller with a weather based irrigation controller. Both single family residential and commercial customers who have an existing clock are eligible to participate. SmartTimers sense weather conditions and apply the right amount of water for plants to prevent overwatering and urban runoff. In collaboration with Metropolitan and the State Water Boards, MWDOC offers rebates of \$20 per set up and operating valve for residential use. Single family residential homes must have a minimum of 1,200 square feet of irrigated landscape. Rebates for commercial customers are \$12 per attached operating valve and an additional \$500 per acre under the control of the installed technology. This program also allows MWDOC member agency residents to accomplish the following:

1. Save money by reducing outdoor water use by up to 41 gallons per day per residential installation
2. Advance the health and appearance of landscape
3. Reduce runoff and pollution by 49%

Since the program's inception in FY 2004-05, a total of four smart timer devices have been installed within the residential community. Participation in this program is anticipated to grow, with a total of 5,000 residential and commercial SmartTimer installation targeted through 2010. The measure of effectiveness for the District in implementing this BMP will consist of the amount of increase in class participation and number of SmartTimer installed within the service area.

**BMP 6 – High-Efficiency Washing Machine Rebate Programs**

Through MWDOC, a \$100 rebate is offered for the purchase of a high efficiency clothes washer for machines installed in Orange County. As of May 1, 2005, machines must have a water factor of 6.0 or less to qualify for the rebate program. Such machines typically use 15 to 25 gallons less water per load, with a potential water savings of up to 7,000 gallons per year. These washing machines are offered for single family residential homes. Since EOCWD's program participation began in FY 2001-02, EOCWD has installed a total of 31 high efficiency clothes washers, with 0.98 AFY total water savings.

Table 6.3-1 below shows estimated water savings based on this rate for historical and projected rebates.

**Table 6.3-1  
BMP 6 – High-Efficiency Washing Machine Rebates**

EOCWD	2001-2004	Current and Projected (2005-2010)
\$ per rebate	\$100	\$100
# of HECW rebates	31	50
Water Savings (AF)	4	6

In addition, Southern California Edison (SCE) initiated a High Efficiency Clothes Washer (HECW) Rebate Program in 1999. The HECW Program consists of two different tiers of rebates (\$50 and \$100) based on the level of energy savings by specified high-efficiency clothes washers. Metropolitan participated in the program, including Orange County, which has contributed \$35 for the water savings.

The method to measure effectiveness of this BMP will include quantifying the number of HECM's distributed and the total potential water savings, and then analyzing the water demand after one year of implementation to observe how the water demand changed. The District will continue to offer this program to its service area through 2010.

### **BMP 7 – Public Information Programs**

MWDOC provides a comprehensive public information program built around communication, coordination and partnerships. MWDOC holds monthly Public Affairs Workgroup meetings with its member agencies to coordinate public outreach efforts and share information and ideas on a countywide basis.

EOCWD supports MWDOC on a public information education and outreach program that provides information regarding present and future water supplies, the demands for a reliable supply of high quality water, and the importance of implementing water efficient techniques and behaviors.

EOCWD informs their water customers of upcoming public information events and encourages participation in water conservation efforts and programs sponsored by MWDOC and Metropolitan. Through a variety of public information programs, MWDOC has assisted EOCWD in promoting water conservation awareness in the annual statewide Water Awareness Month held in May and the National Drinking Water Week; which includes a Children Drinking Water Festival geared to promote water education, a poster and slogan contest, and distribution of water education kits to classrooms. MWDOC's public information programs are promoted through a public affairs workgroup that hosts a poster/slogan contest each year. An array of local and regional events are held through the Association of California Water Agencies and the California Water Awareness Campaign. MWDOC's Speakers Bureau conducts presentations on the

various programs offered by MWDOC. Facility inspections tours are also held each year to observe the Colorado River Aqueduct, the State Water Project, and the Diamond Valley Lake through Metropolitan. Information materials on water use and conservation are regularly distributed to residents within the service area and water quality reports are issued per DHS requirements. Media relations staff members at MWDOC manage communication of regional and statewide water issues for Orange County.

Overall, MWDOC provides paid advertising, bill inserts/newsletters/brochures, demonstration gardens, special/media events, speaker's bureau, and coordination with other government agencies, industry, and public interest groups and media.

EOCWD regularly distributes a variety of information materials to the public, including newsletters, fact sheets, brochures, issue bulletins, manager's reports, and annual reports.

The method to measure effectiveness of implementing this BMP for the District will include quantifying the number of participants in the public programs, as well the number of public announcements/brochures distributed throughout the service area. An increase in participation and distribution of materials will indicate heightened public water conservation awareness and may correlate with decrease water demand.

### **BMP 8 – School Education Programs**

Through MWDOC, water education programs have been available to the EOCWD's public and private schools for over 30 years. Specific programs with State-approved curriculum are offered for students from kindergarten through high school. Programs include classroom presentations by MWDOC staff teachers, audio-visual programs, hands-on activities, take-home materials for students, and workbooks and supplies for teachers.

During the 1999/00 school year, nearly 120,000 students were educated in Orange County through MWDOC's program and over 500,000 students since 1995.<sup>61</sup> The number of students educated annually has doubled since 1979/80.

In the case of EOCWD, MWDOC staff has visited the Panorama Elementary School within the Retail Service area. In FY 00/01, a total of 2,373 students participated in the school education programs, including a total of 28 classroom presentations. Also, in FY 01/02, a total of 1,277 students participated in the school education program and a total of 15 presentations were completed. In recent years they have also visited a number of schools within the Wholesale system, although no specific numbers were immediately available.

The District will measure the effectiveness of this BMP through analyzing the total number of students and schools participating in the presentations and assess whether the program calls for expansion. Increased education on water conservation activities correlates with decreased consumption over time through habitual/routine water use.

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<sup>61</sup> Municipal Water District of Orange County, Regional Urban Water Management Plant, December 2000.

**BMP 9 – Commercial, Industrial and Institutional Programs**

In FY 1995/96, MWDOC designed and implemented a Commercial, Industrial and Institutional (CII) Water Use Survey Program on behalf of its member agencies with funding from Metropolitan and the U.S. Bureau of Reclamation (USBR). A trained auditor visited each location to survey all water using devices at each site. Participants received a report detailing potential water saving areas, both through behavioral modifications and the retrofitting of specific low-flow devices.

During fiscal years 1997/98 and 1998/99, MWDOC developed an in-house CII rebate program utilizing funding provided by Metropolitan and OCSD. MWDOC's CII rebate program signified the first time MWDOC was able to acquire funds from OCSD to assist in the installation of retrofit devices aimed at reductions in waste water flows. Participants from the CII Program were solicited to participate with rebate funds targeting specific devices identified through the survey process.

During fiscal year 1999/00, MWDOC phased out its own rebate program and began arrangements to participate in Metropolitan's regional rebate program. In 2002, MWDOC began supporting and participating in the Save Water – Save a Buck! Program. This program offers rebates to assist commercial, industrial, and institutional customers in replacing high-flow plumbing fixtures with low-flow fixtures. Facilities where low-flow devices are installed must be located on Orange County. Rebates are available only on devices, as listed in Table 6.3-2.

**Table 6.3-2  
BMP 9 – MWDOC Save a Buck! Retrofit Devices and Rebate Program**

Retrofit Device	Rebate Amount
Ultra-Low-Flush Toilet	\$60 to \$120
Ultra-Low-Flush Urinal or Waterless Urinal	\$60
Flush Valve Retrofit Kit	\$15
Coin/Card-Operated high Efficiency Commercial Clothes Washer	\$250
Cooling Tower Conductivity Controller	\$500
Hospital X-ray Film Processor Re-circulating System	\$2,000
Water Pressurized Broom	\$100

MWDOC will work with its member agencies to target smaller commercial and institutional sites to retrofit high water using devices. In order to provide the highest possible funding incentive, MWDOC is looking to OCSD, OCWD, and highly motivated member agencies to augment the funding provided by Metropolitan.

EOCWD supports OCWD's Hotel and Motel Water Conservation Program. This program offers free laminated hangers to promote the reuse of towels and bed linens for multiple day usage. In addition, hotels and motels that sign up for the program also receive a bilingual instructional video for use in training their housekeeping staff. This program allows the guests and the hotel or motel to be environmentally aware while reducing water use, lowering costs, savings energy, and reducing pollution.

Through OCWD, EOCWD promotes a Restaurant Water Conservation Program that offers free laminated tent cards for restaurant to place on their tables. The cards explain to guests the restaurants' interest in helping conserve water for Orange County and that the restaurant will only be serving water upon request.

EOCWD will continue to promote and support the regional CII Program through ongoing program endorsement and distribution of informational brochures. MWDOC will provide program effectiveness and conservation savings information, and will fund the program through their budget. The CII Rebate Program provides a total of 17.8-20.3 percent median and 17.9-29.2 percent mean in savings on an annual basis. To measure the effectiveness of this BMP, the District will perform a water savings analysis by calculating the total number of rebates distributed and the estimated water savings for each. The total of this calculation will show the amount of water saved and should be reflected in the overall water use before and after implementation of the BMP.

### **BMP 10 – Wholesale Agency Assistance Programs**

As a member agency of MWDOC, EOCWD receives assistance to implement water use efficiency programs. MWDOC has provided the following assistance: 2) implementation of regional programs on behalf of EOCWD and all Orange County water agencies; 2) acquisition of annual grant funding from a variety of sources; and 3) technical assistance regarding local program design and implementation, benefit/cost analysis, conservation based rate structures, and program marketing.

EOCWD will continue to work cooperatively with MWDOC to participate in regional BMP programs, informational groups and projects, determination of the most cost-effective BMPs, and tailoring programs specific to EOCWD.

### **BMP 11 – Conservation Pricing**

Conservation pricing can be defined as “rates designed to recover the cost of providing service.” EOCWD's rates include a fixed commodity charge (currently \$1.63/ccf-7.48/cf), a fixed metered account charge (currently \$8/month) and a capital recovery charge (currently \$10/month). The rates have been designed to recover the full cost of water service in the commodity charge and will continue to be implemented into the future.



**BMP 12 – Conservation Coordinator**

EOCWD assigns staff to work closely with the Water Use Efficiency staff at MWDOC to provide successful execution of regional programs, and those conducted on behalf of EOCWD. EOCWD may either directly participate in or be represented by MWDOC in regional workgroups including the Water Use Efficiency Workgroup, Public Affairs Workgroup, County of Orange Supervisor’s Water Task Force, and the Orange County Water Use Efficiency Steering Committee.

**BMP 13 – Water Waste Prohibition**

The EOCWD Board of Directors adopted Ordinance No. 1991-1 (March 1991) which allows the Board to impose charges, surcharges, and penalties as deemed necessary to accommodate water allocations, charges and penalties imposed by Metropolitan through MWDOC, and other factors affecting the supply and cost of water to the EOCWD. This Ordinance includes provisions stating that at no time shall water be wasted or used unreasonably. The ordinance is phased into three water conservation stages. The ordinance specifically prohibits leaks, runoff, and washing vehicle and equipment. This ordinance is also incorporated into the District’s Water Shortage Contingency Plan. The Ordinance will continue to be enforced.

**BMP 14 – Residential Ultra-Low-Flush Toilet (ULFT) Program**

The ULFT Program is sponsored by the Water Use Efficiency Steering Committee, which includes OCWD, MWDOC, OCSD and other cities and water districts in Orange County. The program has been implemented over the last 13 years. The Steering Committee participates in underwriting the no-cost, ultra-low-flush toilet program that encourages county residents to replace inefficient toilets. The program could eventually replace 900,000 residential toilets in Orange County, creating an annual savings of approximately 25,000 AF of water per year.

EOCWD customers have participated in various regional programs that are jointly funded from the foregoing entities through ULFT Give-Aways and ULFT Rebate Programs. Since FY 95/96, EOCWD has successfully installed 300 ULFTs throughout its service area. Implementation of ULFT’s are presented in Table 6.3-3 below. Approximately 23.4 gallons of water per day are saved with the installation of the ULFTs for single family and 48.7 gallons per day per device for multi-family.

**Table 6.3-3  
BMP 14 – ULFTs Rebate Program**

<b>Previous Years</b>	<b>FY 99/00</b>	<b>FY 00/01</b>	<b>FY 01/02</b>	<b>FY 02/03</b>	<b>FY 03/04</b>	<b>FY 04/05</b>	<b>FY 05/06</b>	<b>Total</b>	<b>Water Savings</b>
113	17	15	50	41	44	19	1	300	44 AFY

The method to measure effectiveness will include a calculation of the total number of ULFT’s and rebates distributed throughout the service area, the resulting water savings,

and the changes in water demand following implementation of the ULFT's. The District will continue to offer this program to its service area on an ongoing basis as available.

## **ADDITIONAL WATER CONSERVATION PROGRAMS**

In addition to the efforts identified under the BMPs above, EOCWD has implemented additional water conservation related activities, including outreach programs. EOCWD is continuing to work toward the development and implementation of outreach programs designed to identify high water consumption. EOCWD is dedicated to being responsive to broken sprinklers and water misuse when notified by its customers. Upon identification of high water consumption or misuse, EOCWD will efficiently investigate the report and inform the customer of any problems found, as well as possible water conservation measures.

MWDOC's Industrial Process Water Use Reduction Program was approved for full funding (\$404,801) under the DWR Water Use Efficiency Grant Program. It is anticipated that the project, once implemented, will result in a total water savings of 689 AFY, contributing toward CALFED Benefits. The program will result in both local and statewide benefits. The programs' main purpose is to promote water conservation, such as reducing wastewater flows to treatment plants and decreasing pollution along coastal waters.

In addition, Metropolitan proposed five water conservation programs for funding under the DWR Water Use Efficiency Grant Program. The programs include the following:

- Residential High Efficiency Clothes Washer Rebate Program – The Residential High Efficiency Clothes Washer Rebate Program offers rebates toward the purchase of water- and energy-saving clothes washing machines, which will reduce the demand on water imported from the Bay Delta by 12,275 AFY. This 2-year program was funded at \$1.66 million.
- California Friendly Communities – The program will result in CALFED Benefits, which include avoiding Bay Delta diversions. California Friendly Communities is a grant program in which cities receive funding to transform their landscape to increase water conservation. A maintenance plan, enhanced irrigation and controllers, and landscaping techniques are exercised through this program. This program received \$424,150 in funding for 1,650 valves for multi-family residences.
- High-Efficiency Toilet Rebate Program – A rebate is given to customers who purchase a new High Efficiency Toilet. The toilet uses a minimum of 20% less water than standard toilets and will supply 41 AFY of water savings. This program was funded at \$1.0 million for a total of 10,000 ULFTs.
- Online/Web-Based Irrigation Efficiency Training – This program will provide two class courses for residential and professional participants, as well as educate individuals about water use, efficiency training, and educational programs. DWR funded one residential series class and two classes from the professional course for a total of \$77,500.

#### **6.4 WATER USE EFFICIENCY PROGRAM SCHEDULING AND EFFECTIVENESS**

The Orange County Water Plan, *Focus on Orange County's Water Future*, as discussed in MWDOC's Regional UWMP, adapts and applies the Metropolitan-Main Model. The Model forecasts water demands on both a regional basis and at the retail level to produce an estimate of future water demand, the identification of potential benefits, and costs associated with implementation of the BMPs (or DMMs). The conservation potential by retail water agency is used to develop BMP implementation plans using a "least cost approach" to develop a "most cost effective" package of BMP programs customized for each retail agency. A Conservation Savings Model estimates the potential water conservation from implementation of the BMPs. Once the potential water savings are quantified, programs can be developed to target potential savings.

Water use efficiency is an integral part of water supply planning and operations. EOCWD works to improve the understanding of costs and benefits of conservation so that investment decisions are efficient and effective at meeting program goals. As a cooperative member of California's conservation community, EOCWD supports MWDOC's significant contributions to the development and coordination of water use efficiency activities for its member agencies and throughout Orange County.

Many of the DMMs have been implemented based upon the MOU schedule for MWDOC, others are being implemented, and all DMMs will continue on an ongoing basis. EOCWD will continue to work cooperatively with MWDOC to implement cost-effective DMMs on an ongoing basis for each program through 2010 and beyond.

## **SECTION 7 WATER SHORTAGE CONTINGENCY PLAN**

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### **7.1 INTRODUCTION**

California's extensive system of water supply infrastructure, its reservoirs, groundwater basins, and inter-regional conveyance facilities, mitigates the effect of short-term dry periods. Defining when a drought begins is a function of drought impacts to water users. Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Droughts occur slowly, over a multiyear period. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

EOCWD Resolution No. 422, adopted on August 25, 1998, established the drought management program for the service area. The Resolution authorizes the General Manager to implement voluntary drought management program, with the goal of reducing water use by 10 percent, to reduce the risk of severity of water shortages. Under this resolution, EOCWD urges all consumers to abide by ten actions (a- j). In addition, EOCWD will encourage restaurants within its jurisdiction not to serve drinking water to any customer except upon request. Finally, the Resolution states that EOCWD finds that a phased program beginning with voluntary measures to reduce consumption will best achieve the goal of conserving the water supply without causing unnecessary adverse economic consequences. For the complete detail of the Drought Management Ordinance, refer to Resolution No. 422 included in Appendix F.

### **7.2 STAGES OF ACTION**

#### **Rationing Stages and Reduction Goals**

EOCWD's Ordinance No 1991-1 (also included in Appendix F) outlines the general provisions for conservation of the public water supply. The Ordinance includes 3 Phases of water conservation. Prohibitions under each Phase are described in Section 7.5. Phase I enforces basic conservation measures. Phase II prohibits violation of Phase I and making, causing, using, or permitting the use of water for any purpose in an amount in excess of eighty-five percent (85%) of the amount used on that customer's premises during the corresponding billing period of the base period as determined by the Board of Directors. Phase III states that no person shall violate provisions of Phase I and II, specifically prohibiting anyone that makes, causes, uses or permits the use of water for any purpose in excess of eighty percent (80%) of the amount used on the customer premises during the corresponding billing period of the base period as determined by the Board of Directors.

Implementation of water conservation phases will take place once the General Manager enforces and administers the provisions of the Ordinance. During periods of water shortages, the District will monitor and evaluate the demand for water by customers and the project

available supply. Upon determination, the General Manager shall recommend to the Board of Directors any change in the conservation phase which may be necessary in order for the District to prudently supply water to its customers. The Board shall make findings of a shortage and declare the conservation phase by resolution. The provisions of Phase II and Phase III requiring a percentage curtailment in the use of water shall be effective the first full billing period commencing on or after the date of resolution. The Phase II and Phase III percentage curtailment in water use will establish the percentage of water consumption curtailment for the EOCWD service area and may set the percentage at 50% reduction, if appropriate.

To meet short-term water demand deficiencies and short- or long-term drought requirements, EOCWD will also implement its water shortage plan for the wholesale and retail systems in accordance with MWDOC's response to Metropolitan's Water Surplus and Drought Management (WSDM) Plan.

The WSDM Plan guiding principle is to minimize adverse impacts of water shortage and ensure regional reliability. From this guiding principle come the following supporting principles:

- Encourage efficient water use and economical local resource programs.
- Coordinate operations with member agencies to make as much surplus water as possible available for use in dry years.
- Pursue innovative transfers and banking programs to secure more imported water for use in dry years.
- Increase public awareness about water supply issues.

The WSDM Plan defines the expected sequence of resource management actions that Metropolitan will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable; however, in the event of an extreme shortage; an allocation plan will be adopted in accordance with the principles of the WSDM Plan. MWDOC will respond to Metropolitan's implementation of the WSDM Plan, and in turn, EOCWD will respond accordingly.

### **Health and Safety Requirements**

The primary goal of EOCWD is to preserve the health and safety of its personnel and the public. Meeting this goal is a continuous function of the system – before, during and after a disaster or water shortage. Fire suppression capabilities will continue to be maintained during any water shortage contingency stage. Some water needs are more immediate than others. Ordinance No. 1991-1 states that EOCWD is not required to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

**Priority by Use**

Water allocations are established for all customers according to the following ranking system:

- I. Minimum health and safety requirements for the interior residential needs
- II. Commercial, industrial, institutional/governmental operations, excluding landscape irrigation
- III. Permanent agriculture, requiring at least five years to return to production
- IV. Annual agriculture
- V. New customers (proposed projects without permit when shortage is declared)

**7.3 ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS**

Metropolitan projects 100 percent reliability for full-service demands through the year 2030.<sup>62</sup> Additionally, through a variety of groundwater reliability programs conducted by OCWD and participated in by the District, local supplies are projected to be maintained at demand levels. The District anticipates the ability to meet water demands for both Wholesale and Retail systems through the next three years based on the driest historic three-years as shown in Tables 7.3-1 and 7.3-2.

**Table 7.3-1  
 Wholesale Water System Supply  
 Three Year Estimated Minimum Water Supply  
 (Based on Driest 3-Year Historic Sequence)  
 (AF)**

Source**	Normal Base Year	Multiple Dry Year		
	2006	2006	2007	2008
Local Supplies	0	0	0	0
Imported Supply	6,390	6,270	6,270	6,270
<b>Total</b>	<b>6,390</b>	<b>6,270</b>	<b>6,270</b>	<b>6,270</b>

Source: Table 4.2.1-6

<sup>62</sup> Metropolitan Water District of Southern California, 2005 Regional UWMP, September 2005 Draft

**Table 7.3-2  
Retail Water System Supply  
Three Year Estimated Minimum Water Supply  
(Based on Driest 3-Year Historic Sequence)  
(AF)**

Source	Normal Base Year	Multiple Dry Year		
	2006	2006	2007	2008
Local Supplies	740	960	960	960
Imported Supply	550	540	540	540
<b>Total</b>	<b>1,290</b>	<b>1,500</b>	<b>1,500</b>	<b>1,500</b>

Source: Table 4.2.2-5; assumes 64% BPP in 2006 through 2008

## 7.4 CATASTROPHIC SUPPLY INTERRUPTION PLAN

### Water Shortage Emergency Response

A water shortage emergency could be catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions.

For catastrophic water supply interruptions, the District’s Emergency Response Plan outlines the water shortage emergency response responsibilities. The plan provides a step by step procedure for responding to different types of emergencies and also provides detailed contact information for adjoining cities, special districts, and regulatory agencies. The plan is updated on a scheduled basis.

For major emergencies, the District also participates in the Water Emergency Response Organization of Orange County (WEROC). WEROC performs coordination of information and mutual-aid requests among Orange County water agencies, and conducts disaster training exercises for the Orange County water community and with Metropolitan. WEROC also coordinates an effective response to disasters impacting the regional water distribution system. WEROC is unique in its ability to provide a single point of contact for water representation in Orange County during a disaster.

The District also has direct access to Metropolitan’s Member Agency Radio System (MARS) to assist in mutual aid of its member agencies and the water community. Additional emergency services available include the State of California Master Mutual Aid Agreement, California Water Agencies Response Network (WARN) and Plan Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement and is planned out of the California Office of Emergency Services. WARN includes all public agencies that have signed the agreement to WARN and provides mutual aid assistance. It is managed by a State Steering Committee. Plan

Bulldozer provides mutual aid for construction equipment to any public agency for the initial time of disaster when danger to life and property exists. Additionally, an Emergency Water Quality Notification Plan, approved by DHS, is annually reviewed and updated.

To meet short-term water demand deficiencies, and short- or long-term drought requirements, EOCWD has implemented its own water shortage policy, *Water Shortage Contingency Plan (Drought Management Program)*, in accordance with MWDOC's procedures in the event of a water shortage, which is in accordance with Metropolitan's adopted WSDM Plan. The WSDM Plan guides the management of regional water supplies to achieve the reliability goals of Southern California's Integrated Water Resource Plan.

## **7.5 PROHIBITIONS, PENALTIES, AND CONSUMPTION REDUCTION METHODS**

EOCWD's Ordinance No. 1991-1 includes general prohibitions of public water use for leaks, runoff, and washing vehicles and equipment. In summary, the general prohibitions require customers to repair all leaks from indoor and outdoor plumbing fixtures; prohibit customers from causing or allowing water to run off landscape areas into adjoining streets, sidewalks, or other paved surfaces; and require the washing of vehicles, trailers, boats, and other types of mobile equipment using a handheld bucket or hose with a positive shutoff nozzle. For the complete detail on EOCWD prohibitions for Phases I- III, refer to Ordinance No. 1991-1, as included in Appendix F.

According to Ordinance No. 1991-1, the EOCWD Board of Directors shall make findings of shortages and declare the applicable water conservation phase by resolution. Metropolitan may raise or lower its water rates, penalties and credits during a proclaimed water shortage. EOCWD will adjust its water rates accordingly.

Phase I prohibits washing sidewalks, driveways, parking areas, or other paved surfaces; watering lawns, landscape or other turf areas except at specified times; using water to clean, fill, or maintain levels in decorative fountains, ponds, lakes, etc.; and serving drinking water to any customer unless requested.

Phase II prohibits violation of Phase I; lawn watering and landscape irrigation unless during specified times; watering lawn, landscape or other turf areas of commercial nurseries or golf course except during specified times; making, causing, using, or permitting the use of water for any purpose in an amount in excess of eighty-five percent (85%) of the amount used on that customer's premises during the corresponding billing period of the base period as determined by the Board of Directors; Filling, refilling or adding water to swimming pools, spas, ponds, and artificial lakes.



Phase III states that no person shall violate provisions of Phase I and II, including the probation of watering of lawns, etc, unless taking place on designated days and times; water use from fire hydrants except for fire fighting and related activities; using water to wash down streets, gutters, sidewalks, etc.; washing of autos, trucks, mobile homes, etc.; filling re-filling or adding of water to swimming pools, spas, etc.; agricultural or commercial nursery purposes; no serving drinking water to any customer unless requested; operation of ornamental fountain; and make, cause, use or permit the use of water for any purpose in excess of eighty percent (80%) of the amount used on the customer premises during the corresponding billing period of the base period as determined by the Board of Directors.

As shown above, Phase III includes consumption reduction methods to reduce demand to 80% of the total water used per account. Further, in a Phase III Water Emergency, each of the water conservation measures included in the ordinance would be strictly enforced, and it is anticipated that collectively this would generate at least a 50% overall water demand reduction through strict enforcement.

As identified in Ordinance No. 1991-1, violation by any customer of the general provisions shall be penalized as follows:

- a) First Violation – Written notice issued to customer.
- b) Second Violation – Surcharge in an amount equal to fifteen percent (15%) of the customers water bill imposed.
- c) Third and Subsequent Violations – Surcharge in the amount of thirty percent (30%) of customer’s water bill will be imposed. Also, a flow restricting device of one (1) gallon per minute capacity for services up to one and one half (1 ½) inch in size and comparatively sized restrictors for larger services, shall be installed. The customer will be charged reasonable costs incurred.

## **7.6 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES DURING SHORTAGES**

The District Retail Zone receives water revenue from a fixed commodity charge (currently \$1.63/ccf), a fixed metered account charge (\$8/month) and a capital recovery charge (\$10/month). The rates have been designed to recover the full cost of water service in the commodity charge. Therefore, the cost of purchasing water and producing groundwater would decrease as the usage or sale of water decreases. Should an extreme shortage be declared and a large reduction in water sales occurs for an extended period of time, EOCWD would reexamine its water rate structure and monitor projected expenditures. If needed, EOCWD would additionally increase rates to overcome revenue lost.

EOCWD will also follow the allocation plan guidelines of MWDOC as adopted by Metropolitan once an extreme shortage is declared. This allocation plan will be enforced by Metropolitan using rate surcharges. MWDOC will follow the guidelines of the

allocation plan and impose the surcharge that Metropolitan applies to its member agencies that exceed their water allocation. EOCWD would correspondingly impose surcharges or penalties in accordance with its ordinance on excessive use of water.

In September 2003, MWDOC partnered with the Orange County Business Council and prepared a report, “*Determining the Value of Water Supply Reliability in Orange County, California.*” The study provides insights into how to value water supply reliability by providing projected estimates of the economic impacts of different water shortages that could result in Orange County. The study does not assess the likelihood of different disruptions to water supply, but instead estimates the economic impacts of the resulting water shortages if a particular supply interruption occurs. Two types of shortages are examined in the study — short-term emergency disruptions and multiple-year droughts. A range of scenarios was examined for both situations. Those scenarios were:

- Emergency Disruptions: Water supply reductions of 20%, 40%, 60% and 80% for 10, 20, 30, and 60 days.
- Drought: Water supply reductions of 5% and 20% for one, two, and three years.

The estimated economic impacts are separated into business impacts and residential impacts. Residential users are often required to reduce their water usage by more than business customers during water shortages to help preserve the economic base of the area. In addition to residential and business impacts, this report also includes an estimate of the value of landscape losses that would be expected during droughts, and a discussion of the impact of emergency outages on damages from firestorms due to a lack of water supply for firefighting.

The study has produced dollar estimates of economic impacts of given water shortages to both the business and residential sectors of three regions within Orange County. The water shortage scenarios analyzed included both short-term emergency disruptions (10 to 60 days in duration) and multiple-year drought situations (1 to 3 years). The three regions of the County analyzed were defined based on the availability of local supplies and the potential risk of supply reliability impacts.

The results revealed that business impacts are larger than residential impacts. For short-term, emergency disruptions, the difference between business impacts and residential impacts varies depending on the magnitude and length of a shortage. For an 80% water loss in South Orange County for 60 days, business impacts are approximately five times as large as residential impacts. For a 20% water loss in the Basin, business impacts are approximately ten times as large as resident impacts. At low levels of water disruption, resident impacts more closely approximate business impacts. For example, the residential impacts from a 20% water loss for 10 days in South Orange County are about 75% of the business impacts from the same disruption.

For all of Orange County during an emergency outage that causes a 20% water supply shortfall and lasts from 10 to 60 days, the economic impacts range from \$0.4 to \$3 billion. Employment losses were estimated at 3,000 to 23,000 over the 10–60 days.

For all of Orange County during a drought that results in a 5% shortage to the Basin area and 20% shortage outside the basin area for a one to three year period, the economic impacts range from \$15 to \$43 billion. Employment losses were estimated at 75,000 to 225,000 over the one to three-year period.

If shortages were to occur:

- South Orange County would experience approximately 12% of the business and employment impacts, but 25% of the residential and landscape losses. South Orange County has a higher dependence on imported water supplies and hence is more vulnerable to supply outages.
- The Orange County Basin would experience 84% of the business impacts and 71% of the residential and landscape losses, but has a significant supply of water available from the groundwater basin and hence is somewhat insulated from imported water supply emergency disruptions.
- Brea/La Habra area would experience about 3% of all impacts.

Drought scenarios generally cause a higher level of impact than do emergency outages and exceed all but the worst-case emergency disruptions. The exception is a 60-day 60% reduction in water supplies to the Basin business sector, which would exceed the impact of a yearlong 5% drought in the Basin. (20% reduction in imported supply assuming a 75% BPP.) In most scenarios, about half of the business losses are in the manufacturing and service sectors. Employment losses are highest in services and retail throughout the County.

This plan demonstrates the extensive importance to the District's water reliability and water shortage contingency plan for planning for the future. If such impacts occur in the residential and business community, the municipal community will be impacted correspondingly. Economic impacts to the community create economic impacts to the District revenue from water sales, among other District revenue sources. The District must and will continue to be diligent in maintaining appropriate water rates and rate structure, and making reasonable adjustments as justified; maintaining sufficient water reserve funds; and managing expenses accordingly.

## **7.7 WATER SHORTAGE CONTINGENCY ORDINANCE AND DRAFT WATER SHORTAGE RESOLUTION**

EOCWD's Ordinance No. 1991-1 includes general prohibitions of public water use for leaks, runoff, and washing vehicles and equipment. In summary, the general prohibitions require customers to repair all leaks from indoor and outdoor plumbing fixtures; prohibit customers from causing or allowing water to run off landscape areas in to adjoining streets, sidewalks, or other paved surfaces; and require the washing of vehicles, trailers, boats, and other types of mobile equipment using a handheld bucket or hose with a

positive shutoff nozzle. In addition, the Ordinance includes Phasing, which refers to the Board action of declaring water conservation Phase, I, II, or III by resolution.

Further, the Board shall, by resolution, declare a water shortage and adopt a water shortage stage that will be implemented. A copy of the Draft Water Shortage Resolution is included in Appendix G.

## **7.8 MECHANISMS TO DETERMINE ACTUAL REDUCTIONS IN WATER USE**

Under normal conditions, potable water production figures are recorded daily. Weekly and monthly reports are prepared and monitored. This data will be used to measure the effectiveness of any water shortage contingency stage that may be implemented.

As stages of water shortage are declared by Metropolitan, EOCWD will follow implementation of those stages and continue to monitor water demand levels. It is not until Shortage Stage 5 that Metropolitan may call for extraordinary conservation. During this stage, Metropolitan's Drought Program Officer will coordinate public information activities and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided.

The District will participate in monthly member agency manager meetings with both MWDOC and OCWD to monitor and discuss monthly water allocation. This will enable the District to be aware of import water use and groundwater conditions on a timely basis as a result of specific actions taken responding to the District's Water Shortage Contingency Plan.

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## **SECTION 8 WATER RECYCLING**

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### **8.1 RECYCLED WATER IN SOUTHERN CALIFORNIA**

The Southern California region, from Ventura to San Diego, discharges over 1 billion gallons (1.1 million AFY) of treated wastewater to the ocean each day. This is considered a reliable and drought-proof water source and could be utilized to greatly reduce southern California's reliance on imported water. As technological improvements continue to reduce treatment cost, and as public perception and acceptance continue to improve, numerous reuse opportunities should develop. Recycled water is a critical part of the California water picture because of the strong drought potential and as technology continues to improve, demand continues to increase for its use.

### **8.2 COORDINATION OF RECYCLED WATER IN EOCWD SERVICE AREA**

EOCWD currently does not utilize or serve recycled water to any of its customers or for municipal uses. However, EOCWD supports efforts of the regional water management agencies to produce and use recycled water as a primary resource for groundwater recharge in Orange County. Since EOCWD Retail Zone currently receives approximately 64 percent, and is projected to increase, of its water supply from groundwater, it indirectly uses and benefits from recycled water.

#### **Regional Recycled Water Planning**

Recycled water in Orange County is used to irrigate crops, golf courses, parks, schools, business landscapes, residential lawns, and some industrial uses. Recycled water is also being planned to be the primary resource for groundwater recharge in Orange County.

In 2005, nearly 30,000 AF of recycled water was applied by water retailers in the County. In addition, recycled water has played a significant part in the Orange County groundwater basin by being utilized as a barrier to saltwater intrusion; 4,000 AF in 2005.

OCSD produces recycled water year round for OCWD's Green Acres Project (GAP), providing recycled water for industrial customers and landscape irrigation in Fountain Valley, Santa Ana, Costa Mesa, and Newport Beach. It also produces recycled water for OCWD's Groundwater Injection System. The OCWD/OCSD proposed Groundwater Replenishment System (GWRS) would increase the use of recycled water for groundwater recharge over the next 20 years by 119 percent.

Recycled water use and projections in Orange County can be found in the MWDOC's 2005 Regional Urban Water Management Plan. The projections for expanded development of water recycling are based upon several "institutional assumptions" that vary depending on the end use of the recycled water. Development of recycled water

projects generally requires creative solutions to funding, regulatory requirements, institutional arrangements and public acceptance.

Determining the technical and economic feasibility of a recycled water project requires a relative comparison to alternative water supply options. This comparison entails a detailed analysis of the costs and benefits of each alternative supply. A detailed discussion of the methods and issues in determining the relative cost effectiveness of recycled water projects is described in the draft "Urban Water Recycling Feasibility Assessment Guidebook," Section 3 (California Urban Water Agencies, September 1998).

In 1993, DWR, in cooperation with the USBR and seven southern California water agencies, including Metropolitan, undertook a study to evaluate the feasibility of a regional water reclamation plan. The Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS) was a six-year effort to identify regional reclamation systems, and promote efficient use of total water resources by increasing the use of recycled water and identifying opportunities for and constraints to maximizing water reuse in Southern California.

Based upon the 2002 Executive Summary of the SCCWRRS Final Report, a regional water recycling system that spans the entire study area is not practical or feasible; however, subregional systems warrant further evaluation. Orange County and the Lower Santa Ana River Watershed has been identified as one of the four geographical regions, and is being examined for a regional water recycling system for short-term (2010) and long-term (2040) applications. Additional information on this study has been referenced in MWDOC's and Metropolitan's 2000 Regional Urban Water Management Plans. The DWR, Division of Planning and Local Assistance, web site also presents information on the SCCWRRS.

OCWD is planning large increases in indirect recycling. The amount of treated wastewater in the Santa Ana River is projected to increase due to population growth in Riverside and San Bernardino Counties. OCWD and OCSD's proposed GWRS program is a single recharge project that could ultimately supply 120,000 AFY that is currently lost to the ocean.

### **OCWD/OCSD Groundwater Replenishment System (GWRS)**

The GWRS is a jointly funded project of OCWD and OCSD. The GWRS is a water supply project designed to ultimately reuse approximately 110,000 AFY of advanced treated wastewater. The first phase is currently underway and is scheduled to go online in 2007. The first phase anticipates treating 61,000 AFY in 2007/08, 68,000 AFY in 2008/09, and eventually 72,000 AFY.<sup>63</sup> Timing of future phases will be determined by projected flow requirements for anticipated water demands.

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<sup>63</sup> Orange County Water District, Long Term Facilities Plan, Draft October 2005.

The objective of the project is to develop a new source of reliable, high quality, low salinity water that will be used to replenish the groundwater basin and expand the existing seawater intrusion barrier. The GWRS would supplement existing water supplies, and provide a new, cost-effective and reliable source of water to recharge the Orange County Groundwater Basin, protect the Basin from further degradation due to seawater intrusion, and augment the supply of recycled water for irrigation and industrial use. Thus, the GWRS is comprised of three major components: (1) Advanced Water Purification Facilities (AWPF) and pumping stations; (2) a major pipeline connecting the treatment facilities to existing recharge basins; and (3) expansion of an existing seawater intrusion barrier.

The GWRS will take secondary, treated municipal wastewater from the OCSD Treatment Plant No. 1 in Fountain Valley and further clean this water to levels that exceed current drinking water standards. This will allow it to be used for groundwater recharge, injection into the seawater barrier, and for landscape irrigation and industrial process water, rather than having to discharge it into the Pacific Ocean.

A portion of the treated product water will be pumped upstream via a major conveyance pipeline generally paralleling the Santa Ana River to the OCWD spreading basins where it will be allowed to percolate into the Orange County Groundwater Basin. However, most of the treated water will also be injected into the ground to create an expanded seawater intrusion barrier.

A small portion of the treated water will be made available to supplement the irrigation demands of OCWD's existing Green Acres Project. Some of the treated water may also be made available for use as industrial process water, irrigation water or for other approved uses via connections to the major conveyance pipeline in industrial areas, business parks, golf courses, and parks located near the Santa Ana River alignment.

Some of the benefits of the proposed GWRS to EOCWD, MWDOC's service area, and all of Orange County and California include:

- Supply a significant amount of highly treated recycled water required by OCWD to maintain a high basin production percentage through and beyond the year 2020.
- Provide a reliable replenishment water supply in times of drought.
- Expand the seawater intrusion barrier to sustain additional groundwater production in the coastal zone.

Detailed discussion on the proposed GWRS can be found in the MWDOC 2005 Regional UWMP and the OCWD 2020 Master Plan Report.



### **8.3 WASTEWATER COLLECTION AND TREATMENT IN EOCWD SERVICE AREA**

OCSD is a “special district,” single purpose entity formed solely for the processing and disposal or reuse of wastewater and its residuals. The District serves a population of approximately 2.3 million people living in a 471 square mile area that encompasses the majority of metropolitan Orange County, including 23 of the County’s 34 cities. During 2002, an average daily sewage influent rate of 236 MGD was treated and was estimated in an amount of 542 wet tons per day of biosolids were produced.<sup>64</sup>

OCSD operates the third largest wastewater system on the west coast, consisting of nearly 600 miles of trunk sewers and 200 miles of subtrunk sewers, two regional treatment plants, and an ocean disposal system.

#### ***Wastewater Collection and Treatment***

Wastewater from EOCWD’s retail water service area is collected and treated by OCSD. The cities in which the District serves operate and maintain the localized sewer systems that feed into OCSD’s trunk system from the service area.

The wastewater flow generated from within EOCWD boundaries is directed to OCSD’s Reclamation Plant No. 1, which is located in Fountain Valley about 4 miles northeast of the ocean and adjacent to the Santa Ana River. The plant provides advanced primary and secondary treatment and supplies secondary treatment water to OCWD, which further treats and distributes the water for various uses, including irrigation, groundwater recharge, and operation of the coastal seawater barrier system. Wastewater flows generated from within EOCWD could also be diverted to OCSD Plant No. 2 if deemed necessary.

The treatment process at Reclamation Plant No. 1 includes secondary treatment through an activated sludge system. This plant receives raw wastewater from six major sewer pipes, often called “interceptors” or “trunk lines.” The secondary effluent is either blended with the advanced primary effluent and routed to the ocean disposal system, or is sent to the OCWD facility for advanced treatment and recycling. The solid materials removed in the treatment systems are processed in large tanks to facilitate natural decomposition. Half of the material is converted to methane, which is burned as fuel in the energy recovery system, and the remaining solids are used as a soil amendment or fertilizer in Kern, Kings, Riverside, and San Diego counties.

OCSD’s Treatment Plant No. 2 is located adjacent to the Santa Ana River and about 1,500 feet from the ocean. This plant provides a mix of advanced primary and secondary treatment. The plant receives raw wastewater through five major sewers. The treatment process is similar to Plant No. 1. Approximately 33 percent of the influent receives secondary treatment through an activated sludge system, and all of the effluent is discharged to the ocean disposal system.

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<sup>64</sup> Orange County Sanitation District, Annual Report: Operations and Maintenance, October 2002.

As previously noted, wastewater flows generated from within EOCWD are directed to OCSD Reclamation Plant No. 1. Current average daily flow of wastewater received at Plant No. 1 is 88 million gallons per day (mgd) of wastewater, with a primary treatment capacity of 108 mgd. Table 8.3-1 projects the treated wastewater discharged to the ocean from Treatment Plant No. 1.

**Table 8.3-1**  
**RP-1 Wastewater Discharged to the Ocean**  
(AFY)

Year	Wastewater Discharged to the Ocean
2005	80,614
2010	35,828
2015	56,982
2020	39,187
2025	39,187
2030	39,187

Source: MWDOC 2005 Regional UWMP

Current capacity for Reclamation Plant No. 1 is 218 mgd of wastewater, with an average day flow of 120 mgd.<sup>65</sup> The City provides significant amount of wastewater to OCSD Reclamation Plant No. 1. The quantities of wastewater generated are generally proportional to the population and the water use in the service area. Estimates of the wastewater flows in the EOCWD service area are included in Table 8.3-2. The wastewater flows were calculated using the population projections included in Section 1.

**Table 8.3-2**  
**Wastewater Generated Within EOCWD**  
(AFY)

Year	Unit Flow Coefficient (gpcd) <sup>1</sup>	Wastewater Generated by EOCWD
2005	106	10,686
2010	109	11,758
2015	112	12,521
2020	115	13,152
2025	115	13,281
2030	115	13,320

<sup>1</sup> The OCSD Interim Strategic Plan Update, September 2002. Years 2025 and 2030 were assumed to be the same as 2020.

<sup>65</sup> MWDOC 2005 Regional Urban Water Management Plan.

## **8.4 EOCWD RECYCLED WATER PLANNING**

### **8.4.1 Potential Uses of Recycled Water**

While the District recognizes the potential uses of recycled water in its community, such as landscape irrigation, parks, and other uses, the District does not have the recycled water infrastructure to support the use of recycled water. The community is essentially built-out. The preliminary cost-effectiveness analyses that have been conducted throughout the years regarding recycled water infrastructure have not shown beneficial. Therefore, the District supports, encourages and contributes to the continued development of recycled water and potential uses throughout the region.

As specifically described above and in section 4.1 Reliability of Water Supplies, the GWRS is substantially the largest recycled water project in the region. The GWRS will develop a new source of reliable, high quality, low salinity water that will be used to replenish the groundwater basin, expand the existing seawater intrusion barrier, and augment the supply of recycled water for irrigation and industrial use.

- GWRS water will be substantially cheaper than water produced by seawater desalination. Desalinated water costs range between \$800 and \$1,300 an acre-foot to produce, while the GWRS can produce high-quality water for approximately \$476 an acre-foot (it should be noted that this cost is subsidized by the project owners at a rate of approximately \$750/AF).
- Rate increases associated with droughts, a recurring phenomenon in Southern California, will be lessened because the GWRS water is drought-proof.
- A comprehensive cost-benefit analysis determined that the GWRS produced greater benefits than expanding Water Factory 21 and increasing purchases of imported water, a commonly cited alternative to the GWRS.

The District may indirectly reuse water and even purify ocean water as the cost becomes competitive with other forms of "new" water.

### **8.4.2 Projected Recycled Water Use**

The District's Retail System will indirectly use recycled water as it pumps groundwater. OCWD projects the use of groundwater for the water year 2004 -2005 to be 316,000 AF. The District's Retail System produced approximately 642 AF from the Orange County groundwater basin in 2004-05. As the GWRS comes on line, the District will continue to draw water from the basin at approximately the same ratio in order to take advantage of blending and seasonal cost advantages. The long range improvements (mineral reductions) of the GWRS for the groundwater basin are unknown; therefore, it is not expected that direct reuse projects will be pursued by the District.

### **8.4.3 2000 Projection Comparison to 2005 Actual Recycled Water Use**

The District currently does not utilize or serve directly applied recycled water to any of its customers or for municipal uses, and does not project any recycled water use for subsequent years.

### **8.4.4 Encouraging Recycled Water Use**

Recent studies of water recycling opportunities within southern California provide a context for promoting the development of water recycling plans. It is recognized that broad public acceptance of recycled water requires public education and involvement.

#### ***Public Education***

EOCWD participates in MWDOC's public education and school education programs, which include extensive sections on water recycling. MWDOC's water use efficiency public information programs are a partnership with EOCWD and other agencies.

Through a variety of public information programs, MWDOC assists EOCWD in reaching the public with accurate information regarding present and future water supplies, the demands for a suitable quantity and quality of water, including recycled water, and the importance of implementing water efficient techniques and behaviors. Through MWDOC, water education programs have reached thousands of Tustin students with grade-specific programs that include information on recycled water.

Current programs include the Drinking Water Festival held annually during the month of May sponsored by OCWD and the Blue Planet Foundation.

#### ***Financial Incentives***

The implementation of recycled water projects involves a substantial upfront capital investment for planning studies, environmental impact reports, engineering design and construction before there is any recycled water to market. For some water agencies, these capital costs exceed the short-term expense of purchasing additional imported water supplies from Metropolitan even though a regional analysis in the SCCCWRRS shows that net benefits are far greater than direct costs.

Funding sources are available through federal, state and regional programs to provide significant financial incentives for local agencies to develop and make use of recycled water. These funding sources include the USBR, California water bonds, and Metropolitan's Local Resources Program. These funding opportunities may be sought by EOCWD or possibly more appropriately by other regional agencies. EOCWD will continue to support seeking funding for regional water recycling projects and programs. More detail on these funding programs can be found in the MWDOC 2005 Regional UWMP.

#### **8.4.5 Optimizing Recycled Water Use**

In Orange County, the majority of recycled water is used for irrigating golf courses, parks, schools, business and communal landscaping. However, future recycled water use can increase by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pumping stations and transmission mains to reach areas far from the treatment plants. Gains in implementing some of these projects have been made throughout the county, while efforts continue to manage the large energy requirements, facilities, and additional costs to make the water recycling projects economically feasible.

To optimize the use of recycled water, cost/benefit analysis must be conducted for each potential project. Once again, this brings about the discussion on technical and economic feasibility of a recycled water project requiring a relative comparison to alternative water supply options. For EOCWD, analysis has shown capital costs exceed the short-term and long-term expense of purchasing additional imported water supplies from Metropolitan through MWDOC.

EOCWD will continue support and collaborate with regional planning efforts relating to the costs and associated benefits for recycled water projects, and seek creative solutions and a balance to recycled water use, in coordination with MWDOC, OCWD, Metropolitan and other cooperative agencies. These include solutions for funding, regulatory requirements, institutional arrangements, public acceptance, and innovative recycled water projects.

APPENDIX A

***CALIFORNIA URBAN WATER MANAGEMENT  
PLANNING ACT OF 1983 AS AMENDED TO 2005***

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**Established:** AB 797, Klehs, 1983

**Amended:** AB 2661, Klehs, 1990

AB 11X, Filante, 1991

AB 1869, Speier, 1991

AB 892, Frazee, 1993

SB 1017, McCorquodale, 1994

AB 2853, Cortese, 1994

AB 1845, Cortese, 1995

SB 1011, Polanco, 1995

AB 2552, Bates, 2000

SB 553, Kelley, 2000

SB 610, Costa, 2001

AB 901, Daucher, 2001

SB 672, Machado, 2001

SB 1348, Brulte, 2002

SB 1384, Costa, 2002

SB 1518, Torlakson, 2002

AB 105, Wiggins, 2004

SB 318, Alpert, 2004

## **CALIFORNIA WATER CODE DIVISION 6 PART 2.6. URBAN WATER MANAGEMENT PLANNING**

### **CHAPTER 1. GENERAL DECLARATION AND POLICY**

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

- (1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
- (2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- (3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
- (4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
- (5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
- (6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require



- specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
- (7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
- (8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
- (9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

- (a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
- (b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
- (c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

## **CHAPTER 2. DEFINITIONS**

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and

practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

### **CHAPTER 3. URBAN WATER MANAGEMENT PLANS**

#### **Article 1. General Provisions**

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(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.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall 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.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall 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. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

### **Article 2. Contents of Plans**

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

- (1) An average water year.
- (2) A single dry water year.
- (3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

- (A) Single-family residential.
- (B) Multifamily.
- (C) Commercial.

- (D) Industrial.
  - (E) Institutional and governmental.
  - (F) Landscape.
  - (G) Sales to other agencies.
  - (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
  - (I) Agricultural.
- (2) The water use projections shall be in the same five-year increments described in subdivision (a).
- (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
- (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:
    - (A) Water survey programs for single-family residential and multifamily residential customers.
    - (B) Residential plumbing retrofit.
    - (C) System water audits, leak detection, and repair.
    - (D) Metering with commodity rates for all new connections and retrofit of existing connections.
    - (E) Large landscape conservation programs and incentives.
    - (F) High-efficiency washing machine rebate programs.
    - (G) Public information programs.
    - (H) School education programs.
    - (I) Conservation programs for commercial, industrial, and institutional accounts.
    - (J) Wholesale agency programs.
    - (K) Conservation pricing.
    - (L) Water conservation coordinator.
    - (M) Water waste prohibition.
    - (N) Residential ultra-low-flush toilet replacement programs.
  - (2) A schedule of implementation for all water demand management measures proposed or described in the plan.
    - (3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
    - (4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
  - (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the

evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies.

This evaluation shall do all of the following:

- (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
- (2) Include a cost-benefit analysis, identifying total benefits and total costs.
- (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
- (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon

water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

- (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.
- (b) 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's water supply.
- (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
- (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
- (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
- (f) Penalties or charges for excessive use, where applicable.
- (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
- (h) A draft water shortage contingency resolution or ordinance.
- (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, 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.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.



## **Article 2.5 Water Service Reliability**

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

## **Articl 3. Adoption and Implementation of Plans**

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the 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. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.

After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

#### **CHAPTER 4. MISCELLANEOUS PROVISIONS**

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation

and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

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APPENDIX B

***2005 URBAN WATER MANAGEMENT PLAN  
“REVIEW FOR COMPLETENESS” FORM***

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**2005 Urban Water Management Plan "Review for Completeness" Form**  
**For DWR Review Staff Use**

**Coordination with Appropriate Agencies (Water Code § 10620 (d)(1)(2))**

- Yes  
 Participated in area, regional, watershed or basin wide plan East Orange County Sec 1, p.1-2 Reference & Page Number  
 Name of plan 2005 UWMP Lead Agency Water District (Wholesale) Sec 1, p.1-2 Reference & Page Number  
 Describe the coordination of the plan preparation and anticipated benefits. Sec 1, p.1-2 Reference & Page Number

Table 1 Coordination with Appropriate Agencies							
Check at least one box on each row	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not Involved / No Information
EOCWD staff	X	X	X	X	X	X	
MWDOC				X			
OCWD				X		X	
EOCWD sub-agencies		X	X	X			
MWD of So. Calif.		X		X		X	

**Describe resource maximization / import minimization plan (Water Code §10620 (f))**

- Describe how water management tools / options maximize resources & minimize need to import water Sec 2, p.2-5 Reference & Page Number

**Plan Updated in Years Ending in Five and Zero (Water Code § 10621(a))**

- Date updated and adopted plan received DWR to enter (enter date) Sec 1, p.1-2 Reference & Page Number

**City and County Notification and Participation (Water Code § 10621(b))**

- Notify any city or county within service area of UWMP of plan review & revision Sec 1, p.1-2 Reference & Page Number  
 Consult and obtain comments from cities and counties within service area Sec 1, p.1-2 Reference & Page Number

**Service Area Information Water Code § 10631 (a))**

- Include current and projected population Sec 1, p.1-9 Reference & Page Number  
 Population projections were based on data from state, regional or local agency Sec 1, p.1-11 Reference & Page Number



Table 2 Population - Current and Projected						
	2005	2010	2015	2020	2025	2030 - opt
<b>Service Area Population</b>	90,000	96,300	99,800	102,100	103,100	103,400

- 
- 

Describe climate characteristics that affect water management  
 Describe other demographic factors affecting water management

Sec 1, p.1-5 Reference & Page Number  
Sec 1, p.1-5 Reference & Page Number

Table 3 Climate						
	January	February	March	April	May	June
<b>Standard Average ETo</b>	1.86	2.24	3.41	4.8	5.58	6.3
<b>Average Rainfall</b>	2.53	2.73	2.21	1.01	0.26	0.07
<b>Average Temperature</b>	53.8	55.3	56.9	60.3	63.8	67.4

Table 3 (continued) Climate							
	July	August	September	October	November	December	Annual
<b>Average ETo</b>	6.51	6.2	4.8	3.72	2.4	1.86	<b>49.7</b>
<b>Average Rainfall</b>	0.01	0.08	0.27	0.36	1.32	1.99	<b>12.84</b>
<b>Average Temperature</b>	71.6	72.5	70.9	65.8	59.2	54.5	<b>62.7</b>

Water Sources		(Water Code § 10631 (b))
<input checked="" type="checkbox"/>	Identify existing and planned water supply sources	<u>Sec 2, p.2-1</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provide current water supply quantities	<u>Sec 2, p.2-5</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provide planned water supply quantities	<u>Sec 2, p.2-5</u> Reference & Page Number

Table 4 Current and Planned Water Supplies - AFY						
Water Supply Sources	2005	2010	2015	2020	2025	2030 - opt
<b>Water purchased from:</b>						
<b>Metropolitan Water District of Orange County through Municipal Water District of Orange County - Imported</b>	10,515	4,850	4,960	5,020	5,050	5,060
<b>Total</b>	<b>10,515</b>	<b>4,850</b>	<b>4,960</b>	<b>5,020</b>	<b>5,050</b>	<b>5,060</b>

If Groundwater identified as existing or planned source		(Water Code §10631 (b)(1-4))
<input type="checkbox"/>	Has management plan	_____ Reference & Page Number
<input type="checkbox"/>	Attached management plan (b)(1)	_____ Reference & Page Number
<input type="checkbox"/>	Description of basin(s) (b)(2)	_____ Reference & Page Number
<input type="checkbox"/>	Basin is adjudicated	_____ Reference & Page Number
<input type="checkbox"/>	If adjudicated, attached order or decree (b)(2)	_____ Reference & Page Number
<input type="checkbox"/>	Quantified amount of legal pumping right (b)(2)	_____ Reference & Page Number

Table 5 Groundwater Pumping Rights - AF Year	
Basin Name	Pumping Right - AFY
<i>Not for Wholesale part of EOCWD, only for Retail</i>	
<b>Total</b>	<b>0</b>

<input type="checkbox"/>	DWR identified, or projected to be, in overdraft (b)(2)	_____ Reference & Page Number
<input type="checkbox"/>	Plan to eliminate overdraft (b)(2)	_____ Reference & Page Number
<input type="checkbox"/>	Analysis of location, amount & sufficiency, last five years (b)(3)	_____ Reference & Page Number
<input type="checkbox"/>	Analysis of location & amount projected, 20 years (b)(4)	_____ Reference & Page Number

Table 6 Amount of Groundwater pumped - AFY					
Basin Name (s)	2001	2002	2003	2004	2005
<b>% of Total Water Supply</b>					

Table 7 Amount of Groundwater projected to be pumped - AFY					
Basin Name(s)	2010	2015	2020	2025	2030 - opt
<b>% of Total Water Supply</b>					

**Reliability of Supply**

(Water Code §10631 (c) (1-3))

Describes the reliability of the water supply and vulnerability to seasonal or climatic shortage Sec 4,4-1,38 Reference & Page Number

Table 8 Supply Reliability - AF Year					
Average / Normal Water Year	Single Dry Water Year (2010)	Multiple Dry Water Years			
		Year 1 (2007)	Year 2 (2008)	Year 3 (2009)	Year 4 (2010)
	6,010	6,380	6,250	6,240	6,230
Normal year AF	6,340	6,380	6,360	6,350	6,340
% of Normal	94.8%	100.0%	98.3%	98.3%	98.3%

Table 9 Basis of Water Year Data			
Water Year Type	Year	Source name	Source name
<b>Average Water Year</b>	1922-2004	MWDOC	EOCWD
<b>Single-Dry Water Year</b>	1961	MWDOC	
<b>Multiple-Dry Water Years</b>	1959-1961	MWDOC	

Sec 4, p.4-20 Reference & Page Number

Sec 4, p.4-20 Reference & Page Number

Sec 4, p.4-20 Reference & Page Number

**Water Sources Not Available on a Consistent Basis**

**(Water Code §10631 (c))**

- Describe the reliability of the water supply due to seasonal or climatic shortages Sec 4, p.4-38 Reference & Page Number
- Describe the vulnerability of the water supply to seasonal or climatic shortages Sec 4, p.4-38 Reference & Page Number
- No unreliable sources Sec 4, p.4-38 Reference & Page Number

Table 10 Factors resulting in inconsistency of supply				
Name of supply	Legal	Environmental	Water Quality	Climatic

- Describe plans to supplement or replace inconsistent sources with alternative sources or DMMs \_\_\_\_\_ Reference & Page Number
- No inconsistent sources Sec 4, p.4-1 Reference & Page Number

**Transfer or Exchange Opportunities**

**(Water Code §10631 (d))**

- Describe short term and long term exchange or transfer opportunities Sec 4, p.4-46 Reference & Page Number
- No transfer opportunities \_\_\_\_\_ Reference & Page Number

Table11 Transfer and Exchange Opportunities - AF Year					
Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities
Three connections to the Metropolitan system	<i>No planned transfer or exchanges</i>				
Two interconnections with the City of Orange	<i>No planned transfer or exchanges</i>				
<b>Total</b>			0		0

**Water Use Provisions**

**(Water Code §10631 (e)(1)(2))**

- 
- 
- 

Quantify past water use by sector  
 Quantify current water use by sector  
 Project future water use by sector

Sec 5, p.5-1 Reference & Page Number  
Sec 5, p.5-1 Reference & Page Number  
Sec 5, p.5-1 Reference & Page Number

TABLE 12 - Past, Current and Projected Water Deliveries						
	2000		2005		2010	
	metered		metered		metered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
<b>Total</b>	0	0	0	0	0	0

TABLE 12 (continued) - Past, Current and Projected Water Deliveries								
	2015		2020		2025		2030 - opt	
	metered		metered		metered		metered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
<b>Total</b>	0	0	0	0	0	0	0	0

- 
- 

Identify and quantify sales to other agencies  
 No sales to other agencies

Sec 2, p.2-6 Reference & Page Number  
                                 Reference & Page Number

Table 13 Sales to Other Agencies - AF Year							
Water Distributed	2000	2005	2010	2015	2020	2025	2030 - opt
<b>EOCWD Retail</b>	433.8	383.8	290	300	300	300	310
<b>City of Orange</b>	71.7	711.5	360	370	380	380	380
<b>City of Tustin</b>	5,314.8	7,756.6	2,400	2,450	2,480	2,490	2,490
<b>Orange Park Acres Mutual</b>	541.5	288.7	300	310	310	320	320
<b>Golden State Water Company</b>	1,547.4	1,374.5	1,500	1,530	1,550	1,560	1,560
<b>Total</b>	7,909.2	10,515.1	4,850	4,960	5,020	5,050	5,060

Identify and quantify additional water uses

\_\_\_\_\_ Reference &amp; Page Number

Table 14 Additional Water Uses and Losses - AF Year							
Water Use	2000	2005	2010	2015	2020	2025	2030 - opt
Unaccounted-for system losses							
<b>Total</b>	0	0	0	0	0	0	0

Any recycled water was included in table 12 should not be included in table 14.

Table 15 Total Water Use - AF Year							
Water Use	2000	2005	2010	2015	2020	2025	2030 - opt
<b>Total of Tables 12, 13, 14</b>	7,909	10,515	4,850	4,960	5,020	5,050	5,060

**2005 Urban Water Management Plan "Review of DMMs for Completeness" Form****(Water Code §10631 (f))**

(Water Code §10631 (f) &amp; (g), the 2005 Urban Water Management Plan "Review of DMMs for Completeness" Form is found on Sheet 2)

**Planned Water Supply Projects and Programs, including non-implemented DMMs****(Water Code §10631 (g))**

No non-implemented / not scheduled DMMs

Sec 6, p.6-1

Reference &amp; Page Number

Cost-Benefit includes economic and non-economic factors (environmental, social, health, customer impact, and technological factors)

\_\_\_\_\_

Reference &amp; Page Number

Cost-Benefit analysis includes total benefits and total costs

\_\_\_\_\_

Reference &amp; Page Number

Identifies funding available for Projects with higher per-unit-cost than DMMs

\_\_\_\_\_

Reference &amp; Page Number

Identifies Suppliers' legal authority to implement DMMs, efforts to implement the measures and efforts to identify cost share partners

Sec 6, p.6-1

Reference &amp; Page Number

Table 16 Evaluation of unit cost of water resulting from non-implemented / non-scheduled DMMs and planned water supply project and programs	
Non-implemented & Not Scheduled DMM / Planned Water Supply Projects (Name)	Per-AF Cost (\$)

**Planned Water Supply Projects and Programs**

**(Water Code §10631 (h))**

- No future water supply projects or programs
- Detailed description of expected future supply projects & programs Sec. 4,4-38+ Reference & Page Number
- Timeline for each proposed project Sec. 4,4-38+ Reference & Page Number
- Quantification of each projects normal yield (AFY) Sec. 4,4-38+ Reference & Page Number
- Quantification of each projects single dry-year yield (AFY) \_\_\_\_\_ Reference & Page Number
- Quantification of each projects multiple dry-year yield (AFY) \_\_\_\_\_ Reference & Page Number

Project Name	Projected Start Date	Projected Completion Date	Normal-year AF to agency	Single-dry year yield AF	Multiple-Dry-Year 1 AF	Multiple-Dry-Year 2 AF	Multiple-Dry-Year 3 AF

**Opportunities for development of desalinated water**

**(Water Code §10631 (i))**

- Describes opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply Sec. 4, p.4-46 Reference & Page Number
- No opportunities for development of desalinated water \_\_\_\_\_ Reference & Page Number

Sources of Water	Check if yes
<b>Ocean Water (by Metropolitan and others)</b>	X
<b>Brackish ocean water</b>	
<b>Brackish groundwater</b>	

**District is a CUWCC signatory****(Water Code § 10631 (j))**

Urban suppliers that are California Urban Water Conservation Council members may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

The supplier's CUWCC Best Management Practices Report should be attached to the UWMP.

- |                                     |   |   |
|-------------------------------------|---|---|
| <input checked="" type="checkbox"/> | Agency is a CUWCC member                                      | <u>Sec 6, p.6-1</u> Reference & Page Number         |
| <input type="checkbox"/>            | 2003-04 annual updates are attached to plan                   | <u>                    </u> Reference & Page Number |
| <input type="checkbox"/>            | Both annual updates are considered completed by CUWCC website | <u>                    </u> Reference & Page Number |

**If Supplier receives or projects receiving water from a wholesale supplier****(Water Code §10631 (k))**

- |                                     |  |  |
|-------------------------------------|--|--|
|                                     | Yes  |  |
| <input checked="" type="checkbox"/> | Agency receives, or projects receiving, wholesale water            | <u>Sec 4. p.4-22</u> Reference & Page Number |
| <input checked="" type="checkbox"/> | Agency provided written demand projections to wholesaler, 20 years | <u>Sec 4. p.4-22</u> Reference & Page Number |

Table 19 Agency demand projections provided to wholesale suppliers - AFY					
Wholesaler	2010	2015	2020	2025	2030 - opt
Municipal Water District of Southern California	4,850	4,960	5,020	5,050	5,060
Total	4,850	4,960	5,020	5,050	5,060

- |                                     |  |  |
|-------------------------------------|--|--|
| <input checked="" type="checkbox"/> | Wholesaler provided written water availability projections, by source, to agency, 20 years<br>(if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler) | <u>Sec 4. p.4-22</u> Reference & Page Number |
|-------------------------------------|--|--|

Table 20 Wholesaler identified & quantified the existing and planned sources of water- AFY					
Wholesaler sources	2010	2015	2020	2025	2030 - opt
Municipal Water District of Orange County from MWD of So. California	6,340	6,280	6,700	6,340	5,970
(source 2)					
(source 3)					



Reliability of wholesale supply provided in writing by wholesale agency

Sec 4, p.4-17 Reference & Page Number

(if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 21 Wholesale Supply Reliability - % of normal AFY					
Wholesaler sources	Multiple Dry Water Years				
	Single Dry	Year 1	Year 2	Year 3	Year 4
Municipal Water District of Southern California - Imported	105.5%	106.7%	103.7%	105.5%	
(source 2)					
(source 3)					

Table 22 Factors resulting in inconsistency of wholesaler's supply				
Name of supply	Legal	Environment	Water Quality	Climatic

**Water Shortage Contingency Plan Section****(Water Code § 10632)****Stages of Action****(Water Code § 10632 (a))**

Provide stages of action

Sec 7, p.7-1 Reference & Page Number

Provide the water supply conditions for each stage

Sec 7, p.7-1 Reference & Page Number

Includes plan for 50 percent supply shortage

Sec 7, p.7-5 Reference & Page Number

Table 23 Water Supply Shortage Stages and Conditions RATIONING STAGES		
Stage No.	Water Supply Conditions	% Shortage
Phase 1	Basic conservation measures	
Phase 2	Prohibits violation of Phase 1 and 85% excess water use	
Phase 3	Prohibits violation of Phase 1,2 and 80% excess water use	

**Three-Year Minimum Water Supply****(Water Code §10632 (b))**

- Identifies driest 3-year period
- Minimum water supply available by source for the next three years

Sec 4, p.4-16 Reference & Page Number  
Sec 7, p.7-3 Reference & Page Number

Table 24 Three-Year Estimated Minimum Water Supply - AF Year				
source**	Normal Base Year	Multiple Dry Years		
	2006	2006	2007	2008
Local Supplies	0	0	0	0
Imported Supply	6,390	6,270	6,270	6,270
<b>Total</b>	<b>6,390</b>	<b>6,270</b>	<b>6,270</b>	<b>6,270</b>

\*Note: If reporting after 2005, please change the column headers (Year 1, 2, & 3) to the appropriate years

**Preparation for catastrophic water supply interruption****(Water Code §10632 (c))**

- Provided catastrophic supply interruption plan

Sec 7, p.7-4 Reference & Page Number

Table 25 Preparation Actions for a Catastrophe	
Possible Catastrophe	Check if Discussed
Regional power outage	X
Earthquake	X

**Prohibitions**

**(Water Code § 10632 (d))**

List the mandatory prohibitions against specific water use practices during water shortages

Sec 7, p.7-5

Reference & Page Number

Table 26 Mandatory Prohibitions	
Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Washing of sidewalks, driveways, parking area	Phase 1,2,3
Lawn watering & landscape irrigation	Phase 1,2,3
Refilling fountains, ponds, lakes	Phase 1,2,3
Restaurant water service unless requested	Phase 1,3
Water use in excess amount of 85%	Phase 2
Use of water from fire hydrants	Phase 3
Washing of autos, trucks, trailers	Phase 3
Agricultural users and commercial nurseries	Phase 3
Water use in excess amount of 80%	Phase 3

**Consumption Reduction Methods**

**(Water Code § 10632 (e))**

List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction.

Sec 7, p.7-5

Reference & Page Number

Table 27 Consumption Reduction Methods		
Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Prohibits washing all paved surfaces; watering turf areas during specified times only; prohibits water use for fountains, ponds, lakes; and no serving drinking water to customers unless requested.	Phase I	Voluntary actions, expected reductions
Phase I methods, as well as irrigation of commercial nurseries, golf courses, and an additional reduction of 15%.	Phase II	15%
Phase II methods, and additional reduction to at least 20% or more.	Phase III	20-50%

**Penalties**

**(Water Code § 10632 (f))**

List excessive use penalties or charges for excessive use

Sec 7, p.7-5

Reference & Page Number

Table 28 Penalties and Charges	
Penalties or Charges	Stage When Penalty Takes Effect
Written notice issued to customer	First Violation
Surcharge of 15% of customers bill	Second Violation
Surcharge of 30% of customers bill, installation of flow restricting device	Third Violation

**Revenue and Expenditure Impacts**

**(Water Code § 10632 (g))**

<input checked="" type="checkbox"/>	Describe how actions and conditions impact revenues	<u>Sec 7, p.7-6</u> Reference & Page Number
<input checked="" type="checkbox"/>	Describe how actions and conditions impact expenditures	<u>Sec 7, p.7-6</u> Reference & Page Number
<input checked="" type="checkbox"/>	Describe measures to overcome the revenue and expenditure impacts	<u>Sec 7, p.7-6</u> Reference & Page Number

Table 29 Proposed measures to overcome revenue impacts	
Names of measures	Check if Discussed
Rate adjustment	X
Development of reserves	

Table 30 Proposed measures to overcome expenditure impacts	
Names of measures	Check if Discussed
Monitor projected expenditures	X
Rate surcharges	X

**Water Shortage Contingency Ordinance/Resolution****(Water Code § 10632 (h))** Attach a copy of the draft water shortage contingency resolution or ordinance.Sec 7, p.7-8 Reference & Page Number**Reduction Measuring Mechanism****(Water Code § 10632 (i))** Provided mechanisms for determining actual reductionsSec 7, p.7-9 Reference & Page Number

Table 31 Water Use Monitoring Mechanisms	
Mechanisms for determining actual reductions	Type data expected (pop-up?)
Daily/Weekly/Monthly Reports	Estimated water savings
Drought Program Officer activities	Monitored effectiveness

**Recycling Plan Agency Coordination****Water Code § 10633** Describe the coordination of the recycling plan preparation information to the extent available.Sec 8, p.8-1 Reference & Page Number

Table 32 Participating agencies	
	participated
<b>Water agencies</b>	
<b>Wastewater agencies</b>	OCSD
<b>Groundwater agencies</b>	OWSD
<b>Planning Agencies</b>	

**Wastewater System Description****(Water Code § 10633 (a))** Describe the wastewater collection and treatment systems in the supplier's service areaSec 8, p.8-4 Reference & Page Number Quantify the volume of wastewater collected and treatedSec 8, p.8-4 Reference & Page Number

Table 33 Wastewater Collection and Treatment - AF Year							
Type of Wastewater	2000	2005	2010	2015	2020	2025	2030 - opt
Wastewater collected & treated in service area	N/A	10,686	11,758	12,521	13,152	13,281	13,320
Unit Flow Coefficient (gpcd)		106	109	112	115	115	115

**Wastewater Disposal and Recycled Water Uses**

**(Water Code § 10633 (a - d))**

<input checked="" type="checkbox"/>	Describes methods of wastewater disposal	<u>Sec 8, p.8-4</u>	Reference & Page Number
<input type="checkbox"/>	Describe the current type, place and use of recycled water	<u>                    </u>	Reference & Page Number
<input checked="" type="checkbox"/>	None	<u>Sec 8, p.8-6</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Describe and quantify potential uses of recycled water	<u>Sec 8, p.8-6</u>	Reference & Page Number

Table 34 Disposal of wastewater (non-recycled) AF Year (OCSD RP-1)							
Method of disposal	Treatment Level	2005	2010	2015	2020	2025	2030 - opt
Discharged to Ocean (OCSD)	Primary	80,614	35,828	56,982	39,187	39,187	39,187
<b>Total</b>		<b>80,614</b>	<b>35,828</b>	<b>56,982</b>	<b>39,187</b>	<b>39,187</b>	<b>39,187</b>

Table 35 Recycled Water Uses - Actual and Potential (AFY)							
User type	Treatment Level	2005	2010	2015	2020	2025	2030 - opt
Agriculture							
Landscape							
Wildlife Habitat							
Wetlands							
Industrial							
Groundwater Recharge							
Other (user type)							
Other (user type)							
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<input checked="" type="checkbox"/>	Determination of technical and economic feasibility of serving the potential uses	<u>Sec 8, p.8-6</u>	Reference & Page Number
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**Projected Uses of Recycled Water**

**(Water Code § 10633 (e))**

Projected use of recycled water, 20 years

Sec 8, p.8-5 Reference & Page Number

Table 36 Projected Future Use of Recycled Water in Service Area - AF Year					
	2010	2015	2020	2025	2030 - opt
Projected use of Recycled Water					

Compare UWMP 2000 projections with UWMP 2005 actual (§ 10633 (e))

Reference & Page Number

None

Sec 8, p.8-7 Reference & Page Number

Table 37 Recycled Water Uses - 2000 Projection compared with 2005 actual - AFY		
User type	2000 Projection for 2005	2005 actual use
Agriculture		
Landscape		
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Other (user type)		
Other (user type)		
<b>Total</b>	0	0

**Plan to Optimize Use of Recycled Water**

**(Water Code § 10633 (f))**

Describe actions that might be taken to encourage recycled water uses  
Describe projected results of these actions in terms of acre-feet of recycled water used per year

Sec 8, p.8-6 Reference & Page Number

                     Reference & Page Number

Table 38 Methods to Encourage Recycled Water Use					
Actions	AF of use projected to result from this action				
	2010	2015	2020	2025	2030 - opt
Financial incentives					
Public Education					
<b>Total</b>	0	0	0	0	0

- Provide a recycled water use optimization plan which includes actions to facilitate the use of Sec 8, p. 8-7 Reference & Page Number recycled water (dual distribution systems, promote recirculating uses)

**Water quality impacts on availability of supply**

**(Water Code §10634)**

- Discusses water quality impacts (by source) upon water management strategies and supply reliability Sec 3, p.3-9 Reference & Page Number
- No water quality impacts projected

**Table 39**  
**Current & projected water supply changes due to water quality - percentage**

water source	2005	2010	2015	2020	2025	2030 - opt

**Supply and Demand Comparison to 20 Years**

**(Water Code § 10635 (a))**

- Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments. Sec 4, p.4-22 Reference & Page Number

**Table 40**  
**Projected Normal Water Supply - AF Year**

(from table 4)	2010	2015	2020	2025	2030 - opt
<b>Supply</b>	6,340	6,280	6,700	6,340	5,970
% of year 2005	100.0%	100.0%	100.0%	100.0%	100.0%

**Table 41**  
**Projected Normal Water Demand - AF Year**

(from table 15)	2010	2015	2020	2025	2030 - opt
<b>Demand</b>	4,850	4,960	5,020	5,050	5,060
% of year 2005	46.1%	47.2%	47.7%	48.0%	48.1%



<b>Table 42</b>					
<b>Projected Supply and Demand Comparison - AF Year</b>					
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030 - opt</b>
<b>Supply totals</b>	6,340	6,280	6,700	6,340	5,970
<b>Demand totals</b>	4,850	4,960	5,020	5,050	5,060
<b>Difference</b>	1,490	1,320	1,680	1,290	910
Difference as % of Supply	23.5%	21.0%	25.1%	20.3%	15.2%
Difference as % of Demand	30.7%	26.6%	33.5%	25.5%	18.0%

**Supply and Demand Comparison: Single-dry Year Scenario**

**(Water Code § 10635 (a))**

Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments. Sec 4, p.4-23 Reference & Page Number

<b>Table 43</b>					
<b>Projected single dry year Water Supply - AF Year</b>					
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030 - opt</b>
<b>Supply</b>	6,010	6,540	6,740	6,340	6,040
% of projected normal	94.8%	104.1%	100.6%	100.0%	101.2%

<b>Table 44</b>					
<b>Projected single dry year Water Demand - AF Year</b>					
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030 - opt</b>
<b>Demand</b>	5,120	5,230	5,300	5,330	5,340
% of projected normal	105.6%	105.4%	105.6%	105.5%	105.5%

<b>Table 45</b>					
<b>Projected single dry year Supply and Demand Comparison - AF Year</b>					
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030 - opt</b>
<b>Supply totals</b>	6,010	6,540	6,740	6,340	6,040
<b>Demand totals</b>	5,120	5,230	5,300	5,330	5,340
<b>Difference</b>	890	1,310	1,440	1,010	700
Difference as % of Supply	14.8%	20.0%	21.4%	15.9%	11.6%
Difference as % of Demand	17.4%	25.0%	27.2%	18.9%	13.1%

**Supply and Demand Comparison: Multiple-dry Year Scenario****(Water Code § 10635 (a))**

Project a multiple-dry year period (as identified in Table 9) occurring between 2006-2010 and compare projected supply and demand during those years

Sec 4, p.4-24 Reference & Page Number

<b>Table 46</b>					
<b>Projected supply during multiple dry year period ending in 2010 - AF Year</b>					
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Supply</b>	6,390	6,380	6,250	6,240	6,230
% of projected normal	100.0%	100.0%	98.3%	98.3%	98.3%

<b>Table 47</b>					
<b>Projected demand multiple dry year period ending in 2010 - AFY</b>					
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Demand</b>	4,790	4,800	5,140	5,020	5,120
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

<b>Table 48</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2010- AF Year</b>					
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Supply totals</b>	6,390	6,380	6,250	6,240	6,230
<b>Demand totals</b>	4,790	4,800	5,140	5,020	5,120
<b>Difference</b>	1,600	1,580	1,110	1,220	1,110
<b>Difference as % of Supply</b>	25.0%	24.8%	17.8%	19.6%	17.8%
<b>Difference as % of Demand</b>	33.4%	32.9%	21.6%	24.3%	21.7%

Project a multiple-dry year period (as identified in Table 9) occurring between 2011-2015 and compare projected supply and demand during those years

Sec 4, p.4-25 Reference & Page Number

<b>Table 49</b>					
<b>Projected supply during multiple dry year period ending in 2015 - AF Year</b>					
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Supply</b>	6,330	6,320	6,730	6,720	6,710
% of projected normal	100.0%	100.0%	106.8%	106.8%	106.8%

<b>Table 50</b>					
<b>Projected demand multiple dry year period ending in 2015 - AFY</b>					
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Demand</b>	4,870	4,890	5,250	5,120	5,230
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

<b>Table 51</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2015- AF Year</b>					
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Supply totals</b>	6,330	6,320	6,730	6,720	6,710
<b>Demand totals</b>	4,870	4,890	5,250	5,120	5,230
<b>Difference</b>	1,460	1,430	1,480	1,600	1,480
<b>Difference as % of Supply</b>	23.1%	22.6%	22.0%	23.8%	22.1%
<b>Difference as % of Demand</b>	30.0%	29.2%	28.2%	31.3%	28.3%

- Project a multiple-dry year period (as identified in Table 9) occurring between 2016-2020 and compare projected supply and demand during those years Sec. 4, p.4-26 Reference & Page Number

<b>Table 52</b>					
<b>Projected supply during multiple dry year period ending in 2020 - AF Year</b>					
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Supply</b>	6,360	6,450	6,750	6,830	6,920
% of projected normal	100.0%	100.0%	103.4%	103.2%	103.3%

<b>Table 53</b>					
<b>Projected demand multiple dry year period ending in 2020 - AFY</b>					
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Demand</b>	4,970	4,980	5,340	5,200	5,300
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

<b>Table 54</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2020- AF Year</b>					
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Supply totals</b>	6,360	6,450	6,750	6,830	6,920
<b>Demand totals</b>	4,970	4,980	5,340	5,200	5,300
<b>Difference</b>	1,390	1,470	1,410	1,630	1,620
<b>Difference as % of Supply</b>	21.9%	22.8%	20.9%	23.9%	23.4%
<b>Difference as % of Demand</b>	28.0%	29.5%	26.4%	31.3%	30.6%

Project a multiple-dry year period (as identified in Table 9) occurring between 2021-2025 and compare projected supply and demand during those years Sec. 4, p.4-27 Reference & Page Number

<b>Table 55</b>					
<b>Projected supply during multiple dry year period ending in 2025 - AF Year</b>					
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply</b>	6,630	6,560	6,640	6,570	6,490
% of projected normal	100.0%	100.0%	102.5%	102.5%	102.4%

<b>Table 56</b>					
<b>Projected demand multiple dry year period ending in 2025 - AFY</b>					
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Demand</b>	5,030	5,030	5,380	5,230	5,330
% of projected normal	100.0%	100.0%	106.7%	103.7%	105.5%

<b>Table 57</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2025- AF Year</b>					
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply totals</b>	6,630	6,560	6,640	6,570	6,490
<b>Demand totals</b>	5,030	5,030	5,380	5,230	5,330
<b>Difference</b>	1,600	1,530	1,260	1,340	1,160
<b>Difference as % of Supply</b>	24.1%	23.3%	19.0%	20.4%	17.9%
<b>Difference as % of Demand</b>	31.8%	30.4%	23.4%	25.6%	21.8%

**Provision of Water Service Reliability section to cities/counties within service area (Water Code § 10635(b))**

Provided Water Service Reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR Sec 1, p.1-2 Reference & Page Number

**Does the Plan Include Public Participation and Plan Adoption (Water Code § 10642)**

<input checked="" type="checkbox"/>	Attach a copy of adoption resolution	<u>Sec 1, p.1-2</u>	<u>Appendix D</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Encourage involvement of social, cultural & economic community groups	<u>Sec 1, p.1-2</u>	<u>Sec 1, p.1-2</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Plan available for public inspection	<u>Sec 1, p.1-2</u>	<u>Sec 1, p.1-2</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Provide proof of public hearing	<u>Sec 1, p.1-2</u>	<u>Appendix D</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Provided meeting notice to local governments	<u>Sec 1, p.1-2</u>	<u>Sec 1, p.1-2</u>	Reference & Page Number

**Review of implementation of 2000 UWMP (Water Code § 10643)**

<input type="checkbox"/>	Reviewed implementation plan and schedule of 2000 UWMP	<u>                    </u>	<u>                    </u>	Reference & Page Number
<input type="checkbox"/>	Implemented in accordance with the schedule set forth in plan	<u>                    </u>	<u>                    </u>	Reference & Page Number
<input checked="" type="checkbox"/>	2000 UWMP not required	<u>Sec 1, p.1-2</u>	<u>                    </u>	Reference & Page Number

**Provision of 2005 UWMP to local governments (Water Code § 10644 (a))**

Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption Sec 1, p.1-2 Reference & Page Number

**Does the plan or correspondence accompanying it show where it is available for public review (Water Code § 10645)**

Does UWMP or correspondence accompanying it show where it is available for public review Back Cover Reference & Page Number

**2005 Urban Water Management Plan "Review for Completeness" Form**  
**For DWR Review Staff Use**

**Coordination with Appropriate Agencies** (Water Code § 10620 (d)(1)(2))

- Yes  
 Participated in area, regional, watershed or basin wide plan East Orange County  
 Name of plan 2005 UWMP Lead Agency Water District (Retail) Sec 1, p.1-2 Reference & Page Number  
 Describe the coordination of the plan preparation and anticipated benefits. Sec 1, p.1-2 Reference & Page Number

Table 1 Coordination with Appropriate Agencies							
Check at least one box on each row	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not Involved / No Information
EOCWD staff	X	X	X	X	X	X	
MWDOC				X			
OCWD				X		X	
EOCWD sub-agencies		X	X	X			
MWD of So. Calif.		X		X		X	

**Describe resource maximization / import minimization plan** (Water Code §10620 (f))

- Describe how water management tools / options maximize resources & minimize need to import water Sec 2, p.2-5 Reference & Page Number

**Plan Updated in Years Ending in Five and Zero** (Water Code § 10621(a))

- Date updated and adopted plan received DWR to enter (enter date) Sec 1, p.1-2 Reference & Page Number

**City and County Notification and Participation** (Water Code § 10621(b))

- Notify any city or county within service area of UWMP of plan review & revision Sec 1, p.1-2 Reference & Page Number  
 Consult and obtain comments from cities and counties within service area Sec 1, p.1-2 Reference & Page Number

**Service Area Information** Water Code § 10631 (a))

- Include current and projected population Sec 1, p.1-12 Reference & Page Number  
 Population projections were based on data from state, regional or local agency Sec 1, p.1-12 Reference & Page Number

Table 2 Population - Current and Projected						
	2005	2010	2015	2020	2025	2030 - opt
<b>Service Area Population</b>	3,872	3,970	4,060	4,150	4,250	4,350

- 
- 

Describe climate characteristics that affect water management  
 Describe other demographic factors affecting water management

Sec 1, p.1-5 Reference & Page Number  
Sec 1, p.1-5 Reference & Page Number

Table 3 Climate						
	January	February	March	April	May	June
<b>Standard Average ETo</b>	1.86	2.24	3.41	4.8	5.58	6.3
<b>Average Rainfall</b>	2.53	2.73	2.21	1.01	0.26	0.07
<b>Average Temperature</b>	53.8	55.3	56.9	60.3	63.8	67.4

Table 3 (continued) Climate							
	July	August	September	October	November	December	Annual
<b>Average ETo</b>	6.51	6.2	4.8	3.72	2.4	1.86	<b>49.7</b>
<b>Average Rainfall</b>	0.01	0.08	0.27	0.36	1.32	1.99	12.84
<b>Average Temperature</b>	71.6	72.5	70.9	65.8	59.2	54.5	62.6

Water Sources		(Water Code § 10631 (b))
<input checked="" type="checkbox"/>	Identify existing and planned water supply sources	<u>Sec 2, p.2-1</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provide current water supply quantities	<u>Sec 2, p.2-5</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provide planned water supply quantities	Sec 2, <u>pgs.2-5, 4-31</u> Reference & Page Number

Table 4 Current and Planned Water Supplies - AFY						
Water Supply Sources	2005	2010	2015	2020	2025	2030 - opt
<b>Water purchased from:</b>						
<b>Municipal Water District of Orange County - Imported</b>	428	460	440	480	450	440
<b>Orange County Groundwater Basin - Groundwater</b>	642	820	830	840	850	860
<b>Total</b>	<b>1,070</b>	<b>1,280</b>	<b>1,270</b>	<b>1,320</b>	<b>1,300</b>	<b>1,300</b>

**If Groundwater identified as existing or planned source**

**(Water Code §10631 (b)(1-4))**

<input type="checkbox"/>	Has management plan	_____	Reference & Page Number
<input type="checkbox"/>	Attached management plan (b)(1)	_____	Reference & Page Number
<input checked="" type="checkbox"/>	Description of basin(s) (b)(2)	Sec 2, p.2-7	Reference & Page Number
<input type="checkbox"/>	Basin is adjudicated	_____	Reference & Page Number
<input type="checkbox"/>	If adjudicated, attached order or decree (b)(2)	_____	Reference & Page Number
<input type="checkbox"/>	Quantified amount of legal pumping right (b)(2)	_____	Reference & Page Number

Table 5 Groundwater Pumping Rights - AF Year	
Basin Name	Pumping Right - AFY
Orange County Groundwater Basin (Coastal Plain of Orange County)	Managed Basin
<b>Total</b>	<b>0</b>

<input type="checkbox"/>	DWR identified, or projected to be, in overdraft (b)(2)	_____	Reference & Page Number
<input type="checkbox"/>	Plan to eliminate overdraft (b)(2)	_____	Reference & Page Number
<input checked="" type="checkbox"/>	Analysis of location, amount & sufficiency, last five years (b)(3)	Sec 2, p.2-5	Reference & Page Number
<input type="checkbox"/>	Analysis of location & amount projected, 20 years (b)(4)	_____	Reference & Page Number

Table 6 Amount of Groundwater pumped - AFY					
Basin Name (s)	2001	2002	2003	2004	2005
EOCWD East Well	743.5	579.8	147.7	281.6	329.5
EOCWD West Well	51.7	128	64	35	312
<b>% of Total Water Supply</b>	<b>72.6%</b>	<b>60.2%</b>	<b>18.9%</b>	<b>26.6%</b>	<b>60.0%</b>

Table 7 Amount of Groundwater projected to be pumped - AFY					
Basin Name(s)	2010	2015	2020	2025	2030 - opt
EOCWD East Well	500	510	520	530	540
EOCWD West Well	310	310	310	310	310
<b>% of Total Water Supply</b>	<b>64%</b>	<b>65%</b>	<b>64%</b>	<b>65%</b>	<b>66%</b>



**Reliability of Supply**

**(Water Code §10631 (c) (1-3))**

Describes the reliability of the water supply and vulnerability to seasonal or climatic shortage

Sec 4,4-1,38 Reference & Page Number

Table 8 Supply Reliability - AF Year					
Average / Normal Water Year	Single Dry Water Year (2010)	Multiple Dry Water Years			
		Year 1 (2007)	Year 2 (2008)	Year 3 (2009)	Year 4 (2010)
	6,010	6,380	6,250	6,240	6,230
Normal year AF	6,340	6,380	6,360	6,350	6,340
% of Normal	94.8%	100.0%	98.3%	98.3%	98.3%

Table 9 Basis of Water Year Data			
Water Year Type	Source name	Source name	Source name
Average Water Year	1922-2004	MWDOC	EOCWD
Single-Dry Water Year	1961	MWDOC	
Multiple-Dry Water Years	1959-1961	MWDOC	

Sec 4, p.4-20 Reference & Page Number

Sec 4, p.4-20 Reference & Page Number

Sec 4, p.4-20 Reference & Page Number

**Water Sources Not Available on a Consistent Basis**

**(Water Code §10631 (c))**

Describe the reliability of the water supply due to seasonal or climatic shortages

Sec 4, p.4-38 Reference & Page Number

Describe the vulnerability of the water supply to seasonal or climatic shortages

Sec 4, p.4-38 Reference & Page Number

No unreliable sources

Sec 4, p.4-38 Reference & Page Number

Table 10 Factors resulting in inconsistency of supply				
Name of supply	Legal	Environmental	Water Quality	Climatic

- Describe plans to supplement or replace inconsistent sources with alternative sources or DMMs
- No inconsistent sources

Reference & Page Number

Sec 4, p.4-1 Reference & Page Number

**Transfer or Exchange Opportunities**

**(Water Code §10631 (d))**

- Describe short term and long term exchange or transfer opportunities
- No transfer opportunities

Sec 4, p.4-46 Reference & Page Number

                     Reference & Page Number

Table11 Transfer and Exchange Opportunities - AF Year					
Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities
<b>Total</b>			0		0

**Water Use Provisions**

**(Water Code §10631 (e)(1)(2))**

- Quantify past water use by sector
- Quantify current water use by sector
- Project future water use by sector

Sec 5, p.5-2 Reference & Page Number

Sec 5, p.5-2 Reference & Page Number

Sec 5, p.5-2 Reference & Page Number

TABLE 12 - Past, Current and Projected Water Deliveries						
Water Use Sectors	2000		2005		2010	
	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	1,150	1,149	1,174	975	1,180	1,117
Commercial	1	5	1	9	1	10
Institutional/Municipal	2	17	2	21	2	22
Landscape/Irrigation	14	21	14	20	14	20
Agriculture	1	0	1	1	1	1
<b>Total</b>	<b>1,168</b>	<b>1,192</b>	<b>1,192</b>	<b>1,026</b>	<b>1,198</b>	<b>1,170</b>

TABLE 12 (continued) - Past, Current and Projected Water Deliveries								
	2015		2020		2025		2030 - opt	
	metered		metered		metered		metered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	1,186	1,127	1,192	1,147	1,198	1,157	1,204	1,177
Commercial	1	10	1	10	1	10	1	10
Institutional/Municipal	2	22	2	22	2	22	2	22
Landscape/Irrigation	14	20	14	20	14	20	14	20
Agriculture	1	1	1	1	1	1	1	1
<b>Total</b>	<b>1,204</b>	<b>1,180</b>	<b>1,210</b>	<b>1,200</b>	<b>1,216</b>	<b>1,210</b>	<b>1,222</b>	<b>1,230</b>

- Identify and quantify sales to other agencies
- No sales to other agencies

Reference & Page Number  
Sec 5, p.5-2 Reference & Page Number

Table 13 Sales to Other Agencies - AF Year							
Water Distributed	2000	2005	2010	2015	2020	2025	2030 - opt
name of agency	0	0	0	0	0	0	0
name of agency							
name of agency							
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

- Identify and quantify additional water uses

Reference & Page Number

Table 14 Additional Water Uses and Losses - AF Year							
Water Use	2000	2005	2010	2015	2020	2025	2030 - opt
Unaccounted-for system losses							
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Any recycled water was included in table 12 should not be included in table 14.

Table 15 Total Water Use - AF Year							
Water Use	2000	2005	2010	2015	2020	2025	2030 - opt
<b>Total of Tables 12, 13, 14</b>	<b>1,192</b>	<b>1,026</b>	<b>1,170</b>	<b>1,180</b>	<b>1,200</b>	<b>1,210</b>	<b>1,230</b>

**2005 Urban Water Management Plan "Review of DMMs for Completeness" Form (Water Code §10631 (f))**

(Water Code §10631 (f) & (g), the 2005 Urban Water Management Plan "Review of DMMs for Completeness" Form is found on Sheet 2

**Planned Water Supply Projects and Programs, including non-implemented DMMs**

**(Water Code §10631 (g))**

<input checked="" type="checkbox"/>	No non-implemented / not scheduled DMMs	<u>Sec 6, p.6-1</u>	Reference & Page Number
<input type="checkbox"/>	Cost-Benefit includes economic and non-economic factors (environmental, social, health, customer impact, and technological factors)	<u>                    </u>	Reference & Page Number
<input type="checkbox"/>	Cost-Benefit analysis includes total benefits and total costs	<u>                    </u>	Reference & Page Number
<input type="checkbox"/>	Identifies funding available for Projects with higher per-unit-cost than DMMs	<u>                    </u>	Reference & Page Number
<input checked="" type="checkbox"/>	Identifies Suppliers' legal authority to implement DMMs, efforts to implement the measures and efforts to identify cost share partners	<u>Sec 6, p.6-1</u>	Reference & Page Number

Table 16 Evaluation of unit cost of water resulting from non-implemented / non-scheduled DMMs and planned water supply project and programs	
Non-implemented & Not Scheduled DMM / Planned Water Supply Projects (Name)	Per-AF Cost (\$)

**Planned Water Supply Projects and Programs**

**(Water Code §10631 (h))**

<input type="checkbox"/>	No future water supply projects or programs		
<input checked="" type="checkbox"/>	Detailed description of expected future supply projects & programs	<u>Sec. 4,p.38+</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Timeline for each proposed project	<u>Sec. 4,p.38+</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Quantification of each projects normal yield (AFY)	<u>Sec. 4,p.38+</u>	Reference & Page Number
<input type="checkbox"/>	Quantification of each projects single dry-year yield (AFY)	<u>                    </u>	Reference & Page Number
<input type="checkbox"/>	Quantification of each projects multiple dry-year yield (AFY)	<u>                    </u>	Reference & Page Number

Table 17 Future Water Supply Projects							
Project Name	Projected Start Date	Projected Completion Date	Normal-year AF to agency	Single-dry year yield AF	Multiple-Dry-Year 1 AF	Multiple-Dry-Year 2 AF	Multiple-Dry-Year 3 AF

**Opportunities for development of desalinated water (Water Code §10631 (i))**

- Describes opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply Sec. 4, p.4-46 Reference & Page Number
- No opportunities for development of desalinated water \_\_\_\_\_ Reference & Page Number

Table 18 Opportunities for desalinated water	
Sources of Water	Check if yes
Ocean Water (by Metropolitan)	X
Brackish ocean water	
Brackish groundwater	

**District is a CUWCC signatory (Water Code § 10631 (j))**

Urban suppliers that are California Urban Water Conservation Council members may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g). The supplier's CUWCC Best Management Practices Report should be attached to the UWMP.

- Agency is a CUWCC member Sec 6, p.6-1 Reference & Page Number
- 2003-04 annual updates are attached to plan \_\_\_\_\_ Reference & Page Number
- Both annual updates are considered completed by CUWCC website \_\_\_\_\_ Reference & Page Number

**If Supplier receives or projects receiving water from a wholesale supplier (Water Code §10631 (k))**

- Yes
- Agency receives, or projects receiving, wholesale water Sec 4. p.4-31 Reference & Page Number
- Agency provided written demand projections to wholesaler, 20 years Sec 4. p.4-31 Reference & Page Number

Table 19 Agency demand projections provided to wholesale suppliers - AFY					
Wholesaler	2010	2015	2020	2025	2030 - opt
East Orange County Water District from Municipal Water District of Orange County (MWDOC)	350	350	360	360	370
(name 2)					
(name 3)					

- Wholesaler provided written water availability projections, by source, to agency, 20 years Sec 4, p.4-31 Reference & Page Number (if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 20 Wholesaler identified & quantified the existing and planned sources of water- AFY					
Wholesaler sources	2010	2015	2020	2025	2030 - opt
East Orange County Water District from MWDOC	460	440	480	450	440
(source 2)					
(source 3)					

- Reliability of wholesale supply provided in writing by wholesale agency Sec 4, p.4-17 Reference & Page Number (if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 21 Wholesale Supply Reliability - % of normal AFY					
Wholesaler sources	Multiple Dry Water Years				
	Single Dry	Year 1	Year 2	Year 3	Year 4
East Orange County Water District from MWDOC	105.5%	106.7%	103.7%	105.5%	
(source 2)					
(source 3)					

Table 22 Factors resulting in inconsistency of wholesaler's supply				
Name of supply	Legal	Environment	Water Quality	Climatic

**Water Shortage Contingency Plan Section**

**(Water Code § 10632)**

**Stages of Action**

**(Water Code § 10632 (a))**

- Provide stages of action Sec 7, p.7-1 Reference & Page Number
- Provide the water supply conditions for each stage Sec 7, p.7-1 Reference & Page Number
- Includes plan for 50 percent supply shortage Sec 7, p.7-5 Reference & Page Number

Table 23 Water Supply Shortage Stages and Conditions RATIONING STAGES		
Stage No.	Water Supply Conditions	% Shortage
Phase 1	Basic conservation measures	
Phase 2	Prohibits violation of Phase 1 and 85% excess water use	
Phase 3	Prohibits violation of Phase 1,2 and 80% excess water use	

**Three-Year Minimum Water Supply**

**(Water Code §10632 (b))**

- Identifies driest 3-year period Sec 4, p.4-16 Reference & Page Number
- Minimum water supply available by source for the next three years Sec 7, p.7-4 Reference & Page Number

Table 24 Three-Year Estimated Minimum Water Supply - AF Year				
source**	Normal Base Year	Multiple Dry Year		
	2006	2006	2007	2008
Local Supplies	740	960	960	960
Imported Supply	550	540	540	540
<b>Total</b>	1,290	1,500	1,500	1,500

\*Note: If reporting after 2005, please change the column headers (Year 1, 2, & 3) to the appropriate years

**Preparation for catastrophic water supply interruption**

**(Water Code §10632 (c))**

- Provided catastrophic supply interruption plan Sec 7, p.7-4 Reference & Page Number

Table 25 Preparation Actions for a Catastrophe	
Possible Catastrophe	Check if Discussed
Regional power outage	X
Earthquake	X

**Prohibitions**

**(Water Code § 10632 (d))**

List the mandatory prohibitions against specific water use practices during water shortages Sec 7, p.7-5 Reference & Page Number

Table 26 Mandatory Prohibitions	
Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Washing of sidewalks, driveways, parking area	Phase 1,2,3
Lawn watering & landscape irrigation	Phase 1,2,3
Refilling fountains, ponds, lakes	Phase 1,2,3
Restaurant water service unless requested	Phase 1,3
Water use in excess amount of 85%	Phase 2
Use of water from fire hydrants	Phase 3
Washing of autos, trucks, trailers	Phase 3
Agricultural users and commercial nurseries	Phase 3
Water use in excess amount of 80%	Phase 3

**Consumption Reduction Methods**

**(Water Code § 10632 (e))**

List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction. Sec 7, p.7-5 Reference & Page Number

Table 27 Consumption Reduction Methods		
Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Prohibits washing all paved surfaces; watering turf areas during specified times only; prohibits water use for fountains, ponds, lakes; and no serving drinking water to customers unless requested.	Phase I	Voluntary actions, expected reductions
Phase I methods, as well as irrigation of commercial nurseries, golf courses, and an additional reduction of 15%.	Phase II	15%
Phase II methods, and additional reduction to at least 20% or more.	Phase III	20-50%



**Penalties**

**(Water Code § 10632 (f))**

List excessive use penalties or charges for excessive use

Sec 7, p.7-5 Reference & Page Number

Table 28 Penalties and Charges	
Penalties or Charges	Stage When Penalty Takes Effect
Written notice issued to customer	First Violation
Surcharge of 15% of customers bill	Second Violation
Surcharge of 30% of customers bill, installation of flow restricting device	Third Violation

**Revenue and Expenditure Impacts**

**(Water Code § 10632 (g))**

Describe how actions and conditions impact revenues

Sec 7, p.7-6 Reference & Page Number

Describe how actions and conditions impact expenditures

Sec 7, p.7-6 Reference & Page Number

Describe measures to overcome the revenue and expenditure impacts

Sec 7, p.7-6 Reference & Page Number

Table 29 Proposed measures to overcome revenue impacts	
Names of measures	Check if Discussed
Rate adjustment	X
Development of reserves	

Table 30 Proposed measures to overcome expenditure impacts	
Names of measures	Check if Discussed
Monitor projected expenditures	X
Rate surcharges	X

**Water Shortage Contingency Ordinance/Resolution**

**(Water Code § 10632 (h))**

Attach a copy of the draft water shortage contingency resolution or ordinance.

Sec 7, p.7-8 Reference & Page Number

**Reduction Measuring Mechanism**

**(Water Code § 10632 (i))**

Provided mechanisms for determining actual reductions

Sec 7, p.7-9 Reference & Page Number

Table 31 Water Use Monitoring Mechanisms	
Mechanisms for determining actual reductions	Type data expected (pop-up?)
Daily/Weekly/Monthly Reports	Estimated water savings
Drought Program Officer activities	Monitored effectiveness

**Recycling Plan Agency Coordination**

**Water Code § 10633**

Describe the coordination of the recycling plan preparation information to the extent available.

Sec 8, p.8-1 Reference & Page Number

Table 32 Participating agencies	
	participated
Water agencies	
Wastewater agencies	OCSD
Groundwater agencies	OWSD
Planning Agencies	

**Wastewater System Description**

**(Water Code § 10633 (a))**

Describe the wastewater collection and treatment systems in the supplier's service area

Sec 8, p.8-4 Reference & Page Number

Quantify the volume of wastewater collected and treated

Sec 8, p.8-4 Reference & Page Number

Table 33 Wastewater Collection and Treatment - AF Year							
Type of Wastewater	2000	2005	2010	2015	2020	2025	2030 - opt
Wastewater collected & treated in service area	N/A	10,686	11,758	12,521	13,152	13,281	13,320
Unit Flow Coefficient (gpcd)		106	109	112	115	115	115



Compare UWMP 2000 projections with UWMP 2005 actual (§ 10633 (e))

Reference & Page Number

None (**2000 plan not required**)

Sec 8, p.8-7

Reference & Page Number

Table 37 Recycled Water Uses - 2000 Projection compared with 2005 actual - AFY		
User type	2000 Projection for 2005	2005 actual use
Agriculture		
Landscape		
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Other (user type)		
Other (user type)		
<b>Total</b>	0	0

**Plan to Optimize Use of Recycled Water**

**(Water Code § 10633 (f))**

Describe actions that might be taken to encourage recycled water uses  
 Describe projected results of these actions in terms of acre-feet of recycled water used per year

Sec 8, p.8-7

Reference & Page Number

                     Reference & Page Number

Table 38 Methods to Encourage Recycled Water Use					
Actions	AF of use projected to result from this action				
	2010	2015	2020	2025	2030 - opt
Financial incentives					
Public Education					
<b>Total</b>	0	0	0	0	0

Provide a recycled water use optimization plan which includes actions to facilitate the use of recycled water (dual distribution systems, promote recirculating uses)

Sec 8, p.8-8

Reference & Page Number

**Water quality impacts on availability of supply**

**(Water Code §10634)**

- Discusses water quality impacts (by source) upon water management strategies and supply reliability
- No water quality impacts projected

Sec 3, p.3-9 Reference & Page Number

Table 39 Current & projected water supply changes due to water quality - percentage						
water source	2005	2010	2015	2020	2025	2030 - opt

**Supply and Demand Comparison to 20 Years**

**(Water Code § 10635 (a))**

- Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.

Sec 4, p.4-31 Reference & Page Number

Table 40 Projected Normal Water Supply - AF Year					
(from table 4)	2010	2015	2020	2025	2030 - opt
<b>Supply</b>	1,280	1,270	1,320	1,300	1,300
% of year 2005	100.0%	100.0%	100.0%	100.0%	100.0%

Table 41 Projected Normal Water Demand - AF Year					
(from table 15)	2010	2015	2020	2025	2030 - opt
<b>Demand</b>	1,170	1,180	1,200	1,210	1,230
% of year 2005	102.6%	103.5%	105.3%	106.1%	107.9%

Table 42 Projected Supply and Demand Comparison - AF Year					
	2010	2015	2020	2025	2030 - opt
<b>Supply totals</b>	1,280	1,270	1,320	1,300	1,300
<b>Demand totals</b>	1,170	1,180	1,200	1,210	1,230
<b>Difference</b>	110	90	120	90	70
Difference as % of Supply	8.6%	7.1%	9.1%	6.9%	5.4%
Difference as % of Demand	9.4%	7.6%	10.0%	7.4%	5.7%

**Supply and Demand Comparison: Single-dry Year Scenario****(Water Code § 10635 (a))**

Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments.

Sec 4, p.4-32 Reference & Page Number

Table 43 Projected single dry year Water Supply - AF Year					
	2010	2015	2020	2025	2030 - opt
<b>Supply</b>	1,290	1,330	1,370	1,350	1,350
% of projected normal	100.8%	104.7%	103.8%	103.8%	103.8%

Table 44 Projected single dry year Water Demand - AF Year					
	2010	2015	2020	2025	2030 - opt
<b>Demand</b>	1,230	1,240	1,270	1,280	1,300
% of projected normal	107.9%	108.8%	111.4%	112.3%	114.0%

Table 45 Projected single dry year Supply and Demand Comparison - AF Year					
	2010	2015	2020	2025	2030 - opt
<b>Supply totals</b>	1,290	1,330	1,370	1,350	1,350
<b>Demand totals</b>	1,230	1,240	1,270	1,280	1,300
<b>Difference</b>	60	90	100	70	50
Difference as % of Supply	4.7%	6.8%	7.3%	5.2%	3.7%
Difference as % of Demand	4.9%	7.3%	7.9%	5.5%	3.8%

**Supply and Demand Comparison: Multiple-dry Year Scenario****(Water Code § 10635 (a))**

Project a multiple-dry year period (as identified in Table 9) occurring between 2006-2010 and compare projected supply and demand during those years

Sec 4, p.4-33 Reference & Page Number

Table 46 Projected supply during multiple dry year period ending in 2010 - AF Year					
	2006	2007	2008	2009	2010
<b>Supply</b>	1,290	1,290	1,360	1,310	1,310
% of projected normal	100.0%	100.0%	106.3%	102.3%	102.3%

<b>Table 47</b>					
<b>Projected demand multiple dry year period ending in 2010 - AFY</b>					
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Demand</b>	1,150	1,150	1,240	1,200	1,230
% of projected normal	100.9%	100.9%	108.8%	103.7%	105.5%

<b>Table 48</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2010- AF Year</b>					
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Supply totals</b>	1,290	1,290	1,360	1,310	1,310
<b>Demand totals</b>	1,150	1,150	1,240	1,200	1,230
<b>Difference</b>	140	140	120	110	80
<b>Difference as % of Supply</b>	10.9%	10.9%	8.8%	8.4%	6.1%
<b>Difference as % of Demand</b>	12.2%	12.2%	9.7%	9.2%	6.5%



Project a multiple-dry year period (as identified in Table 9) occurring between 2011-2015 Sec 4, p.4-34 Reference & Page Number and compare projected supply and demand during those years

<b>Table 49</b>					
<b>Projected supply during multiple dry year period ending in 2015 - AF Year</b>					
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Supply</b>	1,280	1,270	1,360	1,320	1,340
% of projected normal	100.0%	99.2%	107.1%	103.9%	105.5%

<b>Table 50</b>					
<b>Projected demand multiple dry year period ending in 2015 - AFY</b>					
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Demand</b>	1,170	1,170	1,260	1,220	1,240
% of projected normal	102.6%	102.6%	110.5%	107.0%	108.8%

<b>Table 51</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2015- AF Year</b>					
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Supply totals</b>	1,280	1,270	1,360	1,320	1,340
<b>Demand totals</b>	1,170	1,170	1,260	1,220	1,240
<b>Difference</b>	110	100	100	100	100
<b>Difference as % of Supply</b>	8.6%	7.9%	7.4%	7.6%	7.5%
<b>Difference as % of Demand</b>	9.4%	8.5%	7.9%	8.2%	8.1%

Project a multiple-dry year period (as identified in Table 9) occurring between 2016-2020 Sec 4, p.4-35 Reference & Page Number and compare projected supply and demand during those years

<b>Table 52</b>					
<b>Projected supply during multiple dry year period ending in 2020 - AF Year</b>					
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Supply</b>	1,280	1,290	1,370	1,360	1,390
% of projected normal	100.0%	100.0%	105.4%	103.8%	105.3%

<b>Table 53</b>					
<b>Projected demand multiple dry year period ending in 2020 - AFY</b>					
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Demand</b>	1,180	1,190	1,270	1,240	1,270
% of projected normal	103.5%	104.4%	111.4%	108.8%	111.4%

<b>Table 54</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2020- AF Year</b>					
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Supply totals</b>	1,280	1,290	1,370	1,360	1,390
<b>Demand totals</b>	1,180	1,190	1,270	1,240	1,270
<b>Difference</b>	100	100	100	120	120
<b>Difference as % of Supply</b>	7.8%	7.8%	7.3%	8.8%	8.6%
<b>Difference as % of Demand</b>	8.5%	8.4%	7.9%	9.7%	9.4%





Project a multiple-dry year period (as identified in Table 9) occurring between 2021-2025 and compare projected supply and demand during those years Sec 4, p.4-36 Reference & Page Number

<b>Table 55</b>					
<b>Projected supply during multiple dry year period ending in 2025 - AF Year</b>					
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply</b>	1,310	1,310	1,370	1,350	1,360
% of projected normal	99.2%	100.0%	104.6%	103.8%	104.6%

<b>Table 56</b>					
<b>Projected demand multiple dry year period ending in 2025 - AFY</b>					
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Demand</b>	1,200	1,200	1,290	1,250	1,280
% of projected normal	105.3%	105.3%	113.2%	109.6%	112.3%

<b>Table 57</b>					
<b>Projected Supply and Demand Comparison during multiple dry year period ending in 2025- AF Year</b>					
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply totals</b>	1,310	1,310	1,370	1,350	1,360
<b>Demand totals</b>	1,200	1,200	1,290	1,250	1,280
<b>Difference</b>	110	110	80	100	80
<b>Difference as % of Supply</b>	8.4%	8.4%	5.8%	7.4%	5.9%
<b>Difference as % of Demand</b>	9.2%	9.2%	6.2%	8.0%	6.3%

<b>Provision of Water Service Reliability section to cities/counties within service area</b>		<b>(Water Code § 10635(b))</b>	
<input checked="" type="checkbox"/>	Provided Water Service Reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR	<u>Sec 1, p.1-2</u>	Reference & Page Number

<b>Does the Plan Include Public Participation and Plan Adoption</b>		<b>(Water Code § 10642)</b>	
<input checked="" type="checkbox"/>	Attach a copy of adoption resolution	<u>Sec 1, p.1-2</u>	<u>Appendix D</u> Reference & Page Number
<input checked="" type="checkbox"/>	Encourage involvement of social, cultural & economic community groups	<u>Sec 1, p.1-2</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Plan available for public inspection	<u>Sec 1, p.1-2</u>	<u>Appendix D</u> Reference & Page Number
<input checked="" type="checkbox"/>	Provide proof of public hearing	<u>Sec 1, p.1-2</u>	Reference & Page Number
<input checked="" type="checkbox"/>	Provided meeting notice to local governments	<u>Sec 1, p.1-2</u>	Reference & Page Number

<b>Review of implementation of 2000 UWMP</b>		<b>(Water Code § 10643)</b>	
<input type="checkbox"/>	Reviewed implementation plan and schedule of 2000 UWMP		Reference & Page Number
<input type="checkbox"/>	Implemented in accordance with the schedule set forth in plan		Reference & Page Number
<input checked="" type="checkbox"/>	2000 UWMP not required	<u>Sec 1, p.1-2</u>	Reference & Page Number

<b>Provision of 2005 UWMP to local governments</b>		<b>(Water Code § 10644 (a))</b>	
<input checked="" type="checkbox"/>	Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption	<u>Sec 1, p.1-2</u>	Reference & Page Number

<b>Does the plan or correspondence accompanying it show where it is available for public review</b>		<b>(Water Code § 10645)</b>	
<input checked="" type="checkbox"/>	Does UWMP or correspondence accompanying it show where it is available for public review	<u>Back Cover</u>	Reference & Page Number

## APPENDIX C

### ***2005 URBAN WATER MANAGEMENT PLAN “REVIEW FOR DMM COMPLETENESS” FORM***

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**2005 Urban Water Management Plan "Review of DMMs for Completeness" Form**  
**For DWR Review Staff Use**

East Orange County Water District (Wholesale) **65**

**Water Survey Programs for Single-Family and Multi-Family Residential Customers (10631 f(1)(a))**

**Implementation**

**(Section 10631 (f))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-2 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p.6-2 Reference & Page Number

Table A1					
Actual	2001	2002	2003	2004	2005
# of single family surveys					
# of multifamily surveys					
actual expenditures - \$					
actual water savings - AFY					

Table A2					
Planned	2006	2007	2008	2009	2010
# of single family surveys					
# of multifamily surveys					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-2 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))
  
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table A3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water (\$ per AF)	
Water Savings (AFY)	

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Residential Plumbing Retrofit (10631 (f)(1)(b))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-2 Reference & Page Number

Year program started 1991 or Year program scheduled to start \_\_\_\_\_

- Describes steps necessary to implement measure Sec 6, p.6-2 Reference & Page Number

# of pre-1992 SF accounts \_\_\_\_\_ # of pre-1992 MF accounts \_\_\_\_\_

Table B1					
Actual	1992-2001	2002	2003	2004	2005
# of single family devices					
# of multi-family devices					
actual expenditures - \$					
actual water savings - AFY					

Table B2					
Planned	2006	2007	2008	2009	2010
# of single family devices					
# of multi-family devices					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) \_\_\_\_\_ Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table B3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**System Water Audits, Leak Detection and Repair (10631 (f)(1)(c))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-3 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-3 Reference & Page Number

Year of last complete audit \_\_\_\_\_ Year of next complete audit \_\_\_\_\_

Table C1					
Actual	2001	2002	2003	2004	2005
% of unaccounted water					
miles of mains surveyed					
miles of lines repaired					
actual expenditures - \$					
actual water savings - AFY					

Table C2					
Planned	2006	2007	2008	2009	2010
% of unaccounted water					
miles of mains surveyed					
miles of lines repaired					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-3 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p. 6-3 Reference & Page Number



**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table C3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Metering with Commodity Rates (10631 (f)(1)(d))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-3 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

- Describes steps necessary to implement measure Sec 6, p. 6-3 Reference & Page Number

Total number of accounts \_\_\_\_\_ # of accounts w/o commodity rates \_\_\_\_\_

Table D1					
Actual	2001	2002	2003	2004	2005
# of unmetered accounts					
# of retrofit meters installed					
# of accounts w/o commodity rates					
actual expenditures - \$					
actual water savings - AFY					

Table D2					
Planned	2006	2007	2008	2009	2010
# of unmetered accounts					
# of retrofit meters installed					
# of accounts w/o commodity rates					
projected expenditures - \$					
projected water savings - AFY					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-3 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p. 6-3 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table D3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name

**Large Landscape Conservation Programs and Incentives (10631 (f)(1)(e))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-4 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-4 Reference & Page Number

# of landscape accounts \_\_\_\_\_ # of landscape accounts with budgets \_\_\_\_\_  
 # of CII accounts \_\_\_\_\_ # of CII accounts w/ landscape surveys \_\_\_\_\_  
 (CII mixed use meters)

Actual	2001	2002	2003	2004	2005
# of budgets developed					
# of surveys completed					
# of follow-up visits					
actual expenditures - \$					
actual water savings - AFY					

Planned	2006	2007	2008	2009	2010
# of budgets developed					
# of surveys completed					
# of follow-up visits					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-4 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table E3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**High-Efficiency Washing Machine Rebate Programs (10631 (f)(1)(f))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for Sec 6, p.6-5 Reference & Page Number implementation (10631 (f) (1)(2))  
 Year program started 2001/2002 or Year program scheduled to start \_\_\_\_\_  
 Other agencies offer rebates \_\_\_\_\_ Cost-effectiveness calcs attached \_\_\_\_\_
- Describes steps necessary to implement measure Sec 6, p.6-5 Reference & Page Number

Table F1					
Actual	2001	2002	2003	2004	2005
\$ per rebate					
# of HECW rebates					
actual water savings - AFY					

Table F2					
Planned	2006	2007	2008	2009	2010
\$ per rebate					
# of HECW rebates					
projected water savings - AFY					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-5 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-5 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table F3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**Public Information Programs (10631 (f)(1)(g))**

**Implementation**

**(Section 10631 (f))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-6 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p.6-6 Reference & Page Number

Table G1					
Actual	2001	2002	2003	2004	2005
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures	X	X	X	X	X
d. Bill showing water usage in comparison to previous year's usage	X	X	X	X	X
e. Demonstration Gardens	X	X	X	X	X
f. Special Events, Media Events	X	X	X	X	X
g. Speaker's Bureau	X	X	X	X	X
h. Program to coordinate with other government agencies, industry and public interest groups and media	X	X	X	X	X
actual expenditures - \$					

Table G2					
Planned	2006	2007	2008	2009	2010
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures	X	X	X	X	X
d. Bill showing water usage in comparison to previous year's usage	X	X	X	X	X
e. Demonstration Gardens	X	X	X	X	X
f. Special Events, Media Events	X	X	X	X	X
g. Speaker's Bureau	X	X	X	X	X
h. Program to coordinate with other government agencies, industry and public interest groups and media	X	X	X	X	X
Projected expenditures - \$					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-6 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table G3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**School Education Programs (10631 (f)(1)(h))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-7 Reference & Page Number

Year program started 1979/1980 or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-7 Reference & Page Number

Table H1		No. of class presentations				
Actual	# of classes	2000/2001	2001/2002	2003	2004	2005
Grades K-High School						
actual expenditures - \$						

Table H2		No. of class presentations				
Actual	# of classes	2006	2007	2008	2009	2010
Grades K-High School						
projected expenditures - \$						

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-7 Reference & Page Number
- Did your agency's material meet state education framework requirements? \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table H3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**Conservation Programs for Commercial, Industrial and Institutional (10631 (f)(1)(i))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-8 Reference & Page Number
- Year program started 1995/1996 or Year program scheduled to start \_\_\_\_\_



Describes steps necessary to implement measure

Sec 6, p. 6-8 Reference & Page Number

# of Commercial accounts \_\_\_\_\_ # of Industrial accounts \_\_\_\_\_ # of Institutional accounts \_\_\_\_\_

Table I1					
Actual	2001	2002	2003	2004	2005
# of surveys completed					
Were incentives provided?					
# of follow-up visits					
actual expenditures - \$					
actual water savings - AFY					

Table I2					
Planned	2006	2007	2008	2009	2010
# of surveys completed					
Were incentives provided?					
# of follow-up visits					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3))

Sec 6, p. 6-8 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4))

\_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

Evaluate legal authority (10631 (g)(4))

Evaluate economic and non-economic factors (10631 (g)(1))

Evaluate environmental, social, health factors (10631 (g)(1))

Evaluate customer impact & technological factors (10631 (g)(1))

Table I3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))

Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County, Orange County Water District

**Conservation Programs for Commercial, Industrial & Institutional - Toilet Replacement (10631 (f)(1)(i))**

(this data is part of the Council Annual Report but is not specifically requested in the UWMP Act)

change

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) \_\_\_\_\_ Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure \_\_\_\_\_ Reference & Page Number

Table I4					
Actual	2001	2002	2003	2004	2005
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
actual expenditures - \$					
actual water savings - AFY					

Table I5					
Planned	2006	2007	2008	2009	2010
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) \_\_\_\_\_ Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table I6 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Wholesale Agency Programs (10631 (f)(1)(j))**

- Not a wholesale agency

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2))
 

	or	
Year program started		Year program scheduled to start
# of suppliers you serve		

Sec 6, p. 6-9 Reference & Page Number

- Describes steps necessary to implement measure

Sec 6, p. 6-9 Reference & Page Number

Table J1	Number of agencies assisted				
program activities	2001	2002	2003	2004	2005
Water Surveys	<b>All programs are implemented for EOCWD member agencies through the Municipal Water District of Orange County as the regional wholesale agency</b>				
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC					
CII ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
UFLT Replacement					
actual expenditures - \$					

Table J2	Number of agencies to be assisted				
program activities	2006	2007	2008	2009	2010
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC					
CII ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
UFLT Replacement					
projected expenditures - \$					



Table K1			
RETAILERS			
<b>Residential</b>			
Water Rate Structure		Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
<b>Commercial</b>			
Water Rate Structure		Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
<b>Industrial</b>			
Water Rate Structure		Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
<b>Institutional/Government</b>			
Water Rate Structure		Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
<b>Irrigation</b>			
Water Rate Structure			
Year rate effective			
<b>Other</b>			
Water Rate Structure		Sewer Rate Structure	pop-up list
Year rate effective		Year rate effective	
Table K2			
WHOLESALE			
Water Rate Structure	Uniform		
Year rate effective			

**Provided an evaluation for this DMM if it is not implemented**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

**(Section 10631 (g))**

Table K3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Water Conservation Coordinator (10631 (f)(1)(l))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-10 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-10 Reference & Page Number

Table L1					
Actual	2001	2002	2003	2004	2005
# of full-time positions <i>(Shared with Retail agency)</i>	1	1	1	1	1
# of full/part-time staff					
actual expenditures - \$					

Table L2					
Planned	2006	2007	2008	2009	2010
# of full-time positions <i>(Shared with Retail agency)</i>	1	1	1	1	1
# of full/part-time staff					
projected expenditures - \$					

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))
  
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table L3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**Waste Water Prohibition (10631 (f)(1)(m))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) **(for retail agency)** Sec 6, p. 6-10 Reference & Page Number  
 Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_
- Describes steps necessary to implement measure \_\_\_\_\_ Reference & Page Number

Table M1					
Actual	2001	2002	2003	2004	2005
waste ordinance in effect					
# of on-site visits					
water softener ordinance					
actual expenditures - \$					



Table M2					
Planned	2006	2007	2008	2009	2010
waste ordinance in effect					
# of on-site visits					
water softener ordinance					
projected expenditures - \$					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f) (3)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table M3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name

**Residential Ultra-Low-Flush Toilet Replacement Programs (10631 (f)(1)(n))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) *(included in retail agency)* Sec 6, p. 6-10 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_  
 # of SF pre-1992 accounts \_\_\_\_\_

X

Describes steps necessary to implement measure

Sec 6, p. 6-10 Reference & Page Number

Table N1	Single-Family				
Actual	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - \$					
actual water savings - AFY					

Table N2	Single-Family				
Planned	2004/2005	2005/2006	2008	2009	2010
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - \$					
projected water savings - AFY					

# of MF pre-1992 units \_\_\_\_\_

Table N3	Multi-Family				
Actual	2001	2002	2003	2004	2005
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - \$					
actual water savings - AFY					

Table N4	Multi-Family				
Planned	2006	2007	2008	2009	2010
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - \$					
projected water savings - AFY					

Is a toilet retrofit on resale ordinance in effect for your service area?

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand \_\_\_\_\_ Reference & Page Number (10631 (f)(4))

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table N5 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**2005 Urban Water Management Plan Review for Completeness Form (Water Code §10620 (d)(1)(2) - 10645**

(Water Code §10620 (d)(1)(2) - 10645, the 2005 Urban Water Management Plan Review for Completeness Form is found on Sheet 1

**2005 Urban Water Management Plan "Review of DMMs for Completeness" Form**  
**For DWR Review Staff Use**

East Orange County Water District (Retail)

**Water Survey Programs for Single-Family and Multi-Family Residential Customers (10631 f(1)(a))**

**Implementation**

**(Section 10631 (f))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6,p.6-2 Reference & Page Number

Year program started Ongoing or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6,p.6-2 Reference & Page Number

Table A1					
Actual	2001	2002	2003	2004	2005
# of single family surveys	<b>Informal program; past data not required to track</b>				
# of multifamily surveys					
actual expenditures - \$					
actual water savings - AFY					

Table A2					
Planned	2006	2007	2008	2009	2010
# of single family surveys					
# of multifamily surveys					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6,p.6-2 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table A3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water (\$ per AF)	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Residential Plumbing Retrofit (10631 (f)(1)(b))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-2 Reference & Page Number

Year program started 1991 or Year program scheduled to start \_\_\_\_\_

- Describes steps necessary to implement measure Sec 6, p.6-2 Reference & Page Number

# of pre-1992 SF accounts \_\_\_\_\_ # of pre-1992 MF accounts \_\_\_\_\_

Table B1					
Actual	1992-2001	2002	2003	2004	2005
# of single family devices	<b>Past information not required to track</b>				
# of multi-family devices					
actual expenditures - \$					
actual water savings - AFY					

Table B2					
Planned	2006	2007	2008	2009	2010
# of single family devices					
# of multi-family devices					
projected expenditures - \$					
projected water savings - AFY					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-2 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-2 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table B3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**System Water Audits, Leak Detection and Repair (10631 (f)(1)(c))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-3 Reference & Page Number

Year program started Ongoing or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p.6-3 Reference & Page Number

Year of last complete audit \_\_\_\_\_ Year of next complete audit \_\_\_\_\_

Table C1					
Actual	2001	2002	2003	2004	2005
% of unaccounted water				2.4	2.5
miles of mains surveyed	<i>Past information not required to track</i>				
miles of lines repaired					
actual expenditures - \$					
actual water savings - AFY					

Table C2					
Planned	2006	2007	2008	2009	2010
% of unaccounted water	2.5	2.5	2.5	2.5	2.5
miles of mains surveyed	<i>Ongoing "inform and response" program</i>				
miles of lines repaired					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-3 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-3 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table C3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Metering with Commodity Rates (10631 (f)(1)(d))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2))
 

Year program started	<u>                    </u>	Ongoing	or	Year program scheduled to start	<u>                    </u>
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Sec 6, p.6-3 Reference & Page Number
- Describes steps necessary to implement measure
 

Total number of accounts	<u>          1192          </u>	# of accounts w/o commodity rates	<u>                    </u>
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Sec 6, p.6-3 Reference & Page Number

Table D1					
Actual	2001	2002	2003	2004	2005
# of unmetered accounts	0	0	0	0	0
# of retrofit meters installed					
# of accounts w/o commodity rates					
actual expenditures - \$					
actual water savings - AFY					



Table D2					
Planned	2006	2007	2008	2009	2010
# of unmetered accounts	0	0	0	0	0
# of retrofit meters installed					
# of accounts w/o commodity rates					
projected expenditures - \$					
projected water savings - AFY					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-3 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-3 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table D3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Large Landscape Conservation Programs and Incentives (10631 (f)(1)(e))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-4 Reference & Page Number

Year program started 2001 or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-4 Reference & Page Number

# of landscape accounts 14 # of landscape accounts with budgets \_\_\_\_\_  
 # of CII accounts 1 # of CII accounts w/ landscape surveys \_\_\_\_\_  
 (CII mixed use meters)

Table E1					
Actual	2001	2002	2003	2004	2005
# of budgets developed	<b>Past information not required to track; undertermined from regional agencies implementing</b>				
# of surveys completed					
# of follow-up visits					
actual expenditures - \$					
actual water savings - AFY					

Table E2					
Planned	2006	2007	2008	2009	2010
# of budgets developed					
# of surveys completed					
# of follow-up visits					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-4 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table E3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**High-Efficiency Washing Machine Rebate Programs (10631 (f)(1)(f))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2))
  - Year program started 2001/2002 or Year program scheduled to start \_\_\_\_\_
  - Other agencies offer rebates \_\_\_\_\_ Cost-effectiveness calcs attached \_\_\_\_\_
- Describes steps necessary to implement measure
  - \_\_\_\_\_ Reference & Page Number Sec 6, p.6-5

Table F1					
Actual	2001	2002	2003	2004	2005
\$ per rebate	<i>Collective 2001-2004</i>			\$100	
# of HECW rebates				31	
actual water savings - AFY				4	

Table F2					
Planned	2006	2007	2008	2009	2010
\$ per rebate	<b>Collective 2005-2010</b>				\$100
# of HECW rebates					50
projected water savings - AFY					6

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-5 Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) Sec 6, p.6-5 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table F3 - 10631 (g)(2)	
<b>Cost Effectiveness Summary</b>	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>
Municipal Water District of Orange County

**Public Information Programs (10631 (f)(1)(g))**

**Implementation**

**(Section 10631 (f))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p.6-6 Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p.6-6 Reference & Page Number

Table G1					
Actual	2001	2002	2003	2004	2005
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures	X	X	X	X	X
d. Bill showing water usage in comparison to previous year's usage	X	X	X	X	X
e. Demonstration Gardens	X	X	X	X	X
f. Special Events, Media Events	X	X	X	X	X
g. Speaker's Bureau	X	X	X	X	X
h. Program to coordinate with other government agencies, industry and public interest groups and media	X	X	X	X	X
actual expenditures - \$					

Table G2					
Planned	2006	2007	2008	2009	2010
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures	X	X	X	X	X
d. Bill showing water usage in comparison to previous year's usage	X	X	X	X	X
e. Demonstration Gardens	X	X	X	X	X
f. Special Events, Media Events	X	X	X	X	X
g. Speaker's Bureau	X	X	X	X	X
h. Program to coordinate with other government agencies, industry and public interest groups and media	X	X	X	X	X
Projected expenditures - \$					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p.6-6 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table G3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**School Education Programs (10631 (f)(1)(h))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-7 Reference & Page Number

Year program started 1979/1980 or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-7 Reference & Page Number

Table H1		No. of class presentations				
Actual	# of classes	2000/2001	2001/2002	2003	2004	2005
Grades K-6th		2,373	1,277			
Grades 7th-8th						
High School						
actual expenditures - \$						

Table H2		No. of class presentations				
Actual	# of classes	2006	2007	2008	2009	2010
Grades K-3rd	<b>Projections included with MWDOC regional program</b>					
Grades 4th-6th						
Grades 7th-8th						
High School						
projected expenditures - \$						

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) Sec 6, p. 6-7 Reference & Page Number
- Did your agency's material meet state education framework requirements? \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table H3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**Conservation Programs for Commercial, Industrial and Institutional (10631 (f)(1)(i))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-8 Reference & Page Number
- Year program started 1995/96 or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure

Sec 6, p. 6-8 Reference & Page Number

# of Commercial accounts 1 # of Industrial accounts \_\_\_\_\_ # of Institutional accounts \_\_\_\_\_

Table I1					
Actual	2001	2002	2003	2004	2005
# of surveys completed					
Were incentives provided?					
# of follow-up visits					
actual expenditures - \$					
actual water savings - AFY					

Table I2					
Planned	2006	2007	2008	2009	2010
# of surveys completed					
Were incentives provided?					
# of follow-up visits					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3))

Sec 6, p. 6-8 Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4))

\_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

Evaluate legal authority (10631 (g)(4))

Evaluate economic and non-economic factors (10631 (g)(1))

Evaluate environmental, social, health factors (10631 (g)(1))

Evaluate customer impact & technological factors (10631 (g)(1))

Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))

Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table I3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	



**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County, Orange County Water District

**Conservation Programs for Commercial, Industrial & Institutional - Toilet Replacement (10631 (f)(1)(i))**

(this data is part of the Council Annual Report but is not specifically requested in the UWMP Act)

change

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) \_\_\_\_\_ Reference & Page Number

Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure \_\_\_\_\_ Reference & Page Number

Table I4					
Actual	2001	2002	2003	2004	2005
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
actual expenditures - \$					
actual water savings - AFY					

Table I5					
Planned	2006	2007	2008	2009	2010
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
projected expenditures - \$					
projected water savings - AFY					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) \_\_\_\_\_ Reference & Page Number

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table I6 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Wholesale Agency Programs (10631 (f)(1)(j))**

- Not a wholesale agency

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2))
 

_____	Reference & Page Number
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- Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_
- # of suppliers you serve \_\_\_\_\_

- Describes steps necessary to implement measure
 

_____	Reference & Page Number
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Table J1	Number of agencies assisted				
program activities	2001	2002	2003	2004	2005
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC					
CII ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
UFLT Replacement					
actual expenditures - \$					

Table J2	Number of agencies to be assisted				
program activities	2006	2007	2008	2009	2010
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC					
CII ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
UFLT Replacement					
projected expenditures - \$					

- Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f)(3)) \_\_\_\_\_ Reference & Page Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631(f)(4)) \_\_\_\_\_ Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

Table J3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**Conservation Pricing (10631 (f)(1)(k))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-9 Reference & Page Number
- Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_
- Agency provides sewer service
- Describes steps necessary to implement measure Sec 6, p. 6-9 Reference & Page Number

Table K1				
RETAILERS				
<b>Residential</b>				
Water Rate Structure	Uniform		Sewer Rate Structure	pop-up list
Year rate effective			Year rate effective	
<b>Commercial</b>				
Water Rate Structure	Uniform		Sewer Rate Structure	pop-up list
Year rate effective			Year rate effective	
<b>Industrial</b>				
Water Rate Structure			Sewer Rate Structure	pop-up list
Year rate effective			Year rate effective	
<b>Institutional/Government</b>				
Water Rate Structure	Uniform		Sewer Rate Structure	pop-up list
Year rate effective			Year rate effective	
<b>Irrigation</b> Uniform				
Water Rate Structure				
Year rate effective				
<b>Other</b>				
Water Rate Structure			Sewer Rate Structure	pop-up list
Year rate effective			Year rate effective	
Table K2				
WHOLESALEERS				
Water Rate Structure				
Year rate effective				

**Provided an evaluation for this DMM if it is not implemented**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

**(Section 10631 (g))**

Table K3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

<b>Agency Name</b>

**Water Conservation Coordinator (10631 (f)(1)(l))**

**Implementation**

**(Section 10631 (f) & (h))**

Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-10 Reference & Page Number

Year program started Ongoing or Year program scheduled to start \_\_\_\_\_

Describes steps necessary to implement measure Sec 6, p. 6-10 Reference & Page Number

Table L1					
Actual	2001	2002	2003	2004	2005
# of full-time positions	1	1	1	1	1
# of full/part-time staff					
actual expenditures - \$					

Table L2					
Planned	2006	2007	2008	2009	2010
# of full-time positions	1	1	1	1	1
# of full/part-time staff					
projected expenditures - \$					

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table L3 - 10631 (g)(2)	
Cost Effectiveness Summary	
Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water	
Water Savings (AFY)	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

- If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**Waste Water Prohibition (10631 (f)(1)(m))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-10 Reference & Page Number  
 Year program started 1991 or Year program scheduled to start \_\_\_\_\_

- Describes steps necessary to implement measure Sec 6, p. 6-10 Reference & Page Number

Table M1					
Actual	2001	2002	2003	2004	2005
waste ordinance in effect	X	X	X	X	X
# of on-site visits	<i>Past information not required to track</i>				
water softener ordinance					
actual expenditures - \$					

Table M2					
Planned	2006	2007	2008	2009	2010
waste ordinance in effect	X	X	X	X	X
# of on-site visits					
water softener ordinance					
projected expenditures - \$					

Describe the methods, if any, used to evaluate the effectiveness of this demand management measure (10631 (f) (3)) Sec 6, p. 6-10 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table M3 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name

**Residential Ultra-Low-Flush Toilet Replacement Programs (10631 (f)(1)(n))**

**Implementation**

**(Section 10631 (f) & (h))**

- Describe demand management measure currently being implemented or scheduled for implementation (10631 (f) (1)(2)) Sec 6, p. 6-10 Reference & Page Number  
 Year program started \_\_\_\_\_ or Year program scheduled to start \_\_\_\_\_  
 # of SF pre-1992 accounts \_\_\_\_\_
- Describes steps necessary to implement measure Sec 6, p. 6-10 Reference & Page Number



Table N1	Single-Family and Multi-Family				
Actual	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
# of ULF rebates	17	15	50	41	44
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - \$					
actual water savings - AFY	<b>Total of 44 afy cummulative at 2005/06</b>				

Table N2	Single-Family				
Planned	2004/2005	2005/2006	2008	2009	2010
# of ULF rebates	19	1			
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - \$					
projected water savings - AFY		44			

# of MF pre-1992 units \_\_\_\_\_

Table N3	Multi-Family <i>(combined with SFR)</i>				
Actual	2001	2002	2003	2004	2005
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - \$					
actual water savings - AFY					

Table N4	Multi-Family				
Planned	2006	2007	2008	2009	2010
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - \$					
projected water savings - AFY					

Is a toilet retrofit on resale ordinance in effect for your service area?

Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) Sec 6, p. 6-10 Reference & Page Number

**Provided an evaluation for this DMM if it is not implemented**

**(Section 10631 (g))**

- Evaluate legal authority (10631 (g)(4))
- Evaluate economic and non-economic factors (10631 (g)(1))
- Evaluate environmental, social, health factors (10631 (g)(1))
- Evaluate customer impact & technological factors (10631 (g)(1))

Table N5 - 10631 (g)(2)	
Cost Effectiveness Summary	
<b>Total Costs</b>	
<b>Total Benefits</b>	
<b>Discount Rate</b>	
<b>Time Horizon</b>	
<b>Cost of Water</b>	
<b>Water Savings (AFY)</b>	

- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))

**If Another Agency Implementing**

If another Agency is implementing (10631 (g)(4))

Agency Name
Municipal Water District of Orange County

**2005 Urban Water Management Plan Review for Completeness Form (Water Code §10620 (d)(1)(2) - 10645**

(Water Code §10620 (d)(1)(2) - 10645, the 2005 Urban Water Management Plan Review for Completeness Form is found on Sheet 1

APPENDIX D

***NOTICE OF PUBLIC HEARING AND  
RESOLUTION FOR PLAN ADOPTION***





**ORANGE COUNTY REPORTER**  
- SINCE 1921 -

600 W SANTA ANA BLVD, SANTA ANA, CA 92701  
Telephone (714) 543-2027 / Fax (714) 542-8841

GENERAL MANAGER  
EAST ORANGE COUNTY WATER DIST  
185 MCPHERSON RD.  
ORANGE, CA - 92669

**PROOF OF PUBLICATION**

(2015 5 C C P)

State of California )  
County of ORANGE ) ss

Notice Type: HRG - NOTICE OF HEARING

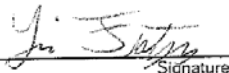
Ad Description: EAST ORANGE CO WATER DIST HEARING

I am a citizen of the United States and a resident of the State of California; 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 printer and publisher of the ORANGE COUNTY REPORTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 06/20/1922, Case No. 13421 That the notice, of which the annexed is a 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:

11/30/2005

Executed on: 11/30/2005  
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct

  
Signature

This space for filing stamp only

OR #: 897964

NOTICE OF PUBLIC HEARING  
EAST ORANGE COUNTY WATER  
DISTRICT

PUBLIC HEARING ON ADOPTION OF  
THE  
EAST ORANGE COUNTY WATER  
DISTRICT  
2005 URBAN WATER MANAGEMENT  
PLAN

NOTICE IS HEREBY GIVEN that the EAST ORANGE COUNTY WATER DISTRICT ("EOCWD") will hold a public hearing to consider adoption of EOCWD's 2005 Urban Water Management Plan in accordance with Section 10642 of the Urban Water Management Planning Act. The purpose of the hearing will be to solicit public comment prior to the adoption of the plan.

Copies of the Urban Water Management Plan are available for public inspection at the East Orange County Water District, 185 N. McPherson, Orange, California. Additional information on the above plan and/or public hearing may be obtained by contacting the District's General Manager William Redcay at 714 538-5815.

The Board of Directors of EOCWD will hold the hearing on Thursday evening, December 15, 2005, at 5:00 p.m. or as soon thereafter as is reasonably practicable, in the offices of EOCWD located at 185 McPherson Orange California

DATED: November 30 2005  
/s/ JOAN C ARNESON, Secretary  
EAST ORANGE COUNTY WATER  
DISTRICT  
and of the Board of Directors  
thereof  
11/30/05

OR-897964#

**AFFIDAVIT OF PUBLICATION**

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

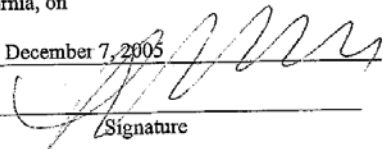
I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa 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 1/18/52, 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:

December 7, 2005

"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: December 7, 2005

  
Signature

**The Orange County Register**  
625 N. Grand Ave.  
Santa Ana, CA 92701  
(714) 796-7000 ext. 2209

**PROOF OF PUBLICATION**

This space is for the County Clerk's Filing Stamp

Proof of Publication of

NOTICE OF PUBLIC HEARING  
EAST ORANGE COUNTY WATER DISTRICT  
PUBLIC HEARING ON ADOPTION OF THE  
EAST ORANGE COUNTY WATER DISTRICT  
2005 URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the EAST ORANGE COUNTY WATER DISTRICT (EOCWD) will hold a public hearing to consider adoption of EOCWD's 2005 Urban Water Management Plan in accordance with Section 10642 of the Urban Water Management Planning Act. The purpose of the hearing will be to solicit public comment prior to the adoption of the plan.

Copies of the Urban Water Management Plan are available for public inspection at the East Orange County Water District, 185 N. McPherson, Orange, California. Additional information on the above plan and/or public hearing may be obtained by contacting the District's General Manager, William Redcay, at 714 538-5815.

The Board of Directors of EOCWD will hold the hearing on Thursday evening, December 15, 2005, at 5:00 p.m. or as soon thereafter as is reasonably practicable, in the offices of EOCWD located at 185 McPherson, Orange, California.

DATED: November 30, 2005

/s/ JOAN C. ARNISON, Secretary  
EAST ORANGE COUNTY WATER DISTRICT  
and of the Board of Directors  
thereof

Pub: OC Register December 7, 2005 R2548/6899122

**RESOLUTION NO. 037**

**RESOLUTION OF THE BOARD OF DIRECTORS OF  
THE EAST ORANGE COUNTY WATER DISTRICT  
ADOPTING 2005 URBAN WATER MANAGEMENT PLAN**

WHEREAS, every urban water supplier is required by California Water Code Section 10610 *et seq.* to prepare and adopt an urban water management plan; and

WHEREAS, the East Orange County Water District (EOCWD) is an urban water supplier, which is defined to include a publicly owned supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet annually; and

WHEREAS, the conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level; and

WHEREAS, EOCWD has completed a 2005 Urban Water Management Plan (2005 Plan) pursuant to the requirements of the Urban Water Management Planning Act; and

WHEREAS, the 2005 Plan is a general information document that is intended to complement the Municipal Water District of Orange County 2005 Regional Urban Water Management Plan and provide a local perspective and analysis of the current and alternative water demand and supplies, and conservation activities of EOCWD including effects and measures of coping with short-term and chronic water shortages within the EOCWD boundaries; and

WHEREAS, a public hearing on the 2005 Plan has been duly called and held as required by law.

NOW, THEREFORE, the Board of Directors of the East Orange County Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. The 2005 Regional Urban Water Management Plan is hereby approved and adopted by EOCWD.

Section 2. The Secretary is directed to file a copy hereof with the Department of Water

Resources.

ADOPTED, SIGNED AND APPROVED this 15<sup>th</sup> day of December, 2005.

*Douglas M. Chapman*  
Vice President  
EAST ORANGE COUNTY WATER DISTRICT  
and of the Board of Directors  
thereof

*James C. [Signature]*  
Secretary  
EAST ORANGE COUNTY WATER DISTRICT  
and of the Board of Directors  
thereof





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## APPENDIX E

### ***REFERENCES***





**East Orange County**  
**2005 Urban Water Management Plan**

**REFERENCES**

- 
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May 2004

APPENDIX F

***RESOLUTION No. 422 DROUGHT MANAGEMENT PLAN  
and ORDINANCE NO. 1991-1 CONSERVATION PHASES  
I-III***

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RESOLUTION NO. 422

RESOLUTION OF THE BOARD OF DIRECTORS OF EAST  
ORANGE COUNTY WATER DISTRICT ADOPTING A  
VOLUNTARY WATER CONSERVATION PROGRAM REDUCING  
WATER CONSUMPTION BY TEN PERCENT

WHEREAS, periodic droughts are a historic fact in the State of California; and

WHEREAS, because precipitation for the current water year has been substantially below normal particularly in the watersheds of the imported water supplies serving Southern California, the California Department of Water Resources has declared 1988 to be a critically dry year, and many communities in the State will suffer water shortages; and

WHEREAS, a drought management program is essential to reduce the risk and severity of water shortages should the drought continue into 1989; and

WHEREAS, the Governor of the State of California has asked all Californians to conserve water on a voluntary basis; and

WHEREAS, the Metropolitan Water District of Southern California (Metropolitan), in recognition of the critical water conditions existing in the State, has notified the agricultural industry within its service area of possible curtailment of agricultural water deliveries in 1989 should dry weather patterns continue; and

WHEREAS, the Municipal Water District of Orange County's (MWDOC) fundamental responsibilities are to obtain water from Metropolitan and other sources, to distribute adequate supplies of high quality imported water to the public at the lowest feasible cost, and to conserve such supplies in times of shortages; and

WHEREAS, in recognition of the critical water conditions existing in California, the MWDOC Board of Directors approved Resolution No. 1352 on the California Drought on June 1, 1988; and

WHEREAS, the Resolution requests every water supplier within MWDOC's service area to alert its customers to the necessity and means of saving water and to carefully monitor water uses to prevent waste and request every water supplier within MWDOC's service area to develop and implement specific water conservation measures with a goal of reducing water by 10 percent; and

WHEREAS, East Orange County Water District (EOCWD) is a water supplier within MWDOC's service area and has the power and authority to adopt water conservation measures as appropriate within its boundaries;

NOW, THEREFORE, the Board of Directors of EOCWD does hereby RESOLVE, DETERMINE AND ORDER as follows:

Section 1. The General Manager is authorized to implement a voluntary drought management program, with a goal of reducing water use by 10 percent, to reduce the risk and severity of water shortages should the drought continue in 1989.

Section 2. EOCWD urges all consumers to:

- a. Adjust sprinklers and irrigation systems to avoid over-spray, run-off and waste;
- b. Avoid watering in the hot part of the day and during morning and evening peak hours (6:00 a.m. - 9:00 a.m. and 4:00 p.m. - 8:00 p.m.), and avoid watering on windy days;
- c. Install low-watering landscaping and energy efficient irrigation systems where appropriate;
- d. Shut off decorative fountains unless a water recycling system is used;
- e. Not hose down driveways, sidewalks and other paved surfaces, except for health or sanitary reasons;
- f. Install pool and spa covers to minimize water loss due to evaporation;

g. Not waste water while washing cars, or other vehicles and use a bucket or a hose with an automatic cutoff valve;

h. Retrofit indoor plumbing fixtures with low-flow devices;

i. Check faucets, toilets, and pipes (both indoor and outdoor) for leaks and repair immediately;

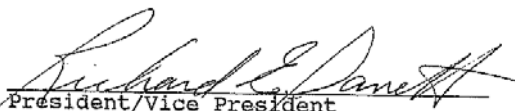
j. Reduce other interior or exterior uses of water to eliminate excessive waste.


Section 3. EOCWD will encourage restaurants within its jurisdiction not to serve drinking water to any customer except upon request and to notify customers through appropriate written notification in all serving areas.

Section 4. EOCWD finds that a phased program beginning with voluntary measures to reduce consumption will best achieve the goal of conserving the water supply without causing unnecessary adverse economic consequences.

Section 5. If voluntary measures do not achieve the goal of a 10 percent reduction in water use, EOCWD will consider the adoption of a mandatory water conservation program. The staff and legal counsel are directed to prepare such a program for the consideration of the EOCWD Board of Directors.

ADOPTED, SIGNED AND APPROVED this 21st day of July, 1988.

  
\_\_\_\_\_  
President/Vice President  
EAST ORANGE COUNTY WATER DISTRICT  
and of the Board of Directors  
thereof

  
\_\_\_\_\_  
Secretary  
EAST ORANGE COUNTY WATER DISTRICT  
and of the Board of Directors  
thereof

STATE OF CALIFORNIA )  
 ) ss.  
COUNTY OF ORANGE )

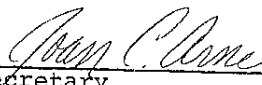
I, JOAN C. ARNESON, Secretary of the Board of Directors of the EAST ORANGE COUNTY WATER DISTRICT, do hereby certify that the foregoing Resolution No. 422 was duly adopted by the Board of Directors of said District at a Regular Meeting of said District held on July 21, 1988, and that it was so adopted by the following vote:

AYES: BARRETT, CHAPMAN, MURRILL, PROVOST

NOES: NONE

ABSENT: VANDERWERFF

ABSTAIN: NONE

  
Secretary  
EAST ORANGE COUNTY WATER DISTRICT  
and of the Board of Directors  
thereof

ORDINANCE NO.  
1991-1  
EAST ORANGE COUNTY WATER DISTRICT  
RETAIL ZONE

AN ORDINANCE  
TO CONSERVE THE AVAILABLE WATER SUPPLY

CONSERVATION OF PUBLIC WATER SUPPLY

GENERAL PROVISIONS

**PURPOSE.**

The purpose of this Ordinance is to prevent the waste or unreasonable use of water and to provide a mandatory water conservation plan during a proclaimed water shortage. Because of the water supply conditions prevailing in the area of this state from which the East Orange County Water District (the District) obtains a portion of its supply, the general welfare requires that the conservation of such water be practiced for the benefit of the people of the District and for the public welfare. Voluntary conservation efforts have not accomplished this. The Ordinance shall apply within the Retail Zone of the District.

**AUTHORIZATION.**

The General Manager is authorized and empowered to enforce and administer the provisions of this Ordinance.

**PUBLIC HEALTH AND SAFETY NOT TO BE AFFECTED.**

Nothing in this Ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

**ENVIRONMENT.**

This Ordinance and the actions hereafter taken pursuant thereto are exempt from the provisions of the California Environmental Quality Act of 1970 as a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Section 507 (c) of the State EIR Guidelines.

## PHASING

### PHASING.

Phasing shall refer to the Board action of declaring water conservation Phase I, II, or III, by resolution. If the Board of Directors shall adopt a resolution determining that the water shortage has been alleviated to an extent that this Ordinance is no longer needed, the Ordinance shall thereby be terminated and of no further effect.

## GENERAL PROHIBITIONS

### LEAKS.

All customers shall repair all leaks from indoor and outdoor plumbing fixtures. It shall be presumed that a period of forty-eight hours after the consumer discovers such a leak or break, or receives notice from the District of such leak or break, whichever occurs first, is a reasonable time in which to correct such leak or break.

### RUNOFF.

No customer shall cause or allow water to run off landscape areas into adjoining streets, sidewalks, or other paved surfaces due to incorrectly directed or maintained sprinklers, or excessive watering.

### WASHING OF VEHICLES AND EQUIPMENT.

Washing of motor vehicles, trailers, boats, and other types of mobile equipment shall be done only with a hand held bucket or a hose with a positive shutoff nozzle for quick rinses, except that washing may be done at the immediate premises of a commercial car wash.

## REGULATIONS GOVERNING WATER CONSERVATION PHASES

### DETERMINATION OF CONSERVATION PHASE.

The East Orange County Water District Board of Directors shall make findings of shortages and declare the applicable water conservation phase by resolution. The Metropolitan Water District of Southern California may raise or lower its water rates, penalties and credits during a proclaimed water shortage. The District will adjust its water rates accordingly.

### WATER CONSERVATION PHASE I

During water conservation Phase I no person shall:

- (a) Wash sidewalks, walkways, driveways, parking areas, or other paved surfaces, except as is required to dispose of dangerous liquids or substances dangerous to the public health and safety.
- (b) Water lawn, landscape, or other turf areas except between the hours of 4:00 p.m. and 10:00 a.m.
- (c) Use water to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recycling system.
- (d) Serve drinking water to any customer unless expressly requested. Nor shall any restaurant, hotel cafe, cafeteria or other public place where food is sold, served or offered for sale, serve drinking water to any customer unless expressly requested.

### WATER CONSERVATION PHASE II

During water conservation Phase II no person shall:

- (a) Violate the provisions of Phase I. Lawn watering and landscape irrigation, including construction meter irrigation, is not permitted between the hours of 10:00 a.m. and 6:00 p.m. any day. Watering is permitted at anytime if a hand-held hose equipped with a positive shut-off nozzle is used, or a drip irrigation system is used. Watering shall be done as needed only.
- ~~(b) Water lawn, landscape or other turf areas of commercial nurseries or golf courses except between the hours of 6:00 p.m. and 6:00 a.m. There shall be no restriction on watering utilizing reclaimed water.~~
- (c) Make, cause, use or permit the use of water for any purpose in an amount in excess of eighty-five percent (85%) of the amount used on that customer's premises during the corresponding billing period of the base period as determined by the Board of Directors.

- (d) Filling, refilling, or adding of water to swimming pools, spas, ponds, and artificial lakes, is prohibited. An appeal process will be established to allow for the evaluation of a variance if any of the above are required as preventive maintenance to protect the customer's investment. If a variance is granted, a water rate less than the full penalty rate will be administered.

### WATER CONSERVATION PHASE III

During water conservation Phase III no person shall:

- (a) Violate the provisions of Phase I and II, except that the restrictions on watering lawn, landscape, or other turf areas, be modified to permit the above only on designated irrigation days and only between the hours of 6:00 p.m. and 6:00 a.m. A "designated irrigation day" is determined by the last digit in the street address. Properties with addresses ending in an even number may irrigate on even numbered days and addresses ending with odd numbers may irrigate on odd numbered days.
- (b) Use water from fire hydrants except for fire fighting and related activities. Other uses of water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.
- (c) Water shall not be used to wash down streets, gutters, sidewalks, driveways, parking areas, tennis courts, patios, pool decks, or other paved areas, except to alleviate immediate fire or sanitation hazards.
- (d) Washing of autos, trucks, mobile homes, buses, trailers, boats, and other types of mobile equipment is prohibited. Washing is permitted at any time upon the immediate premises of a commercial car wash.
- (e) ~~Filling, refilling, or adding of water to swimming pools, spas, ponds, and artificial lakes is prohibited. An appeal process will be established to allow for the evaluation of a variance if any of the above are required as preventive maintenance to protect the customer's investment. If a variance is granted, a water rate less than the full penalty rate will be administered.~~
- (f) Use of water for agricultural or commercial nursery purposes, except for livestock watering, is prohibited.



- (g) Restaurants shall not serve water to their customers except when specifically requested.
- (h) The operation of any ornamental fountain or similar structure is prohibited.
- (i) Make, cause, use or permit the use of water for any purpose in excess of eighty percent (80%) of the amount used on the customer premises during the corresponding billing period of the base period as determined by the Board of Directors.

**IMPLEMENTATION OF WATER CONSERVATION PHASE**

- (a) Each month the District shall monitor and evaluate the demand for water by customers and the projected available supply. Upon determination of potential or actual water shortage, the General Manager shall recommend to the Board of Directors any change in the conservation phase which may be necessary in order for the District to prudently supply water to its customers.
- (b) The Board of Directors shall make findings of shortage and declare the conservation phase by resolution. Said resolution shall specify the start date of the conservation phase by resolution. The resolution shall be published once in a daily newspaper of general circulation within the District and shall become effective immediately upon such publication.
- (c) The provisions of Phase II and Phase III requiring a percentage curtailment in the use of water shall be effective the first full billing period commencing on or after the date of such publication.

**ENFORCEMENT OF WATER CONSERVATION PHASES**

Violation by any customer of the general provisions shall be penalized as follows:

- (a) First violation. The General Manager or his designee shall issue a written notice of the fact of a first violation to the customer.
- (b) Second violation. For a second violation during any one proclaimed water shortage, the General Manager or his designee shall impose a surcharge in an amount equal to fifteen (15%) of the customers water bill.
- (c) Third and Subsequent Violations. For a third and each subsequent violation during any one pro-

claimed water shortage, the General Manager or his designee shall impose a surcharge in an amount equal to (30%) of customer's water bill. Also a flow restricting device of one (1) gallon per minute capacity for services up to one and one-half (1-1/2) inch size, and comparatively sized restrictors for larger services, shall be installed on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight (48) hours. The District shall charge the customer the reasonable costs incurred for installing and for removing the flow-restriction devices and for restoration of normal service. The charge for installing and removing a flow-restricting device, and any other penalties or charges due the District from customer, or due from any person who has applied for water service, shall be paid before normal service can be restored. The customer must provide written evidence that violations will not continue prior to removal of the flow restricting device.

#### RELIEF FROM COMPLIANCE

- (a) A customer may file an application for relief from any provision of this section. The General Manager shall develop such procedures as necessary to determine such application and shall, upon the filing by customer of an application for relief, take such steps as reasonably necessary to determine the application for relief.
- (b) The application for relief may include a request that the customer be relieved, in whole or in part, from the water curtailment provisions and shall contain the basis for such request.
- (c) In determining whether to grant relief, and the nature of any relief, the General Manager shall take into consideration all relevant factors including, but not limited to:
  - (1) Whether any additional reduction in water consumption will result in unemployment;
  - (2) Whether additional members have been added to the household;
  - (3) Whether any additional landscape property has been added to the property since the corresponding billing period of the prior calendar year;

- (4) Changes in vacancy factors in multi-family housing.
- (d) In order to be considered, an application for relief must be filed with the General Manager within fifteen (15) days from the date of publication of the resolution from which relief is sought. No relief shall be granted unless the customer shows that he has achieved the maximum practical reduction in water consumption other than in the specific areas in which relief is being sought. No relief shall be granted to any customer who, when requested by the General Manager, fails to provide any information necessary for resolution of the customer's application for relief.
- (e) The decision of the General Manager shall be provided in a written notification to the customer. The Board of Directors shall provide the customer an opportunity to present his position within forty-five (45) days following receipt of the customer's written request for reconsideration.

#### NOTICE OF VIOLATION

The General Manager or his designee shall give notice of violation to the customer committing the violation as follows:

- (a) Notice of violation of the water use curtailment shall be given in writing in the following manner:
- 1 by giving the notice to the customer personally; or
  - 2 if the customer is absent from or unavailable at the premises at which the violation occurred, by leaving a copy with some person of suitable age and discretion at the premises and sending a copy through the regular mail to the address at which the customer is normally billed; or
  - 3 if a person of suitable age or discretion cannot be found, then affixing a copy in a conspicuous place at the premises at which the violation occurred and also sending a copy through the regular mail to the address at which the customer is normally billed.

- (b) The notice shall contain a description of the facts of the violation, a statement of the possible penalties for each violation and a statement informing the customer of his right to a hearing on the merits of the violation.

#### HEARING REGARDING VIOLATION

- (a) Any customer receiving notice of a second or subsequent violation shall have a right to a hearing by the General Manager or his designee provided that a written request for hearing is filed within fifteen days from the date of the notice of violation and the customer deposits with the District a sum equal to the billed surcharge and pays all other outstanding water charges.
- (b) The customer's timely written request for a hearing shall automatically stay installation of a flow-restricting device on the customer's premises until department renders a decision.
- (c) If it is determined that the surcharge was wrongly assessed, the District will refund any money deposited to the customer.
- (d) The decision of the General Manager or his designee shall be provided in a written notification to the customer. The Board of Directors shall provide the customer an opportunity to present his position within forty-five (45) days following receipt of the customer's written request for reconsideration.

If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of the ordinance. The District hereby declares that it would have adopted this ordinance and each section, subsection, sentence, clause, phrase or portion thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases, or portions be declared invalid or unconstitutional.

Neither the adoption of this Ordinance nor the repeal hereby of any ordinance shall in any manner affect the prosecution for violation of ordinances, which violations were committed prior to the effective date hereof, nor be construed as affecting any of the provisions of such ordinance relating to the collection of any such license or penalty or the penal provision applicable to any cash deposit in lieu thereof, required to be posted, filed or deposited pursuant to any ordinance and all rights and obligations thereunder appertaining shall continue in full force and effect.

ORDERED PUBLISHED THIS 29th DAY OF March, 1991.

ADOPTED THIS 21st DAY OF March, 1991

AYES: BARRETT, CHAPMAN, FLETCHER, VEEH

NOES: NONE

ABSENT: VANDERWERFF

ABSTAIN: NONE

/s/ Richard E. Barrett  
VICE PRESIDENT  
EAST ORANGE COUNTY WATER DISTRICT  
AND OF THE BOARD OF DIRECTORS  
THEREOF

ATTEST:

/s/ Joan C. Arneson  
SECRETARY  
EAST ORANGE COUNTY WATER DISTRICT  
AND OF THE BOARD OF DIRECTORS  
THEREOF

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## APPENDIX G

### ***DRAFT WATER SHORTAGE STAGE RESOLUTION***







**DRAFT**

Resolution No. \_\_\_\_\_

**A RESOLUTION OF THE BOARD OF DIRECTORS OF EAST ORANGE COUNTY  
WATER DISTRICT FINDING THE  
EXISTENCE OF A WATER SHORTAGE,  
ORDERING THE IMPLEMENTATION OF STAGE \_\_ OF  
ORDINANCE 1991-1 AND ADOPTING A SCHEDULE OF PENALTIES.**

WHEREAS, the Municipal Water District of Orange County and/or Orange County Water District has implemented a mandatory reduction program for its member agencies, including East Orange County Water District; and

WHEREAS, the East Orange County Board of Directors has Ordinance 1991-1 to regulate water use and implement water conservation, which provides that the Board may, upon finding that a water shortage exists, order implementation of a plan which it deems appropriate to address such water shortage and shall establish a schedule of penalties to be assessed for violation of that plan.

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF  
DIRECTORS OF THE EAST ORANGE COUNTY WATER DISTRICT, AS  
FOLLOWS:**

1. That, for the reasons hereinabove set forth, the Board of Directors hereby finds and determines that a Water Shortage exists in the East Orange County Water District service area.
2. That the Board of Directors hereby orders implementation of the Water Shortage Contingency Plan, Stage \_\_\_\_, as set forth in Ordinance 1991-1.
3. That the following penalties shall be assessed for any violation of the Water Shortage Contingency Plan as follows:
  - a) First Violation – Written notice issued to customer.
  - b) Second Violation – Surcharge in an amount equal to fifteen percent (15%) of the customers water bill imposed.
  - c) Third and Subsequent Violations – Surcharge in the amount of thirty percent (30%) of customer’s water bill will be imposed. Also, a flow restricting device of one (1) gallon per minute capacity for services up to one and one half (1 ½) inch in size and comparatively sized restrictors for larger services, shall be installed. The customer will be charged reasonable costs incurred.

ADOPTED, SIGNED AND APPROVED THIS \_\_\_\_ day of \_\_\_\_\_, 2005.

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PRESIDENT  
EAST ORANGE COUNTY WATER DISTRICT  
and the Board of Directors thereof

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SECRETARY  
EAST ORANGE COUNTY WATER DISTRICT  
and the Board of Directors thereof

**East Orange County Water District**

185 N. Mc Pherson Road, Orange, CA 92869

(714) 538-5815

