

**Final**

# **2010 Urban Water Management Plan Update**



*Prepared for:*



**Western Municipal Water District**

*Prepared by:*

**Kennedy/Jenks Consultants**

**June 2011**





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14 July 2011

Peter Brostrom, Department of Water Resources  
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Subject: Submittal of the 2010 Western Municipal Water District Urban Water Management Plan Update

Dear Mr. Brostrom:

This transmittal letter submits the 2010 Western Municipal Water District Urban Water Management Plan Update. Western prepared this update with participation and input from its member agencies and consistent with the Water Conservation Act of 2009 (Water Code sections 10608.12 to 10608.64) and the Urban Water Management Planning Act (Water Code sections 10610 to 10656).

The Western Board of Directors adopted the update on June 15, 2011. Pursuant to California Water Code Sections 10620(d) and 10644, enclosed are one hard copy and one PDF version of the 2010 Western Municipal Water District Urban Water Management Plan Update.

Please contact me at (951) 571-7212 with any questions on the 2010 Western Municipal Water District Urban Water Management Plan Update.

Very truly yours,

WESTERN MUNICIPAL WATER DISTRICT

A handwritten signature in blue ink that reads "Karly Gaynor".

Karly Gaynor  
Water Resources Analyst



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TRANSMITTAL LETTER

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## LIST OF ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms are used in this report.

AB	Assembly Bill
ACOE	U.S. Army Corps of Engineers
Act	California Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
AWWARF	American Water Works Association Research Foundation
BMPs	Best Management Practices
CCF	One Hundred Cubic Feet
CCR	Consumer Confidence Report
CDA	Chino Desalter Authority
CEQA	California Environmental Quality Act
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DAP	Drought Allocation Plan
DBP	Disinfection by-products
Delta	Sacramento-San Joaquin Delta
DMM	Demand Management Measures
DOF	Department of Finance
DPH	Department of Public Health
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EMWD	Eastern Municipal Water District
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EVMWD	Elsinore Valley Municipal Water District
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
HECW	High Efficiency Clothes Washers
JCSD	Jurupa Community Services District
LAFCO	Local Agency Formation Commission
LHMP	Local Hazard Mitigation Plan
MCL	Maximum Contaminant Level
M&I	Municipal and Industrial
MARB	March Air Reserve Base
Metropolitan	Metropolitan Water District of Southern California
MGD	million gallons per day
MG/L	milligrams per liter

MOU	Memorandum of Understanding
MWD	Metropolitan Water District of Southern California
NPDES	National Pollutant Discharge Elimination System
Plan	Urban Water Management Plan 2010
RCWD	Rancho California Water District
RGPR	Recommended Groundwater Production Report
RHWC	Riverside Highland Water Company
Riverside	City of Riverside
RUSD	Riverside Unified School District
RWQCB	Regional Water Quality Control Board
SAWPA	Santa Ana Watershed Project Authority
SBX7-7	Senate Bill 7 of Special Extended Session 7, the Water Conservation Bill of 2009
SBBA	San Bernardino Basin Area
SCAG	Southern California Association of Governments
SEMS	Standardized Emergency Management System
SWP	State Water Project
TDS	Total Dissolved Solids
UWMP	Urban Water Management Plan
WBIC	Weather Based Irrigation Controller
WCSSP	Water conservation and Supply Shortage Plan
WDF	Water Demand Forecast Model
Western	Western Municipal Water District
WSAP	Water Supply Allocation Plan of Metropolitan Water District of Southern California
WSDM	Water Surplus and Drought Management Plan of Metropolitan Water District of Southern California
WRCRWTP	Western Riverside County Regional Wastewater Treatment Plant Western Municipal Water District
WRP	Waste Water Reclamation Plant

## EXECUTIVE SUMMARY

The Urban Water Management Plan (Plan) is a tool that provides a summary of anticipated supplies and demands for the years 2010 to 2035. This document was prepared for Western Municipal Water District (Western) and discusses both Western's wholesale and retail water supplies and demands. It was prepared in coordination with other water use agencies and land use agencies in Riverside County.

This Plan was prepared consistent with the Urban Water Management Plan Act and the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (DWR 2011). ***The 2010 Urban Water Management Plan Checklist is provided at the end of this Executive Summary.***

Western is the supplemental water supplier for 13 water purveyors within the Western wholesale service area: Box Springs Mutual Water Company, City of Corona, Eagle Valley Mutual Water Company, Elsinore Valley Municipal Water District, Home Gardens County Water District, Jurupa Community Services District, Lee Lake Water District, the City of Norco, Rancho California Water District, City of Riverside, Riverside Highland Water Company, Rubidoux Community Services District, and the Santa Ana River Water Company. Currently, Western serves eight water agency customers with water from the Colorado River, the State Water Project (SWP), as well as water from groundwater desalters. These customers include the City of Corona, City of Norco, City of Riverside, Eagle Valley Mutual Water Company, Elsinore Valley Municipal Water District, Lee Lake Water District, Rancho California Water District, and Jurupa Community Services District. In addition, Western serves water directly to approximately 23,000 domestic and 130 irrigation connections in its retail service area (approximately 85,000 persons). Western's general district (wholesale and retail areas combined) consists of a 527 square mile area of western Riverside County and an estimated population of more than 860,000 people.

Figure ES-1 illustrates Western's service area and the 13 water purveyors within the wholesale area; Figure ES-2 illustrates Western's retail water service areas.

### **Preparation and Implementation of the 2010 Western Urban Water Management Plan**

This Plan has been prepared specifically to evaluate demands on, and supplies of, Western. Other water agencies that receive water from Western are responsible for their own water resources planning. However, this Plan will guide Western actions, both to serve its retail areas and its wholesale customers. Specific demand and supply projections are provided for the Western retail area and more generalized information is provided for the wholesale area.

Western encouraged participation in this plan by member agencies, land use agencies, and entities with common water sources. The public outreach process for the UWMP started with a kickoff meeting describing the UWMP process and soliciting input from Western's wholesale customers and land use entities. A Draft UWMP was made available for public review on June 1, 2011 and a joint hearing on the Plan and plans for compliance with water use targets per

Senate Bill 7 of Special Extended Session 7 (SBX7-7) was held prior to adoption by the Western Board of Directors.

Following adoption, the Plan will be available during normal business hours at Western headquarters:

14205 Meridian Parkway, Riverside, CA, 92518

## Water Demand

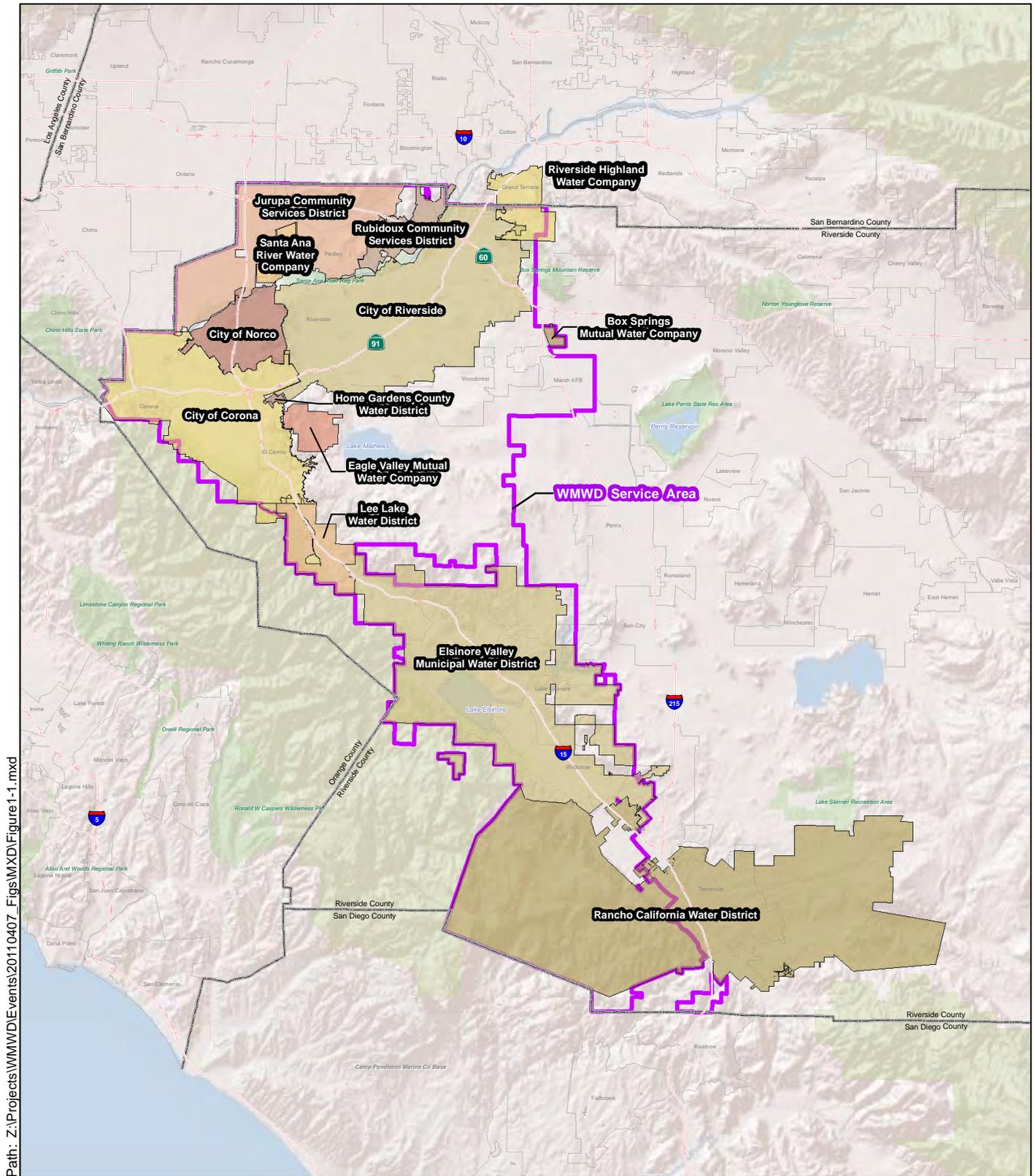
Total water demand within Western's retail area has been increasing since 1995, with demands nearly tripling between 1995 and 2010. By year 2035 forecasted demand will increase by approximately 90%. At buildout (estimated sometime near year 2040), total demands on Western water supplies would be approximately 164,400 AFY, almost double the current demands. Table ES-1 provides the forecasted demands for Western's supplies for years 2015 until buildout, for the retail and wholesale areas.

**Table ES-1  
Total Forecasted Demands on Western's Water Supplies (AF)**

<b>Water Use<sup>1</sup></b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
Total Forecasted Demand for Western Retail Areas (Table 2-12)	32,084	34,538	38,682	42,825	46,968	51,111
Total Forecasted Demand Western Wholesale Area (from Table 2-13)	83,989	86,740	92,908	98,913	105,506	113,100
Total Forecasted Demand "Other Water Uses (Table 2-14)	2,567	2,763	3,095	3,426	3,757	4,089
<i>Total</i>	<i>118,640</i>	<i>124,042</i>	<i>134,684</i>	<i>145,164</i>	<i>156,231</i>	<i>168,300</i>
1 Assumes conservation						

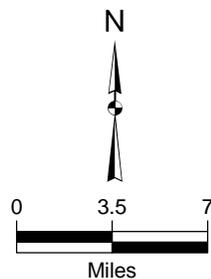
## Water Supplies

Western relies on three existing water sources: groundwater, imported water, and recycled water to meet its wholesale and retail demands. Planned supplies include new groundwater production and expanded recycled water use. Western obtains approximately 90% of its total supply through imported water sources from the Metropolitan Water District (MWD). About one-quarter of the water Western purchases from MWD comes from the Colorado River Aqueduct and about three-quarters from the SWP. Western also purchases water from the Elsinore Valley Municipal Water District (Meeks and Daley purchase) and from the City of Riverside. Western's local supplies come from groundwater in the Arlington, San Bernardino Basin Area (SBBA), and Murrieta basins, as well as recycled water supply from Western's own Water Recycling Facility. Future supplies will be developed locally, in the Perris North, Arlington, and Chino basins, as well as through expansion of the Western Water Recycling Facility. Table ES-2 shows the existing and planned supplies.



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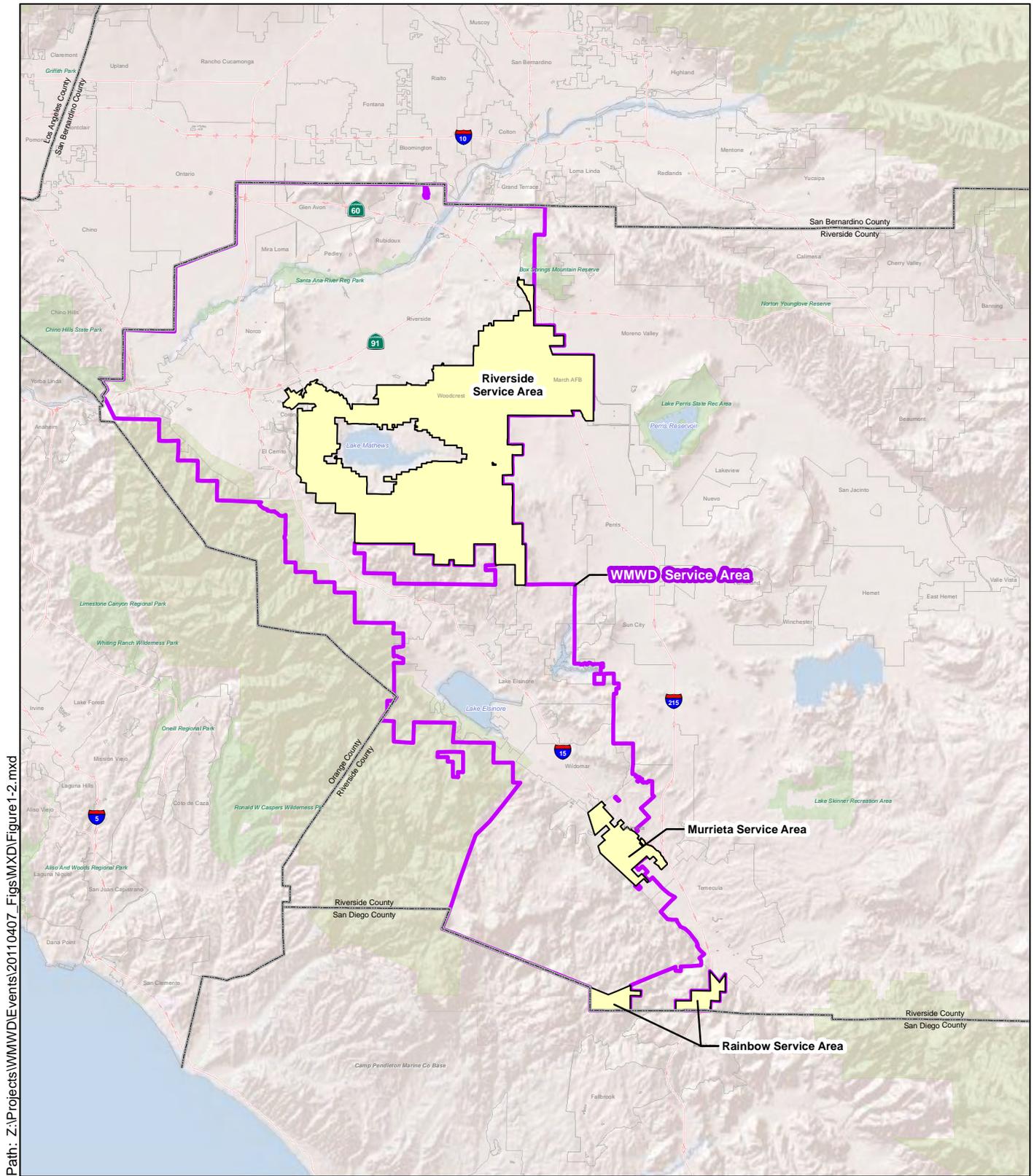
**Kennedy/Jenks Consultants**

Western Municipal Water District  
Riverside County, California

**Western Municipal Water District  
Member Agencies**

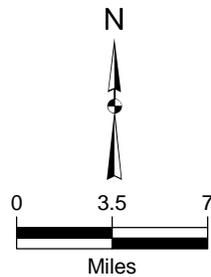
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**Figure ES-1**



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**Kennedy/Jenks Consultants**

Western Municipal Water District  
Riverside County, California

**Western Municipal Water District  
Retail Service Areas**

K/J 108906\*00  
May 2011

**Figure ES-2**

**Table ES-2  
Current and Planned Water Supplies (AF)**

<b>Water Supply Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies</b>							
<b>Wholesale and Purchased</b>							
Metropolitan Water District (Imported)	104,146	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	27,082	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>							
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0	0
Groundwater Murrieta Basin	1,000	1,600	1,600	1,600	1,600	1,600	1,600
Western Water Recycling Facility	950	950	950	950	950	950	950
<b>Banking Programs</b>							
San Bernardino Basin Area	6,000	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>151,778</b>	<b>181,463</b>	<b>204,277</b>	<b>214,281</b>	<b>225,451</b>	<b>238,185</b>	<b>238,185</b>
<b>Planned Supplies</b>							
<b>Local Supplies</b>							
Perris North Groundwater Basin	0	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	0	850	850	850	850	850	850
Chino Desalters Expansion	0	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	0	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>0</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>151,778</b>	<b>186,983</b>	<b>211,357</b>	<b>221,921</b>	<b>234,211</b>	<b>248,065</b>	<b>249,185</b>

## Water Reliability

MWD has evaluated the dependability of Western's imported supplies and concluded that the combination of imported water and expanded local resource programs would ensure that these supplies can be met in the future. Local groundwater and other water purchased through agreements are considered 100% reliable in single-dry or multiple dry years, except for the Temecula-Murrieta Basin supply. Western has only been pumping water from the Temecula-Murrieta Basin since late 2005 and does not have long-term records on water available from this source. To be conservative, until more data is available, Western is assuming its use of Temecula-Murrieta Basin water could be reduced by 15% in a single-dry or multiple dry years.

## Water Use Efficiency

In 2008 Western completed a Water Use Efficiency Master Plan to evaluate water use by sector and to evaluate potential methods for cost, water savings, and ease of implementation. Increases in recycled water delivery and use will assist Western with achieving its water use target.

However, in order to meet the water use targets prescribed by SBX7-7, Western will have to reduce current water use in the retail areas by approximately 5 percent by 2015 and by approximately 10 percent by 2020. The Water Use Efficiency Master Plan identified a substantial opportunity to reduce water consumption for landscape irrigation. Western will target landscape water use in all sectors (residential, commercial, institutional, and industrial) as a means to reduce water consumption consistent with the goals of SBX7-7.

### **Water Shortage Contingency Plan**

As both a wholesale and retail water agency, Western has produced plans to address water supply reductions to member agencies, as well as to individual customers. To date, both a Water Conservation and Supply Shortage Program (WCSSP) and a Drought Allocation Plan (DAP) have been prepared by Western in conjunction with its retail agencies. The DAP provides Western's and its wholesale customers with a means of allocating limited imported water supplies from MWD under shortage conditions. The WCSSP addresses the retail area, and describes six stages of water supply shortages and provides a set of strategies to ensure that water is beneficially used at the customer level.

### **Comparisons of Supply and Demand During Normal, Single-Dry, and Multiple Dry Years**

The UWMP Act requires urban water suppliers assess water supply reliability by comparing total projected water use with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment of single-dry year and multiple-dry years. Western has elected to evaluate water supplies and demands for a 25-year period as well as anticipated conditions once the service area is fully developed. This section presents the reliability assessment for Western's service area.

The Normal/Average year is a year in the historical sequence that most closely represents median runoff levels and patterns (for more information refer to sections 3.2, 3.3, 3.4, and 3.6). This section summarizes Western's water supplies available to meet demands over the 25-year planning period during an average/normal year and compares them to demands for the same period. In Table ES-3, below, demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. Assumptions about supplies and demands are provided in section 2.4 and 3.8. Table ES-3 demonstrates that Western anticipates adequate supplies for years 2015 to 2035 under Normal conditions.

The single-dry year is generally the lowest annual runoff for a water source in the record. The single-dry year may differ for various sources (for more information refer to sections 3.2, 3.3, 3.4, and 3.6). This section summarizes Western's water supplies available to meet demands over a 25-year planning period during a single-dry year and compares them to demands for the same period. In Table ES-4, below, demands are assumed to be 13 percent greater in a single-dry year than during a normal year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. Table ES-4 demonstrates that Western anticipates adequate supplies for years 2015 to 2035 under single-dry year conditions.

The multiple-dry year is generally the lowest annual runoff for a three year or more consecutive period. The multiple-dry year period may differ for various sources (for more information refer to sections 3.2, 3.3, 3.4, and 3.6). This section summarizes Western's water supplies available to meet demands over a 25-year planning period during a multiple-dry year period and compares them to demands for the same time frame. In Table ES-5, below, demands are assumed to be 13 percent greater in a multiple-dry year than during an average year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. Table ES-5 demonstrates that Western anticipates adequate supplies for years 2015 to 2035 under multiple-dry year conditions.

**Table ES-3  
Projected Average/Normal Year Supplies and Demands (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,600	1,600	1,600	1,600	1,600	1,600
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,463</b>	<b>204,277</b>	<b>214,281</b>	<b>225,451</b>	<b>238,185</b>	<b>238,185</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,983</b>	<b>211,357</b>	<b>221,921</b>	<b>234,211</b>	<b>248,065</b>	<b>249,185</b>
Demands without Additional Conservation <sup>2</sup>	129,661	149,565	162,209	174,651	187,827	202,254
Conservation	11,021	21,685	23,227	24,728	26,377	28,275
Total Adjusted Demands <sup>2</sup>	118,640	124,042	134,684	145,164	156,231	168,300
<b>Surplus/Deficit in Normal Year</b>	<b>68,343</b>	<b>87,315</b>	<b>87,237</b>	<b>89,047</b>	<b>91,834</b>	<b>80,885</b>
<b>Difference as % of Supply</b>	<b>37%</b>	<b>41%</b>	<b>39%</b>	<b>38%</b>	<b>37%</b>	<b>32%</b>
<b>Difference as % of Demand</b>	<b>58%</b>	<b>70%</b>	<b>65%</b>	<b>61%</b>	<b>59%</b>	<b>48%</b>
1 From Table 3-1						
2 From Table 2-12, 2-13, 2-14, and 2-15.						

**Table ES-4  
Projected Single-Dry Year Supplies and Demands (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,360	1,360	1,360	1,360	1,360	1,360
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,223</b>	<b>204,037</b>	<b>214,041</b>	<b>225,211</b>	<b>237,945</b>	<b>237,945</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,743</b>	<b>211,117</b>	<b>221,681</b>	<b>233,971</b>	<b>247,825</b>	<b>248,945</b>
Demands without Additional Conservation <sup>2,3</sup>	146,516	169,008	183,296	197,355	212,244	228,547
Conservation	12,453	28,841	31,103	33,320	35,703	38,368
Total Adjusted Demands <sup>2,3</sup>	134,063	140,167	152,193	164,035	176,542	190,179
<b>Surplus/Deficit in Single-Year</b>	<b>52,680</b>	<b>70,950</b>	<b>69,488</b>	<b>69,936</b>	<b>71,283</b>	<b>58,766</b>
<b>Difference as % of Supply</b>	<b>28%</b>	<b>34%</b>	<b>31%</b>	<b>30%</b>	<b>29%</b>	<b>24%</b>
<b>Difference as % of Demand</b>	<b>39%</b>	<b>51%</b>	<b>46%</b>	<b>43%</b>	<b>40%</b>	<b>31%</b>
1 From Table 3-15						
2 From Table 2-12, 2-13, 2-14, and 2-15.						
3 Demands in dry periods anticipated to be 13% higher than in Average year.						

**Table ES-5  
Projected Multiple-Dry Year Supplies and Demands (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,360	1,360	1,360	1,360	1,360	1,360
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,223</b>	<b>204,037</b>	<b>214,041</b>	<b>225,211</b>	<b>237,945</b>	<b>237,945</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,743</b>	<b>211,117</b>	<b>221,681</b>	<b>233,971</b>	<b>247,825</b>	<b>248,945</b>
Demands without Additional Conservation <sup>2,3</sup>	146,516	169,008	183,296	197,355	212,244	228,547
Conservation	12,453	28,841	31,103	33,320	35,703	38,368
Total Adjusted Demands <sup>2,3</sup>	134,063	140,167	152,193	164,035	176,542	190,179
<b>Surplus/Deficit in Multiple-Dry Year</b>	<b>52,680</b>	<b>70,950</b>	<b>69,488</b>	<b>69,936</b>	<b>71,283</b>	<b>58,766</b>
<b>Difference as % of Supply</b>	<b>28%</b>	<b>34%</b>	<b>31%</b>	<b>30%</b>	<b>29%</b>	<b>24%</b>
<b>Difference as % of Demand</b>	<b>39%</b>	<b>51%</b>	<b>46%</b>	<b>43%</b>	<b>40%</b>	<b>31%</b>
1 From Table 3-16						
2 From Table 2-12, 2-13, 2-14, and 2-15.						
3 Demands in dry periods anticipated to be 13% higher than in Average year.						

**Table I-1 Urban Water Management Plan checklist, organized by legislation number**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	System Demands		
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	System Demands	Retailer and wholesalers have slightly different requirements	
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not applicable	Standardized form not yet available	
4	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.	10620(d)(2)	Plan Preparation		
5	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.	10620(f)	Water Supply Reliability . . .		
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.	10621(b)	Plan Preparation		
7	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).	10621(c)	Plan Preparation		

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
8	Describe the service area of the supplier	10631(a)	System Description		
9	(Describe the service area) climate	10631(a)	System Description		
10	(Describe the service area) current and projected population . . . 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 . . .	10631(a)	System Description	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		
13	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).	10631(b)	System Supplies	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .?	10631(b)	System Supplies	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
15	(Provide 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. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies		
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies		
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	System Supplies		
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	System Supplies		
19	For basins that have not been adjudicated, (provide) 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.	10631(b)(2)	System Supplies		
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(3)	System Supplies		
21	(Provide 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.	10631(b)(4)	System Supplies	Provide projections for 2015, 2020, 2025, and 2030.	

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
22	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: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Water Supply Reliability . . .		
23	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.	10631(c)(2)	Water Supply Reliability . . .		
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies		
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), 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.	10631(e)(1)	System Demands	Consider "past" to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
26	(Describe and provide a schedule of implementation for) 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.	10631(f)(1)	DMMs	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	
27	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.	10631(f)(3)	DMMs		
28	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.	10631(f)(4)	DMMs		

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
29	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.	10631(g)	DMMs	See 10631(g) for additional wording.	
30	(Describe) 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.	10631(h)	System Supplies		
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	System Supplies		

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	
33	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).	10631(k)	System Demands	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	System Demands		
35	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.	10632(a)	Water Supply Reliability . . .		
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	Water Supply Reliability . . .		
37	(Identify) 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.	10632(c)	Water Supply Reliability . . .		

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
38	(Identify) 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.	10632(d)	Water Supply Reliability . . .		
39	(Specify) 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.	10632(e)	Water Supply Reliability . . .		
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Water Supply Reliability . . .		
41	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.	10632(g)	Water Supply Reliability . . .		
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Water Supply Reliability . . .		
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Water Supply Reliability . . .		
44	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	10633	System Supplies		
45	(Describe) 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.	10633(a)	System Supplies		
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	System Supplies		

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	System Supplies		
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	System Supplies		
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	System Supplies		
50	(Describe the) 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.	10633(f)	System Supplies		
51	(Provide 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.	10633(g)	System Supplies		
52	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.	10634	Water Supply Reliability . . .	For years 2010, 2015, 2020, 2025, and 2030	

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
53	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.	10635(a)	Water Supply Reliability . . .		
54	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.	10635(b)	Plan Preparation		
55	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.	10642	Plan Preparation		
56	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.	10642	Plan Preparation		
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation		
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	Plan Preparation		

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
59	An urban water supplier shall submit to the department, the California State Library, 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 submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.	10644(a)	Plan Preparation		
60	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.	10645	Plan Preparation		

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.



# Chapter 1.0 INTRODUCTION

## 1.1 PURPOSE

This volume presents the Urban Water Management Plan 2010 (Plan) for the Western Municipal Water District (Western) service area, which includes both a retail and a wholesale area. This chapter describes the general purpose of the Plan, discusses Plan implementation, and provides general information about Western, retail purveyors, and service area characteristics.

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Plan as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- ▼ What are the potential sources of supply and what is the reasonable probable yield from them?
- ▼ What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- ▼ How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these “framework” questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- ▼ Accomplishes water supply planning over a 20-year period in five year increments. (Western is going beyond the requirements of the Act by developing a plan which spans 25 years.)
- ▼ Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.
- ▼ Implements conservation and efficient use of urban water supplies.

A checklist to document compliance of this Plan with the Act requirements is provided in the Executive Summary.

In short, the Plan answers the question: *Will there be enough water for the area served by Western Municipal Water District in future years, and what mix of programs should be explored for making this water available?*

It is the stated goal of Western to deliver a reliable and high quality water supply for customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years, in combination with conservation of non-essential demand during certain dry years, the Plan successfully helps Western achieve this goal.

## **1.2 OVERVIEW OF DOCUMENT**

This plan is organized as follows:

- Executive Summary
- Introduction
- Water Use
- Water Resources
- Recycled Water
- Reliability Planning
- Water Shortage Contingency Plan
- References
- Appendices

This Plan provides data for both the Western retail service area (those areas where Western delivers water directly to homes and businesses) and the Western wholesale service area (those areas where Western sells water to other water agencies). Specific demand and supply projections are provided for the Western retail area and more generalized information is provided for the wholesale area.

## **1.3 IMPLEMENTATION OF THE PLAN**

This Plan has been prepared specifically to evaluate demands on, and supplies of Western. Other water agencies that receive water from Western are responsible for their own water resources planning. However, this plan will guide Western actions, both to serve its retail areas and its wholesale customers.

### **1.3.1 Preparation of the Plan/Coordination**

Western encouraged participation in this plan by member agencies, land use agencies, and entities with common water sources. Water resource specialists with expertise in water resource

management were retained to assist the local water agencies in preparing the details of the Plan. Agency coordination for this Plan is summarized in Table 1-1.

**Table 1-1  
Agency Coordination Summary**

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Not Involved
Metropolitan Water District of Southern California					X	X	
Box Springs Mutual Water Company					X	X	
City of Corona	X		X	X	X	X	
City of Lake Elsinore					X	X	
City of Murrieta					X	X	
City of Norco					X	X	
City of Riverside				X	X	X	
City of Temecula					X	X	
Eagle Valley Mutual Water Company	X				X	X	
Elsinore Valley Municipal Water District	X			X	X	X	
Home Garden Mutual Water Company					X	X	
Jurupa Community Services District	X			X	X	X	
Lee Lake Mutual Water Company				X	X	X	
Rancho California Water District	X			X	X	X	
County of Riverside						X	
Riverside Highlands Water Company	X			X	X	X	
Rubidoux Community Services District				X	X	X	
Santa Ana River Water Company				X		X	

### 1.3.2 Public Outreach

The public outreach process for the UWMP started with a kickoff meeting describing the UWMP process and soliciting input from Western's wholesale customers and land use entities. A website specific to the UWMP update was developed to facilitate communication with stakeholders. In November 2010 Western solicited demand projections from the wholesale customers. In December 2010 Western held a meeting to go over the proposed methodology for developing future demands and the preliminary results of the UWMP. A Draft UWMP was made available for public review on June 1, 2011 and a joint hearing on the Plan and the SBX7-7 Implementation Plan was held prior to plan adoption by the Western Board of Directors.

Table 1-2 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, newsletter, website postings, and invitation letters are provided in Appendix A.

**Table 1-2  
Public Participation Timeline**

February 11, 2010	Notice to Land Use Entities and Wholesale Agencies	Notice of Western's intent to update its 2005 UWMP
March 15, 2010	Public Meeting	Kick-off Meeting to describe UWMP requirements and process
November 16, 2010	Request for water demand projections	Email soliciting water demand projection information for Western's wholesale customers. Phone calls were made to follow up on any missing wholesale customer data.
December 2, 2010	Public Meeting	Meeting to go over preliminary results of the UWMP and modeling tools used in the UWMP
June 1, 2011	Draft UWMP	Document made available for public review
May 31, 2011 and June 7, 2011	Notice of Public Hearing	Notice of availability of Draft UWMP, solicitation of input to Draft UWMP, and notice of Public Hearing
June 15, 2011	Public Hearing	Review contents of Draft UWMP and SBX7-7 Implementation Plan and take comments.
June 15, 2011	Plan Adoption	Review and adoption of the UWMP and SBX7-7 Implementation Plan by the Western Board of Directors
July 14, 2011	Plan Submittal	Submittal of Plan to the Department of Water Resources, Western wholesale customers, land use jurisdictions in the Western service area, and the California State Library

### 1.3.3 Document Availability

Following adoption, the Plan will be available during normal business hours at Western headquarters:

14205 Meridian Parkway, Riverside, CA, 92518

## 1.4 WESTERN MUNICIPAL WATER DISTRICT AND LOCAL AREA WATER PURVEYORS

### 1.4.1 Western Municipal Water District

Western was formed by the voters in 1954 to bring supplemental water to growing western Riverside County. There are 13 water purveyors in the Western service area; currently Western serves nine local area water purveyors with water from both the Colorado River, the State Water Project (SWP), as well as water from groundwater desalters. In addition, Western serves water

directly to approximately 23,000 domestic and 130 irrigation connections in its retail service area, which is located in the unincorporated areas around Lake Mathews, the City of Murrieta, and unincorporated Riverside County south of the City of Temecula.

Western is a member of the Metropolitan Water District of Southern California (Metropolitan). Water purveyors in the Western service area are listed below:

*Agencies within the Western service area currently receiving water from Western:*

- Box Springs Mutual Water Company
- City of Corona
- City of Norco
- City of Riverside
- Eagle Valley Mutual Water Company
- Elsinore Valley Municipal Water District (EVMWD)
- Lee Lake Water District
- Rancho California Water District (RCWD)
- Jurupa Community Services District (JCSD) (includes Santa Ana River Water Company). JCSD receives water through Corona and Norco and does not purchase water directly from Western.

*Agencies within the Western service area not currently receiving water from Western:*

- Home Gardens County Water District
- Riverside Highlands Water Company
- Rubidoux Community Services District
- Santa Ana Water Company

Figure 1 illustrates Western's service area and the 13 water purveyors within the wholesale area; Figure 2 illustrates Western's retail water service areas. Western's general district (wholesale and retail areas combined) consists of a 527 square mile area of western Riverside County and an estimated population of more than 860,000 people.

About sixty percent of the water Western sells is treated; the balance is untreated or raw water. About one-third of Western's water sales are for domestic purposes; the rest wholesale. Water sold for agricultural purposes is used to irrigate crops such as citrus and avocados, and commercial nurseries. Agricultural water use in the retail area has decreased in past years with increasing urbanization. About one-quarter of the water Western purchases from Metropolitan comes from the Colorado River Aqueduct and about three-quarters from the State Water Project, which transports water from Northern California via the California Aqueduct. Western also has

significant groundwater resources in local groundwater basins. Major water infrastructure in the Western service area is depicted in Figure 1-3.

### 1.4.2 Western Retail Area

Western's retail areas (see Figure 1-2) cover about 73 square miles and serves water to an estimated population of 85,500. Western's retail service area includes the Riverside service area which includes a portion of the City of Riverside and unincorporated portions of Riverside County, including the areas known as Lake Mathews, Gavilan Hills, Woodcrest, Orange Crest, Mission Grove, Victoria Grove, and Lake Hills.

In 2005, Western took ownership of the Murrieta County Water District as a separate retail service area, now called the Murrieta Division. The entire Murrieta Division area lies within the City of Murrieta and is approximately 6.5 square miles in size. Western also serves a very small area, called the Rainbow service area, in an area just south of the City of Temecula in the unincorporated portion of Riverside County.

### Population

Western's retail service areas have a combined current population of approximately 85,469 persons. Western has prepared an estimate of future population for 2015 to 2035, based on evaluation of land uses and potential growth. Growth is assumed to occur on vacant or agricultural land. Growth is projected linearly to an ultimate build-out year of 2040. This is based on build-out information from the 2003 Riverside County General Plan, as well as from California Department of Finance growth projections which show linear growth for Riverside County. In the 2003 General Plan, Riverside County estimated that buildout would occur in year 2040. Western recognizes that given the current economic downturn growth is currently slow, but for planning purposes is using a long-term growth rate. Population projections are shown in Table 1-3 below.

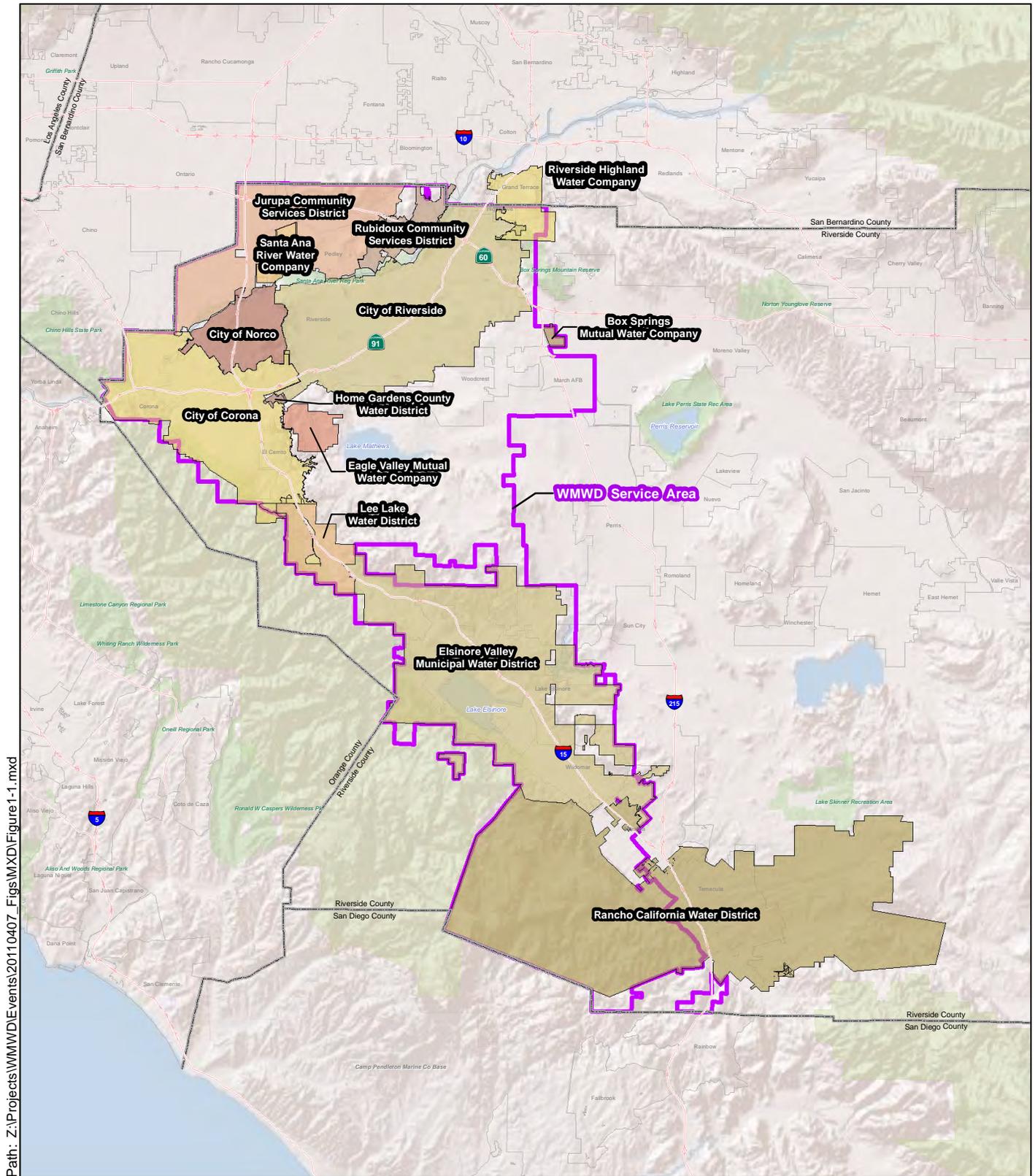
**Table 1-3  
Current and Projected Population in Western Retail Areas**

<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
85,469	98,812	112,157	126,524	142,732	161,016	181,643

Between 1995 and 2000, population growth in Western's retail service averaged 3.5% annually. Between 2001 and 2005, growth averaged 2.5% annually, and between 2006 and 2009, growth averaged 1.1% annually. Western, like Riverside County overall, has experienced the impacts of economic downturn after years of steady growth. The Western retail and wholesale areas still have great growth potential.

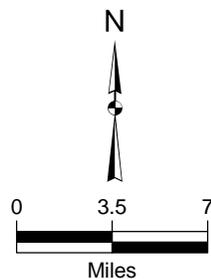
### Climate

Western is located in the "Inland Empire" approximately 50 miles east of Los Angeles, where the warm dry climate is generally considered Mediterranean in characteristic. The climate



Path: Z:\Projects\WMWDEvents\20110407\_Figs\MXD\Figure1-1.mxd

Source: © 2009 ESRI; (c)2009 Microsoft Corporation



**Kennedy/Jenks Consultants**

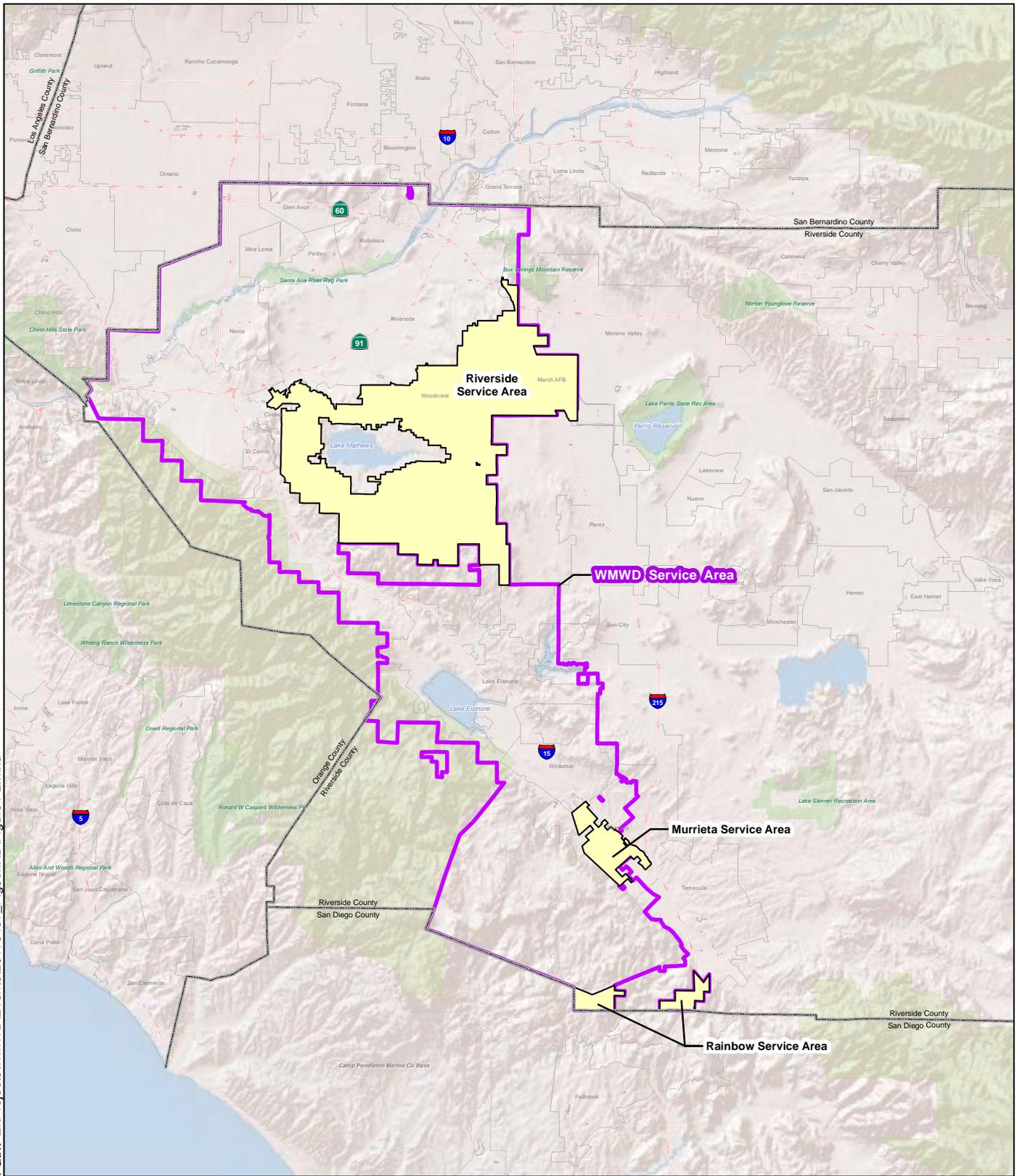
Western Municipal Water District  
Riverside County, California

**Western Municipal Water District  
Member Agencies**

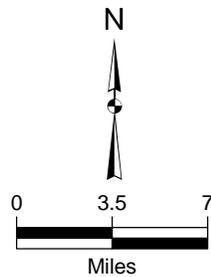
K/J 1089006\*00  
May 2011

**Figure 1-1**

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Source: © 2009 ESRI; (c)2009 Microsoft Corporation



**Kennedy/Jenks Consultants**

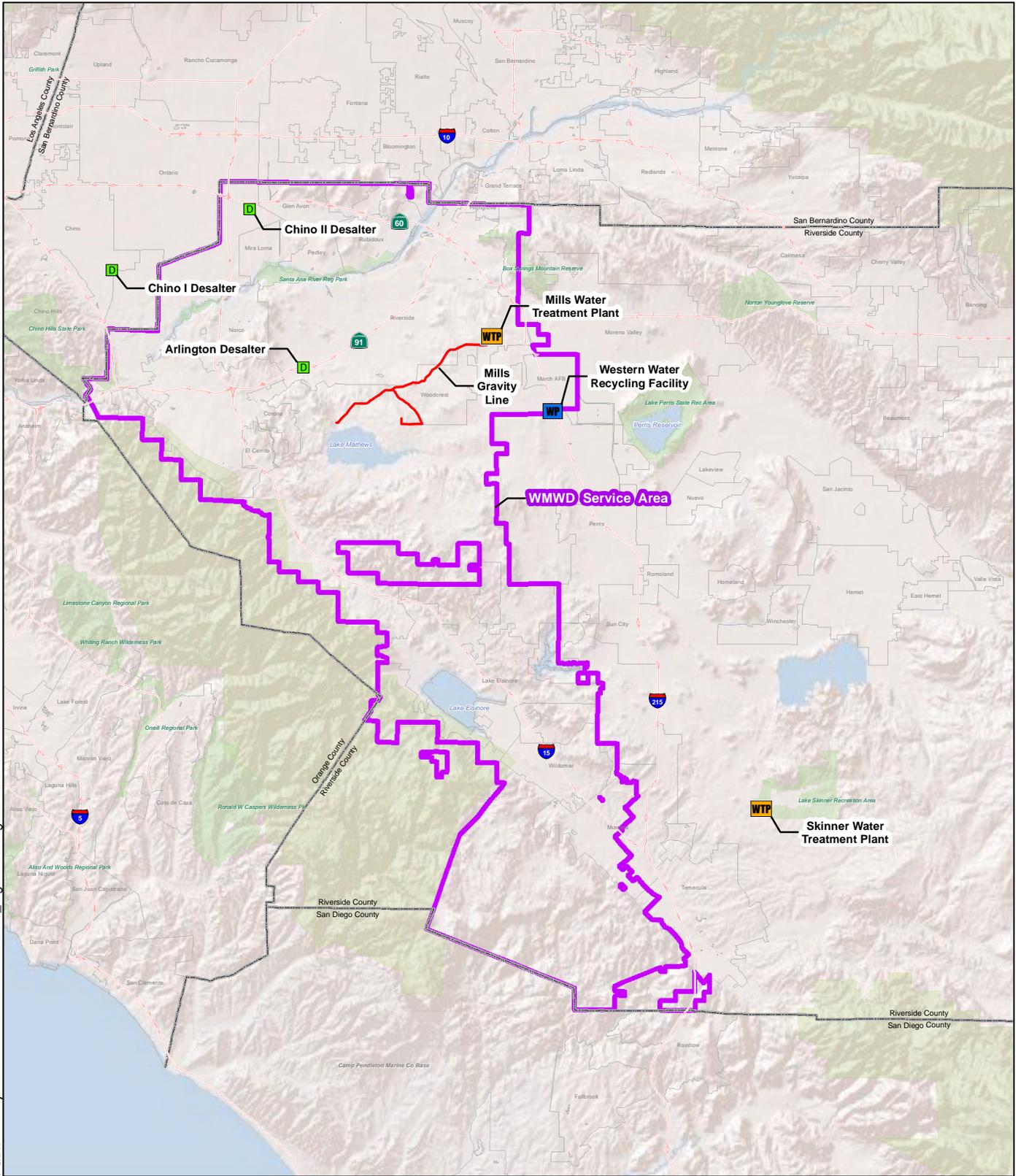
Western Municipal Water District  
Riverside County, California

**Western Municipal Water District  
Retail Service Areas**

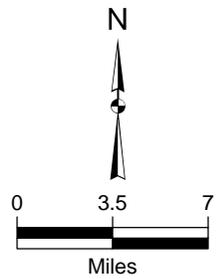
K/J 108906\*00  
May 2011

**Figure 1-2**

Path: Z:\Projects\WMWDEvents\20110407\_Figs\MXD\Figure1-3.mxd



Source: © 2009 ESRI; (c)2009 Microsoft Corporation



**Kennedy/Jenks Consultants**  
Western Municipal Water District  
Riverside County, California

**Major Water Infrastructure**

K/J 1089006\*00  
May 2011

**Figure 1-3**



typically exhibits hot, dry summers and mild, wet winters. Annual precipitation totals vary substantially from year to year. Most rainfall occurs during the months of November through April. Onshore airflow occurs during most of the year producing southwesterly winds. “Santa Ana” conditions occur occasionally producing warm, dry, northeast winds that can reach high velocities. Table 1-4 provides information on evapotranspiration (ET<sub>o</sub>), average rainfall, and average temperature for Western’s three retail service areas.

**Table 1-4  
Climate in the Western Retail Service Areas**

	Jan	Feb	Mar	Apr	May	Jun
<b>Riverside Retail Area</b>						
Standard Monthly Average ET <sub>o</sub>	2.49	2.91	4.16	5.27	5.94	6.56
Average Rainfall (°F)	2.03	2.2	1.85	0.77	0.23	0.05
Average Temperature	52.9	54.7	57.2	61.1	65.6	70.9
<b>Murrieta</b>						
Standard Monthly Average ET <sub>o</sub>	2.74	2.71	3.79	4.79	5.48	6.18
Average Rainfall (°F)	2.51	2.55	2.03	0.74	0.23	0.02
Average Temperature	50.8	53.1	56.1	60.4	65.8	72.3
<b>Rainbow</b>						
Standard Monthly Average ET <sub>o</sub>	2.74	2.71	3.79	4.79	5.48	6.18
Average Rainfall (°F)	2.51	2.55	2.03	0.74	0.23	0.02
Average Temperature	50.8	53.1	56.1	60.4	65.8	72.3

	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Riverside Retail Area</b>							
Standard Monthly Average ET <sub>o</sub>	7.22	6.92	5.35	4.05	2.94	2.56	
Average Rainfall (°F)	0.04	0.13	0.19	0.44	0.84	1.47	10.24
Average Temperature	76.8	77.0	73.5	66.4	58.7	53.5	64.0
<b>Murrieta</b>							
Standard Monthly Average ET <sub>o</sub>	6.79	6.75	5.29	4.18	3.41	2.87	
Average Rainfall (°F)	0.07	0.13	0.26	0.51	0.99	2.02	12.06
Average Temperature	78.7	78.9	74.5	66.2	57.5	51.7	63.8
<b>Rainbow</b>							
Standard Monthly Average ET <sub>o</sub>	6.79	6.75	5.29	4.18	3.41	2.87	
Average Rainfall (°F)	0.07	0.13	0.26	0.51	0.99	2.02	12.06
Average Temperature	78.7	78.9	74.5	66.2	57.5	51.7	63.8
Evapotranspiration (ET <sub>o</sub> ), rainfall, and temperature data for Riverside from station at University of Riverside Station #44, for Murrieta and Rainbow from Temecula Station #62 as provided on the CIMIS website database at <a href="http://www.cimis.water.ca.gov">www.cimis.water.ca.gov</a> .							
Rainfall and Temperature data from NOAA’s Western Regional Climate Center, <a href="http://www.wrcc.dri.edu">www.wrcc.dri.edu</a> . Riverside data from Riverside Fire Station 3 Station. Murrieta and Rainbow data from Elsinore, CA Station.							

### **1.4.3 Western Local Water Purveyor Customers**

As described earlier, nine water purveyors are served both treated and raw water by Western using Colorado River and SWP supplies transported by Metropolitan, and treated water from the Arlington Desalter. In addition to water purchased from Western, most of these water purveyors also pump and deliver local groundwater and/or recycled water within their respective service areas.

#### **Box Springs Mutual Water Company**

Box Springs Mutual Water Company (BSMWC) has approximately 585 service connections in a 430-acre service area. BSMWC currently receives water from one BSMWC-owned well located in the Riverside South Groundwater Basin. BSMWC is connected to Western's distribution system. Water is purchased from Western for blending purposes. In 2005 purchases from Western totaled approximately 86 AF and in 2010 totaled 87 AF.

#### **City of Corona**

The City of Corona's Department of Water and Power serves approximately 150,000 customers in a 39-square-mile service area both inside the city limits and in unincorporated Riverside County. Corona receives approximately 45 percent of its total water supply as imported water from Western. Its local sources include the Bedford, Coldwater, and Temescal Groundwater Basins. In 2009, Corona purchased 17,400 AF from Western.

#### **City of Norco**

The City of Norco serves approximately 26,000 customers in a 15.5-square-mile service area. Norco currently receives groundwater from both the Chino Groundwater Basin and the Arlington Desalter and purchases imported water through a connection with the City of Corona. Since 2005, the City of Norco has received about 73% of its supply from Western. In 2009, Norco purchased 6,600 AF of Western supplies.

#### **City of Riverside**

The City of Riverside (Riverside) provides water through approximately 63,500 water service connections within a service area of 75 square miles, of which approximately 69 square miles are within the City limits. Approximately 9 square miles within the City limits are served by Western and 1 square mile within the City of Riverside limits are served by Eastern Municipal Water District. A small area (1/4 square mile) in northeast Riverside is served by RHWC.

Riverside gets the majority of its water from groundwater extractions from the San Bernardino Basin Area and the Riverside Groundwater Basin. Since 2005, Riverside has received less than 5% of its supply from Western. In 2009, Riverside purchased less than 5 AF of water from Western.

#### **Eagle Valley Mutual Water Company**

Eagle Valley Mutual Water Company was established in the late 1950s as a privately owned mutual water company to serve non-potable irrigation water to an agricultural area of approximately 3,070 acres in Eagle Valley, west of Lake Mathews. It is anticipated that as long as its service area has agricultural lands, the water company will continue to be a viable

operating agency. Eagle Valley has no groundwater pumping at this time. Eagle Valley purchased 652 AF of water from Western in 2009.

### **Elsinore Valley Municipal Water District**

Elsinore Valley Municipal Water District (EVMWD) serves approximately 40,000 customers in a 96-square-mile service area in the Lake Elsinore area. EVMWD's water supply is a blend of local groundwater, surface water from Canyon Lake, and imported water. EVMWD owns Canyon Lake, which impounds local runoff from the 750-square-mile San Jacinto River watershed. Canyon Lake holds nearly 12,000 AF of water behind Railroad Canyon Dam. EVMWD imports treated water from Metropolitan's Skinner Water Treatment Plant (WTP) and Mills WTP, located in Temecula and Riverside, respectively. The treatment facilities are operated by Metropolitan. Since 2005, approximately 61% of EVMWD's supply has been imported. In 2009, EVMWD, purchased 16,500 AF from Western.

### **Lee Lake Water District**

Lee Lake Water District has approximately 2,000 service connections in a service area of approximately 450 acres. Although Lee Lake Water District encompasses approximately 6,755 acres, the Lee Lake Water District distribution system only serves 450 acres. The main portion of Lee Lake Water District is served imported water from Western. Areas currently being served imported water consist of residential development in Wildrose, which is now built out, commercial parcels in the Wildrose East Business Park along Temescal Canyon Road, and residential development in the first construction phases of the Trilogy development. Other portions within the Lee Lake Water District boundary are either undeveloped, supplied from wells, or supplied from the City of Corona or the EVMWD. Lee Lake Water District purchased about 3,100 AF from Western in 2009.

### **Rancho California Water District**

Rancho California Water District (RCWD) serves approximately 100,000 customers and encompasses almost 100,000 acres in the Temecula area. RCWD is divided into Rancho Division and the Santa Rosa Division. The Santa Rosa Division is the portion of RCWD within Western. RCWD delivers a combination of local groundwater, recycled water, and imported water from Metropolitan to meet domestic, industrial, and agricultural demands. In 2009, Western delivered approximately 22,000 AF to RCWD.

### **Jurupa Community Services District**

The Jurupa Community Services District (JCSD) serves approximately 91,000 customers in a 42-square-mile service area in the northwest corner of Riverside County. JCSD does not currently receive imported water from Western, but JCSD is in the planning stages of developing supply and conveyance to augment existing water supplies with imported water.

#### **1.4.4 Other Agencies in the Western Service Area**

There are several agencies in the Western service area that do not currently purchase water from Western. These agencies are briefly described below.

### **Home Gardens County Water District**

Home Gardens County Water District was established in 1979 as a county water district. With its formation, it acquired the assets and facilities of the Home Gardens Mutual Water Company. Home Gardens County Water District serves an area of more than 230 acres in the Riverside County area east of Temescal Street and South of Sampson Avenue. It has approximately 800 metered services for a population of approximately 3,000 people. Initially, Home Gardens County Water District served its customers with local groundwater from wells in the Arlington Basin. Because of the basin's poor water quality, Home Gardens County Water District has discontinued much of its well supply, currently receiving approximately two-thirds of its water from the City of Riverside.

### **Riverside Highlands Water Company**

RHWC provides domestic and irrigation water services to the City of Grand Terrace, portions of the City of Colton, and portions of the unincorporated areas of the Counties of San Bernardino and Riverside. It serves approximately 12,000 persons in a service area of approximately 5,500 acres. The total supply for the water company originates from groundwater wells located in the Riverside North and South Basins and the Bunker Hill Basin.

### **Rubidoux Community Services District**

Rubidoux Community Services District serves approximately 27,000 customers in a 120-acre service area. All of Rubidoux CSD's potable water supply is obtained from extraction wells located within Rubidoux CSD boundaries, except for emergency water supplies delivered through interconnections with JCSD and West Valley Water District. Rubidoux CSD's wells extract water from the portion of the Riverside Basin lying within Riverside County. In 2009 Rubidoux pumped and delivered approximately 6,600 AF to its customers.

### **Santa Ana Water Company**

The Santa Ana Water Company was established in 1925 and is a privately held, independently operated mutual water company. The Santa Ana Water Company serves an area surrounded by Jurupa Community Services District in unincorporated Riverside County. Santa Ana Water Company utilizes water from the Chino Basin Desalter Authority, water leases with Jurupa Community Services District and local groundwater.

## **1.5 RESOURCE MAXIMIZATION**

As documented in Chapters 2 and 3, Western has demonstrated a long-term commitment to resource maximization. For many years, Western, in coordination with other local agencies, has undertaken studies as well as actions to maximize the use of available resources. Studies and documents include the 2008 Integrated Regional Water Management Plan and the 2008 Water Use Efficiency Master Plan. More importantly, Western has taken action to better utilize available resources, including:

- Implementation of conservation programs. Western is a signatory to the California Urban Water Conservation Council Memorandum of Understanding Regarding Urban Water Conservation in California and has implemented water conservation strategies both in its retail and wholesale areas (see section 2.6).

- Pursuit of local Santa Ana River water supplies. Western, along with San Bernardino Valley Municipal Water District, jointly filed two applications with the State Water Resources Control Board to appropriate water from the Santa Ana River, made available through the construction of Seven Oaks Dam. A permit to begin diversion of Santa Ana River water was issued by the State Water Resources Control Board in July 2010 (see section 3.6.4)
- Joining the Chino Desalter Authority. Western recently became a member of the Chino Desalter Authority (CDA). The CDA is a collaborative effort among its members and dozens of municipalities and water users in the Chino Basin with the goal of maintaining water yield and water quality.
- Cooperating in the construction of facilities to treat and utilize local Chino Basin Groundwater supplies. In its role as a CDA member Western is participating in the construction of multiple facilities that will expand the ability to treat, convey, and deliver otherwise unusable water from the Chino Basin area.



# Chapter 2.0 WATER USE

## 2.1 OVERVIEW

This chapter describes historic and current water usage and the methodology used to project future demands. A description of historic and current water use for both the wholesale and the retail service area is provided.

## 2.2 HISTORICAL WATER USE

Western meters all accounts and tracks retail water usage by customer type including residential, commercial, industrial, institutional, and agricultural accounts. Tracking is done by user code and reports can be generated to determine the number of accounts and quantities. Municipal and industrial domestic water demands within the retail area has been steadily increasing since 1995 while agricultural demand has seen a steady drop. Overall total water demand has been increasing since 1995, with demands nearly tripling between 1995 and 2010. Figure 2-1 shows the historical water demands within Western’s retail service area. Figure 2-2 shows historical wholesale demands.

Figure 2-1: Historical Retail Area Demands

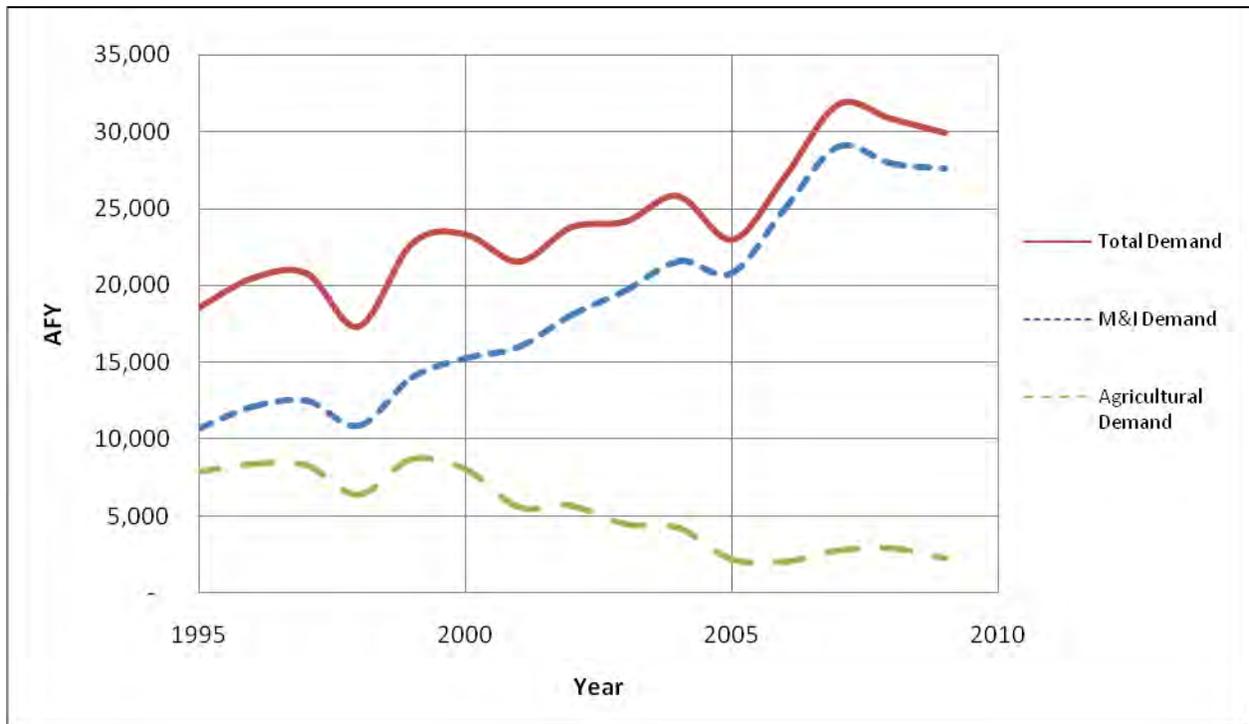
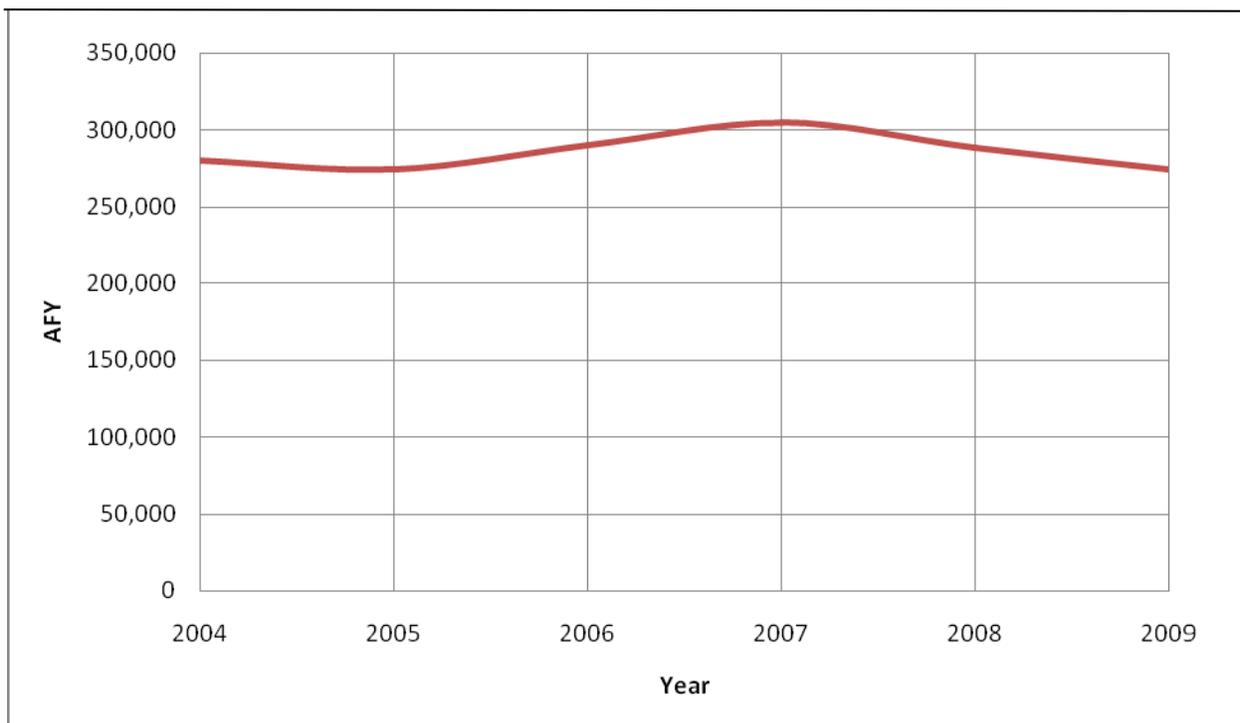


Figure 2-2: Historical Wholesale Area Demands



Western also provides wholesale water to various water purveyors within the District boundaries. Table 2-2 shows the historic deliveries to each of these agencies. These deliveries include both domestic and non-domestic water supplies. In addition to sales to its member agencies, Western did make some minor sales to MWD, as shown in Table 2-2.

In the past, Western has not had water use related to saline barriers, groundwater recharge operations, or recycled water. However, Western, like many water agencies, does have some unaccounted-for water. Unaccounted-for water is the difference between the amount of water produced and the amount of water billed to customers. Sources of unaccounted-for water include:

- Hydrant testing and flushing
- Water used for fire fighting
- Customer meter inaccuracies - Customer meters represent one of the main sources of unaccounted-for water as they tend to under-represent actual consumption in the water system
- Reservoir overflows - This represents unrecorded water use when reservoirs overflow
- Leaks from water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as

they are very small; however these small leaks contribute to the overall unaccounted-for water.

Table 2-3 summarizes what the California Department of Water Resources refers to as “other” water uses, besides metered deliveries and sales to other agencies.

**Table 2-1  
Historical Deliveries to Western Retail Area**

	2005		2010	
	# of Accounts	Deliveries (AF)	# of Accounts	Deliveries (AF)
Deliveries to Riverside Retail Area				
Single-Family	17,272	16,339	19,152	15,114
Multi-Family	16	1	6	377
Commercial/Industrial	386	2,570	426	1,979
Institutional/Governmental	40	325	28	208
Landscape	359	1,351	416	3,212
Agricultural	154	2,017	106	1,832
<b>Riverside Area Subtotal</b>	<b>18,227</b>	<b>22,603</b>	<b>20,134</b>	<b>22,722</b>
Deliveries to Murrieta Retail Area	*	*		
Single-Family	*	*	2,257	1,343
Multi-Family	*	*	19	144
Commercial/ Industrial/ Institutional	*	*	2	201
Landscape	*	*	118	305
Agricultural	*	*		
<b>Murrieta Area Subtotal</b>	<b>0</b>	<b>0</b>	<b>2,396</b>	<b>1,993</b>
Deliveries to Rainbow Retail Area				
Single-Family	27	17	34	16
Multi-Family	0	0	0	0
Commercial/ Industrial/ Institutional	6	8	6	10
Landscape	2	27	2	0
Agricultural				
<b>Rainbow Area Subtotal</b>	<b>35</b>	<b>52</b>	<b>42</b>	<b>26</b>
<b>Total Retail Area</b>	<b>18,262</b>	<b>22,655</b>	<b>22,572</b>	<b>24,741</b>
Note: Customer classifications differed slightly between 2005 and 2010 due to billing system changes in mid-2009.				
* The Murrieta Retail area did not become a part of the Western retail area until November 2005, when the Murrieta County Water District was consolidated with Western Municipal Water District as a result of action taken by the Local Agency Formation Commission.				

**Table 2-2  
Historical Sales**

	<b>2005</b>	<b>2010</b>
	<i>Deliveries (AF)</i>	<i>Deliveries (AF)</i>
<b>Deliveries to Western Member Agencies</b>		
Box Springs Mutual Water Company	86	87
City of Corona	17,668	14,589
City of Norco	6,572	6,104
City of Riverside	3,986	0
Eagle Valley Mutual	955	389
Elsinore Valley Municipal Water District	15,079	17,733
Lee Lake Water District	3,188	2,750
Rancho California Water District	20,415	17,260
<i>Total Deliveries to Member Agencies</i>	<i>67,949</i>	<i>58,912</i>
Sales to Metropolitan Water District	6	2
<b>Total Sales</b>	<b>67,955</b>	<b>58,914</b>
Notes: All deliveries are imported MWD supply except for 5,016 AF delivered to Norco from the Arlington Desalter in 2005 and 5,429 AF delivered to Norco from the Arlington Desalter in 2009.		

**Table 2-3  
Historical "Other" Water Uses (AF)**

	<b>2005</b>	<b>2010</b>
Groundwater Recharge	0	0
Saline Barriers	0	0
Recycled Water	0	0
System Losses	3,172	1,979
Source: Personal Communication Western Municipal Water District.		

Table 2-4 below presents information on all historic water uses for the years 2005 and 2010.

**Table 2-4  
Historic Total Water Use (AF)**

<b>Water Use</b>	<b>2005</b>	<b>2010</b>
Deliveries to Western Retail (from Table 2-1)	22,655	24,741
Sales (from Table 2-2)	67,955	58,914
"Other" Water Uses (from Table 2-3)	3,172	1,979
<i>Total</i>	<i>93,782</i>	<i>85,634</i>

## 2.3 EXISTING AND TARGETED PER CAPITA WATER USE IN WESTERN RETAIL AREA

The Water Conservation Bill of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the *20 by 2020 Water Conservation Plan*. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish future water use targets in gallons per capita per day (GPCD); reporting is to begin with the 2010 UWMP.

### 2.3.1 Base Daily Per Capita Water Use in Western Retail Area

The two primary calculations required by SBX7-7 are:

- Base Daily Water Use calculation (average GPCD used in past years)
- Compliance Water Use Target (target gallons per capita per day in 2015 and 2020)

The Base Daily Water Use calculation is based on gross water use by a retail agency in each year and can be based on a ten-year average ending no earlier than 2004 and no later than 2010 or a 15-year average if ten percent of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage

An urban retail water supplier must set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's baseline per capita daily water use
2. Per capita daily water use estimated using the sum of the following:
  - a. For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20 percent reduction target, this standard may be adjusted by the Legislature by statute.
  - b. For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992.
  - c. For commercial, industrial, and institutional (CII) uses, a ten percent reduction in water use from the baseline CII water use by 2020.

3. Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft *20 by 2020 Water Conservation Plan*. Western falls within the South Coast Hydrologic Region; the region target is 142 GPCD. The South Coast region encompasses several coastal counties (Ventura, Los Angeles, Orange, and San Diego) and also includes portions of inland counties such as San Bernardino and Riverside. This target is more appropriate for coastal, rather than inland, areas.
4. Reduce the 10 or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
  - a. Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "Best Management Practices Calculator".
  - b. A 20 percent savings on all unmetered uses.
  - c. A 10 percent savings on baseline CII use.
  - d. A 21.6 percent savings on current landscape and water loss uses.

The Interim Water Use Target is set as a halfway point between the Base Daily Water Use GPCD and the 2020 Compliance Water Use Target GPCD.

Finally, the selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable GPCD". The Maximum Allowable GPCD is based on 95% of a 5-year average base gross water use ending no earlier than 2003 and no later than 2010. The Maximum Allowable GPCD is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction of the SBX7-7 legislation. If an agency's Compliance Water Use Target is higher than the Maximum Allowable GPCD, the agency must instead use the Maximum Allowable GPCD as their target.

### **Base Daily Per Capita Water Use**

Tables 2-5 through 2-7 summarize the Base Daily Water Use calculation for Western. The period 1995 to 2004 has been selected for calculation of the 10-year base period while years 2003 to 2007 have been selected for calculation of the 5-year base period. The 10-year average Base Daily Per Capita Water Use for Western is 432 GPCD; the 5-year average is 378 GPCD. Western has excluded recycled water from the calculations of base daily per capita water use but has chosen to include water delivered to agricultural customers.

**Table 2-5  
Base Period Ranges**

<b>Base</b>	<b>Parameter</b>	<b>Value</b>
<b>10- to 15- Year Base Period</b>	2008 Total Water Deliveries (AF)	31,300
	2008 Total Volume of Delivered Recycled Water (AF)	749
	2008 Recycled Water as a Percent of Total Deliveries (%)	2%
	Allowable Base Period (years) <sup>1</sup>	10
	Year Beginning Base Period Range	1995
	Year Ending Base Period Range <sup>2</sup>	2004
<b>5-Year Base Period</b>	Year Beginning Base Period Range	2003
	Year ending Base Period Range <sup>3</sup>	2007
<p><sup>1</sup> If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.</p> <p><sup>2</sup> The ending year must be between December 31, 2004 and December 31, 2010.</p> <p><sup>3</sup> The ending year must be between December 31, 2007 and December 31, 2010.</p>		

**Table 2-6  
Base Daily Per Capita Water Use, Selected 10-Year Period**

<b>Sequence Year</b>	<b>Calendar Year</b>	<b>Distribution System Population<sup>1</sup></b>	<b>Daily System Gross Water Use (MGD)</b>	<b>Annual Daily Per Capita Water Use (GPCD)</b>
1	1995	40,327	17	429
2	1996	41,400	19	460
3	1997	42,474	19	455
4	1998	43,547	16	369
5	1999	44,621	21	473
6	2000	45,694	22	474
7	2001	48,661	20	412
8	2002	51,628	22	428
9	2003	54,594	22	411
10	2004	57,561	23	408
<i>Base Daily Per Capita Water Use, 10-Year Average</i>				432
<p><sup>1</sup> Western's service area population estimated using 1990, 2000 and 2010 Census data for tracts in Western's retail areas with intervening years extrapolated.</p>				

Table 2-7 below provides the data on the Maximum Allowable GPCD. The Maximum Allowable GPCD is based on 95% of the 5-year average base gross water use. In this case 95% of the 5-year GPCD is 359 GPCD.

**Table 2-7  
Base Daily Per Capita Water Use, 5-Year**

Sequence Year	Calendar Year	Distribution System Population <sup>1</sup>	Daily System Gross Water Use (MGD)	Annual Daily Per Capita Water Use (GPCD)
1	2003	54,594	22	411
2	2004	57,561	23	408
3	2005	60,528	21	345
4	2006	71,700	24	341
5	2007	75,401	29	383
<i>Base Daily Per Capita Water Use, 5-Year Average</i>				<i>378</i>
<sup>1</sup> Western's service area population estimated using year 2000 and 2010 Census data for tracts in Western's retail areas with intervening years extrapolated.				

In order to calculate Base Daily Per Capita Water Use for past years, it was necessary to develop population estimates for past years. GIS was used to identify Census Tracts in the Western Lake Mathew and Rainbow retail areas and population for years 1990, 2000 and 2010 was developed. Intervening years were extrapolated. A similar methodology was applied for the Murrieta retail area, except the overall population for Murrieta was only included in the overall retail service area estimates for years 2006 onward (Murrieta became part of the Western system in November 2005).

### 2.3.2 Compliance Water Use Targets

In addition to calculating base gross water use, SBX7-7 requires that a retail water supplier identify its demand reduction targets. The methodologies for calculating demand reduction targets were described above. Western has selected Method 4 to calculate its 2020 Compliance Water Use Target and Interim Water Use Target.

Compliance Water Use Target under Method 4 is Base Daily GPCD less:

- Indoor residential water savings of 15 GPCD or an amount determined by use of DWR's "Best Management Plan Calculator".
- 20 percent savings on all unmetered uses
- 10 percent savings on Baseline CII (expressed in GPCD)
- 21.6 percent savings on current landscape and water loss uses (expressed as GPCD)

Western is choosing to use the default value of 15 GPCD for the indoor residential water savings. The Western retail area has no unmetered uses. As shown in Table 2-8, baseline CII water use was estimated using the 10-year average of water sales to CII water uses in the Western service area for the years 1995 to 2004 (the same period as was used to calculate the Base Daily Per Capita Water Use). Baseline CII water use is 163 GPCD.

**Table 2-8  
Baseline Commercial, Industrial, and Institutional Water Use**

Sequence Year	Calendar Year	Distribution System Population <sup>1</sup>	CII Water Use (MG)	Annual Daily Per Capita Water Use (GPCD)
1	1995	40,327	3,047	207
2	1996	41,400	3,327	220
3	1997	42,474	3,075	198
4	1998	43,547	2,420	152
5	1999	44,621	3,232	198
6	2000	45,694	3,106	186
7	2001	48,661	2,279	128
8	2002	51,628	2,373	126
9	2003	54,594	2,123	107
10	2004	57,561	2,195	104
<i>Baseline CII Water Use (10-year Average)</i>				163
<sup>1</sup> Western's service area population estimated using year 2000 and 2010 Census data for tracts in Western's retail areas with intervening years extrapolated.				

DWR has provided the following formula for calculating landscape and water loss uses:

$$= \text{Base Daily Per Capita Water Use} - \text{Default Indoor Water Use (70 GPCD)} - \text{Baseline CII}$$

Based on this formula, Western's landscape and water loss use is:

$$= 432 \text{ GPCD} - 70 \text{ GPCD} - 163 \text{ GPCD} = 199 \text{ GPCD}$$

A 21.6 percent savings on landscape and water loss would be 43 GPCD.

The resulting Compliance Water Use Target is 358 GPCD, the full calculation is demonstrated in Table 2-9 below. The Interim Water Use Target (applicable in 2015) is 395 GPCD.

**Table 2-9  
Method 4 Compliance Water Use Target Calculation**

Baseline GPCD	432
<i>less</i> indoor residential water savings (GPCD)	-15
<i>less</i> 20 percent unmetered water uses (GPCD)	0
<i>less</i> 10 percent savings on CII water use (GPCD)	-16
<i>less</i> 21.6 percent savings on landscape and water loss uses (GPCD)	-43
<i>Compliance Water Use Target</i>	358
<i>Interim Water Use Target</i>	395

## **Confirmation of Water Use Targets**

As described earlier, the Maximum Allowable GPCD is 359. The Compliance Water Use Target, under Method 4 (358 GPCD) is less than the Maximum Allowable GPCD, so no adjustments to the Compliance Water Use Target are necessary.

The methods Western intends to use to meet the targets in compliance with SBX7-7 are described in section 2.6.

## **2.4 PROJECTED WATER USE**

Western has developed the Water Demand Forecast (WDF) Model as a tool to help project future water demands within the retail and wholesale service area. This tool is intended to be used for the 2010 UWMP as well as for other planning purposes into the future. The WDF is a GIS based application that uses general plan land use data to project water demands. Using the underlying land use information, the WDF takes user inputs on unit demands and growth rate assumptions to project demands from the year 2006 to buildout. The unit demands used in the WDF model were based on historical water use data for Western retail areas and Western member agencies and the results were calibrated to actual water demands.

The WDF Model results were used as the basis of water projections for Western's retail service area, and was offered as a tool to Western's member agencies during the public coordination process. However, a number of agencies preferred to develop their own demand projections, and their results have been incorporated herein. These agencies include:

- City of Corona
- EVMWD
- JCSD
- RCWD
- RHWC

Several agencies chose to use demand projections provided by the WDF Model:

- Box Springs Mutual Water Company
- Eagle Valley Mutual Water Company
- Lee Lake Water District
- City of Norco
- City of Riverside
- Rubidoux Community Services District

### **2.4.1 Water Demand Forecast Model**

The WDF Model is based on land uses as described in the 2003 Riverside County General Plan and city general plans available as of 2007. While more current general plan data was available at the time the 2010 UWMP was developed, a review of current city and unincorporated area general plans indicated that this data was not significantly different from that already incorporated into the WDF. In fact the estimated difference between the current WDF Model projected demands and estimated demand under updated city general plans is less than 5 percent.

The model is GIS based, and includes all Western member agencies, with water duty factors for each agency and each land use. Initial water duty factors were based on a sampling of accounts and a comparison of the number of accounts and metered water use for that type of account. The water duty factors were refined during model calibration. The model tracks land uses and water demands for the following categories:

- Single Family (less than 1 unit per acre)
- Single Family (1-5 units per acre)
- Single Family (6 or more units per acre)
- Multi Family (apartments, condos, mobile homes)
- Commercial (low, medium, and high density)
- School
- Vacant
- Agriculture

Growth is assumed to occur on vacant or agricultural land. Growth is projected linearly to an ultimate buildout year of 2040. This is based on build-out information from the 2003 Riverside County General Plan, as well as from California Department of Finance growth projections. In the 2003 General Plan, Riverside County estimated that buildout would occur in year 2040. This assumed western Riverside County would grow at approximately 3.38% annually (Riverside County 2003). Western recognizes that given the current economic downturn growth is currently slow, but for planning purposes is using a long-term growth rate.

The model can include a conservation factor, but for the purposes of this UWMP no conservation factor was applied. This choice was made so that demands both with and without conservation could be evaluated.

### **2.4.2 Projected Water Use - Western Retail Area**

Using the WDF Model, Western has estimated the following future demands for its retail area (see Table 2-10). Information is provided from 2015 to buildout and projections are provided both with and without additional conservation. In order to achieve SBX7-7 targets it is estimated that Western would need to reduce water use by 5% in its retail areas by year 2015 and by 10% by year 2020; these conservation estimates are included in Table 2-10.

**Table 2-10  
Project Water Use Western Retail Areas from WDF (AF)**

<b>Area</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
Riverside Retail Area	28,549	32,639	36,728	40,818	44,908	48,998
Residential	24,501	28,057	31,613	35,169	38,725	42,282
Commercial	2,491	3,280	4,070	4,859	5,648	6,438
Agricultural	1,557	1,301	1,046	790	534	278
Murrieta Retail Area	2,972	3,144	3,316	3,488	3,660	3,832
Residential	2,713	2,872	3,030	3,189	3,348	3,507
Commercial	145	181	217	253	289	325
Agricultural	114	91	69	46	23	0
Rainbow Retail Area	1,651	1,992	2,334	2,676	3,017	3,359
Residential	606	939	1,272	1,605	1,938	2,270
Commercial	449	574	699	824	948	1,073
Agricultural	595	479	363	247	132	16
<i>Total without additional conservation</i>	<i>33,172</i>	<i>37,775</i>	<i>42,379</i>	<i>46,982</i>	<i>51,585</i>	<i>56,189</i>
<i>Total with conservation (assumed to be 5% by year 2015 and 10% by year 2020)</i>	<i>31,513</i>	<i>33,998</i>	<i>38,141</i>	<i>42,284</i>	<i>46,427</i>	<i>50,570</i>

In addition to the demands projected by the WDF Model, Western has evaluated known potential developments. Developments that were considered consistent with land uses included in the WDF were excluded from further evaluation. Developments with greater growth potential than that considered by the WDF Model are documented in Table 2-11 below. It is assumed all water demand from these “other developments” could be realized by year 2015. Total anticipated demands in the service areas is provided in Table 2-12.

### **2.4.3 Projected Water Use - Wholesale Area**

Table 2-13 below provides information on water demand projections in Western’s wholesale area. Most of the water purveyors in the Western service area utilize local sources (groundwater, recycled water, and a minor amount of surface water) along with imported water and desalter water purchased from Western to meet water demands. Table 2-13 gives information on demands in the overall service area as well as demands for Western supplies.

**Table 2-11  
Projected Water Use Other Developments (AF)**

	Type of Use	Acres/Units		Water Duty Factor		Total Estimated Demand (AF)
<b>Riverside Retail Area</b>						
Alessandro Business Park	Commercial	78.04	acres	0.72	per acre	56
Alessandro Commercial Center	Commercial	54.4	acres	0.72	per acre	39
LifeCare Campus	Institutional	188.8	acres	0.85	per acre	161
<i>Total Projected Water Use Other Developments - Riverside Retail Area</i>						<b>256</b>
<b>Murrieta Retail Area</b>						
Crossroads Church (MCWD WO 5091)	Institutional	4.56	acres	0.85	per acre	4
Golden Triangle (MCWD WO 5093)	Commercial	64.28	acres	0.72	per acre	46
Westside Marketplace (MCWD WO 5083)	Commercial	35.33	acres	0.72	per acre	25
Murrieta Education Center (MCWD WO 5098)	Institutional	12.97	acres	0.85	per acre	11
Olivewood (MCWD WO 5059)	Commercial	5.91	acres	0.72	per acre	4
Plaza de Murrieta (MCWD WO 5073)	Residential	240	EDUs	1.06	per EDU	254
<i>Total Projected Water Use Other Developments - Murrieta Retail Area</i>						<b>345</b>

**Table 2-12  
All Anticipated Demands Western Retail Areas (AF)**

Area	2015	2020	2025	2030	2035	Buildout
Riverside Retail Area	28,805	32,895	36,985	41,074	45,164	49,254
Murrieta Retail Area	3,317	3,489	3,661	3,833	4,005	4,177
Rainbow Retail Area	1,651	1,992	2,334	2,676	3,017	3,359
<i>Total without additional conservation</i>	<b>33,773</b>	<b>38,376</b>	<b>42,979</b>	<b>47,583</b>	<b>52,186</b>	<b>56,790</b>
<i>Total with conservation (assumed to be 5% by year 2015 and 10% by year 2020)</i>	<b>32,084</b>	<b>34,538</b>	<b>38,682</b>	<b>42,825</b>	<b>46,968</b>	<b>51,111</b>

**Table 2-13  
Western Wholesale Area Demands (AF)**

<b>Agency</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>	<b>Notes</b>
Box Springs Mutual Water Company							1
Overall Demand	751	761	772	782	792	802	
Demand for Western Supplies	85	85	85	85	85	85	
City of Corona							2
Overall Demand	45,431	46,167	46,938	47,812	48,757	49,721	
Demand for Western Supplies	20,511	21,247	22,018	22,892	23,837	24,801	
City of Norco							1
Overall Demand	7,847	8,087	8,328	8,568	8,809	9,049	
Demand for Western Supplies	5,699	5,874	6,049	6,223	6,398	6,573	
City of Riverside							1
Overall Demand	78,215	82,253	86,291	90,329	94,368	98,406	
Demand for Western Supplies	1,633	1,717	1,801	1,886	1,970	2,054	
Eagle Valley Mututal Water Company							3
Overall Demand	550	550	550	550	550	550	
Demand for Western Supplies	550	550	550	550	550	550	
Elsinore Valley Municipal Water District							2
Overall Demand	40,985	47,021	51,468	55,197	58,860	62,523	
Demand for Western Supplies	32,385	38,421	42,421	46,597	50,260	53,923	
Jurupa Community Services District							2,4
Overall Demand	28,172	30,045	31,918	33,791	35,664	37,537	
Demand for Western Supplies	0	5,000	6,500	8,000	10,000	10,525	
Lee Lake Water District							1
Overall Demand	6,364	6,839	7,314	7,790	8,265	8,740	
Demand for Western Supplies	5,694	6,169	6,644	7,120	7,595	8,070	
Rancho California Water District							2,5
Overall Demand	92,999	97,077	98,485	98,931	100,729	112,377	
Demand for Western Supplies	26,764	29,362	30,066	30,289	31,188	34,794	
Riverside Highlands Water Company							2
Overall Demand	5,100	5,945	7,210	7,950	7,950	7,950	
Demand for Western Supplies	0	0	0	0	0	0	

Table 2-13 (cont.)

Agency	2015	2020	2025	2030	2035	Buildout	Notes:
Rubidoux Community Services District							1
Overall Demand	7,498	7,845	8,193	8,540	8,887	9,234	
Demand for Western Supplies	0	0	0	0	0	0	
Total Projected Demands in Western Service Area without additional Conservation	313,912	332,591	347,467	360,240	373,631	396,890	
Total Projected Demands in Western Service Area with Conservation (10% by 2015, 20% by 2020)	282,521	266,073	277,973	288,192	298,904	317,512	
Total Projected Demand for Western Supplies without Additional Conservation	93,321	108,425	116,135	123,642	131,883	141,376	
<b>Total Projected Demand for Western Supplies with Conservation</b> (assumes local purveyors achieve 10% by 2015, 20% by 2020)	83,989	86,740	92,908	98,913	105,506	113,100	
Source:							
1 Estimates from WDF Model							
2 Projections provided by agency							
3 Estimates based on past data provided by agency							
4 Overall Jurupa Demand and Buildout year data estimated from WDF, all other data provided by agency							
5 Rancho California Water District demand at Buildout estimated from WDF, all other data provided by agency							

#### 2.4.4 Projected Other Water Uses

As in the past, Western does not anticipate future water use related to saline barriers, groundwater recharge operations, or recycled water. For the purpose of projections, unaccounted-for water is assumed to be eight percent. Table 2-14 provides projections for these water uses through the anticipated buildout of the Western service area.

Table 2-14  
Future "Other" Water Uses (AF)

	2015	2020	2025	2030	2035	Buildout
Groundwater Recharge	0	0	0	0	0	0
Saline Barriers	0	0	0	0	0	0
Recycled Water	0	0	0	0	0	0
System Losses	2,567	2,763	3,095	3,426	3,757	4,089

#### 2.4.5 Total Forecasted Demands on Western's Water Supplies

Table 2-15 provides total forecasted demands for Western's water supplies from 2015 until buildout. By year 2035 forecasted demand will increase by approximately 91%. At buildout (estimated sometime after year 2040), total demands on Western water supplies would be approximately 168,300 AFY, almost double the current demands.

**Table 2-15  
Total Forecasted Demands on Western's Water Supplies (AF)**

<b>Water Use<sup>1</sup></b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
Total Forecasted Demand for Western Retail Areas (Table 2-12)	32,084	34,538	38,682	42,825	46,968	51,111
Total Forecasted Demand Western Wholesale Area (from Table 2-13)	83,989	86,740	92,908	98,913	105,506	113,100
Total Forecasted Demand "Other Water Uses (Table 2-14)	2,567	2,763	3,095	3,426	3,757	4,089
<i>Total</i>	<i>118,640</i>	<i>124,042</i>	<i>134,684</i>	<i>145,164</i>	<i>156,231</i>	<i>168,300</i>
1 Assumes conservation						

#### 2.4.6 Water Use Projections for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for new single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. Western retail areas fall within the City of Riverside (Riverside service area), unincorporated Riverside County (Riverside and Rainbow service area) and the City of Murrieta (Murrieta service area).

The County of Riverside updated its housing element in November 2010. The housing element estimates that approximately 37.9 percent of all households in the western portion of Riverside County are “very-low” or “low” income. Because the majority of the Riverside retail area, and all of the Rainbow area are in unincorporated Riverside County, it is assumed that for these retail areas 37.9 percent of all the increase in retail demand for years 2015 to 2035 will be demand for new very-low or low-income households (see Table 2-16).

The City of Murrieta updated its housing element in October 2010. The housing element estimates that 11 percent of all households in the City are “very low” or “low income”. It is assumed that 11 percent of all the increase in Murrieta retail area demand for years 2015 to 2035 will be demand for new very-low or low-income households (see Table 2-16).

Demands in Table 2-16 are included within the water demands described in 2-15 and assume conservation.

**Table 2-16  
Projections of New Low-Income Household Water Use (AF)**

<b>Water Use<sup>1</sup></b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Riverside	8,822	9,570	10,783	11,996	13,209
Murrieta	283	284	300	316	331
Rainbow	218	320	434	547	661
Total	9,323	10,175	11,517	12,859	14,202
1 Assumes conservation.					

## **2.5 OTHER FACTORS AFFECTING WATER USAGE**

Two major factors that affect water usage are weather and water conservation. Historically, when the weather is hot and dry, water use increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool and wet years, historical water usage decreases to reflect less water usage for exterior landscaping. Both weather effects and conservation effects are discussed below.

### **2.5.1 Weather Effects on Water Usage**

Western experiences variations in water use throughout the year. During the winter months (December-February), water use is lower than any other time of year; while the summer months between July and September sees the highest water use. Average monthly water use during the summer months is typically over 50% higher than the annual monthly average, while during the winter months it is 30% lower than the annual monthly average.

During hot dry years the annual average GPCD has increased by approximately 13% from an average year; while the GPCD during a cool wet year has decreased by approximately 15% from an average year.

## **2.6 DEMAND MANAGEMENT MEASURES**

In order to meet the future demand for water in Western's service area, supply projects must be coupled with an expectation of greater water use efficiency by all customers within Western. Water use efficiency has become a core business component in Western's customer partnership, with the understanding that water efficiency enables continued economic development and maintenance of the local living environment.

In response to the growing concerns regarding the reliability of imported water supplies and the need for increased water use efficiency, Western developed and implemented a Water Use Efficiency Master Plan (WUEMP) in 2008, which is included in Appendix C. The WUEMP assists customers within Western's wholesale and retail service area to become water efficient, and also addresses short-term drought restrictions and imbeds water-use efficiency into Western's policies and customer ethics. The vast majority of Western's urban water use is in landscape uses and therefore Western has focused its water conservation activities on this sector for the largest and most cost effective savings.

As both a wholesaler and as a retailer, Western is subject to the Urban Water Management Planning Act, AB1420 and SBX7-7 requirements, in addition to the commitment of compliance with the Best Management Practices (BMPs) as a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU). Western submits annual reports in accordance with the MOU, separately as a retailer and as a wholesaler.

The MOU and BMPs were revised by the California Urban Water Conservation Council (CUWCC) in 2008. The revised BMPs now contain a category of "Foundational BMPs" that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator,

wholesale agency assistance programs and water waste ordinances) and Public Education (public outreach and school education programs). The remaining “Programmatic” BMPs have been placed into three categories: Residential, Large Landscape, and Commercial, Industrial, Institutional (CII) Programs and are similar to the original quantifiable BMPs. These revisions are reflected in the CUWCC reporting database starting with reporting year 2009 and the 2010 UWMP’s DMM compliance requirements. The new category of Foundational BMPs is a significant shift for retail agencies in the revised MOU. For wholesalers however, these changes do not represent a substantive shift in requirements.

A key intent of the recent MOU revision was to provide retail water agencies with more flexibility in meeting requirements and allow them to choose program options most suitable to their specific needs. Therefore, as alternatives to the traditional Programmatic BMP requirements, agencies may also implement the MOU Flex Track or GPCD options.

The GPCD option sets a water use reduction goal of 18 percent reduction by 2018. The MOU defines the variables involved in setting the baseline and determining final and interim targets. The GPCD option and requirements track well with the requirements of SBX7-7.

Under the Flex Track option, an agency is responsible for achieving water savings greater than or equal to those it would have achieved using only the BMP list items. The CUWCC has developed three Flex Track Menus – Residential, CII, and Landscape – and each provides a list of program options that may be implemented in part or any combination to meet the water savings goal of that BMP. Custom measures can also be developed and require documentation on how savings were realized and the method and calculations for estimating savings. Western is implementing the Flex Track approach to compliance.

Signatories to the urban MOU are allowed by Water Code Section 10631(j) to include their biennial CUWCC BMP reports in an UWMP to meet the requirements of the DMM sections of the UWMP Act. Due to delays and challenges with the CUWCC database, Western has chosen to comply with the requirements of the Act by providing the information required by the DMMs in this section of the Plan as well as attaching the reports in Appendix B.

As a wholesaler MOU signatory, Western assists its retail agencies with BMP implementation but is responsible for the implementation of only a subset BMPs. Western works closely with its retail agencies to help fund, market, and implement a number of BMP programs. Within its retail areas Western is responsible for all of the BMPs. The following sections provide more detail Western’s conservation programs and compliance with the BMPs.

### **2.6.1 Wholesale Area Programs**

The following is a brief summary of the implementation actions undertaken by Western as a wholesaler.

## Utility Operations Programs

### ***BMP 1.1: Operation Practices for Wholesalers***

Western provides financial and technical assistance and helps build partnerships with its retail agencies to promote conservation. In addition to rebate incentives provided by the Metropolitan Water District through the SoCal WaterSmart Program, Western provides additional incentives for high efficiency toilets and clothes washers, smart irrigation controllers, and high efficiency sprinkler nozzles. Western has also partnered directly with its largest member agency, the City of Riverside, to provide high efficiency sprinkler nozzles to its customers, with the City of Corona for commercial turf replacement and pool cover programs, with EVMWD for low flow residential toilet installation and with RCWD on agricultural efficiency programs. The following further describes Western's support to its retail agencies:

- **Rebate Supplements:** Western provides retail agencies with funding to supplement their rebate programs for residential and CII customers. In fiscal year 2010, Western distributed \$65,000 in residential rebate supplements, and \$100,000 in CII rebate supplements.
- **Residential Landscape Program:** This program provides residents of the City of Riverside with sprinkler nozzles; in 2010 Western provided \$45,000 in program funding.
- **Large Landscape Program:** Western funds a smart controllers program; in FY 2010, the budget was \$117,500. Western also provides landscape audits and evaluations through the Riverside-Corona Resource Conservation District (RCRCD).
- **Pool Cover Rebate Program:** Western provides the City of Corona a rebate program for pool covers. In 2010 Western provided \$5,000 in program funding.
- **High Efficiency Toilet (HET) Replacement Program:** HET direct install programs are offered to Multi Family residents. In 2010, Western also helped fund a single family residential HET direct install in the EVMWD service area. In 2009 and 2010 Western offered \$258,366 and \$105,000 respectively.
- **Landscape Education Program:** Free climate-appropriate landscape workshops are provided for residents who want to learn more about gardening and conservation. Smart irrigation technology training workshops are also provided.
- **School and Public Information Programs:** See BMP 2.2.
- **CUWCC Membership Assistance:** Western encourages retail agencies to become and maintain a CUWCC membership by paying for 50% of all retailers' CUWCC membership dues.

### ***BMP 1.1.: Water Conservation Coordinator***

Western has maintained a full-time water conservation coordinator position since 1990. The water conservation coordinator implements both wholesale and retail area programs.

### ***BMP 1.2: Water Loss Control***

Western has eight wholesale customers, served through twenty meters. The Metropolitan Water District owns and maintains all but three of these meters. Western's operations staff performs annual meter calibrations on all wholesale meters. In 2010, Western had no leaks in its wholesale distribution system.

Consistent with the revised MOU, Western will implement AWWA's Standard Water Audit Approach per the M36 manual in order to develop a water balance. The approach consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. The 2010 analysis will be performed in 2011.

### ***BMP 1.3: Metering with Commodity Rates***

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

## **Educational Programs**

### ***BMP 2.1: Public Information Programs***

Western provides extensive public outreach to the communities it serves, exceeding the requirement of quarterly contact. Water conservation promotion is conducted through press releases and events, paid advertising, bill inserts, customer newsletter, landscape water conservation media campaigns, website program brochures, speaker's bureau and cooperative partnerships with other retail agencies and other area partners.

Western also sponsors a variety of community programs. The Community Water Festival is an annual one-day festival celebrating water that attracts hundreds of people to Temecula every spring. Through its Water Talk program, Western staff present water information to local service groups and chambers of commerce within its service area. Additionally, during the months of September through May, seminars are conducted for the general public addressing such topics as landscape design, irrigation methods, drip irrigation systems and many other subjects that impact the water efficiency of a homeowner's landscape. Western's Public Information Programs is designed to deliver the message that:

- Imported water supplies are unreliable at times;
- Demand for quality water has increased over time;
- Conservation efforts and efficient use are highly effective means to stretch and extend water resources;
- Western has incentive programs and support mechanisms that will increase water efficiency and benefit customers.

In addition, Western has a water conservation garden, Landscapes Southern California Styles. This one acre water conservation demonstration garden was designed to encourage public acceptance, desire for, and use of water-efficient landscape.

### ***BMP 2.2: School Education Programs***

Western sponsors a regional school education program in its general service area and has been a leader in the field of water education support for area schools since 1982. Western's School Program is designed to encourage and assist educators as they teach students about water supply,

distribution, reclamation, conservation and the future of water supplies. The material and services offered meet the requirements of the California Science Framework Addendum and are provided at no charge to participating teachers, schools and students, public and private. Western conducts class presentations and teacher's workshops, and offers materials including student workbooks, water cycle bracelets, earth balls, water story rocks, assembly-related material, teachers' guides, videos, speakers and field trips. Complete class water education units are also distributed along with needed in-servicing.

Although classes are offered to all its retailers, in 2009 and 2010 only the Western retail service area participated. The other retailers staff their own programs. The number of students reached by Western's school education program is provided in Table 2-17.

**Table 2-17**  
**School Education (Number of Students)**

Grade Level	2006	2007	2008	2009	2010
K - 6	7,004	11,671	2,175	2,500	3,000
7 - 12	1,032	1,522	1,700	6,569	9,295
Totals	8,036	13,193	3,875	9,069	12,295

Western also provides additional school program activities, which are provided in Table 2-18. In 2010 the class presentations were discontinued due to staffing issues. Western is currently looking to fill that role with a part time position at which point the class presentation program will be reinstated.

**Table 2-18**  
**School Program Activities (Number of Attendees)**

Activity	2009	2010
Classroom Presentation	0	0
Large Group Assemblies	5,175	7,910
Children's Water Festivals or other events	125	200
Water Conservation Contests	4	0
Awards or Scholarships to Students	2	0
Teacher Training Workshops	0	19

Since 1995, Western Municipal Water District has offered educators in western Riverside County the opportunity to apply for grants of up to \$700 for water-related projects. This widely popular program helps fund creative classroom projects that further a better understanding of water and the vital role it plays in the community. All teachers in Western's District, in both private and public schools in grades K -12, are eligible to apply for these grants.

## **2.6.2 Retail Area Programs**

The following is a brief summary of the implementation actions undertaken by Western as a retail service provider. Western plans to implement Programmatic BMPs 3 and 4 through a Flex Track approach and BMP 5 through the Traditional BMP approach.

## **Utility Operations Programs**

### ***BMP 1.1.1: Water Conservation Coordinator***

Western shares a water conservation coordinator for both its retail and whole areas, as described above.

### ***BMP 1.1.2: Water Waste Prohibition***

Prior to 2009, Western's Ordinance 362 set rules and regulations governing water service and water users and prohibited water waste. In 2009, Western adopted Ordinance 375, which established a Water Conservation and Supply Shortage Program. The ordinance requires Stage 1 baseline action and reduction measures which prohibit water waste activities at all times. It addresses water use for residential, commercial, industrial, agricultural, and governmental uses for activities including but not limited to: excessive irrigation, uncorrected leaks, washing down paved areas, car washing, use of water hoses and sprinklers, decorative fountains, swimming pools, and construction operations. A copy of Ordinance 375 is included in Appendix B.

### ***BMP 1.2: Water Loss Control***

Western repairs all reported leaks and breaks to the extent cost effective. In FY 2009, 69 leaks were repaired at a cost of \$538,977, and in 2010, 79 leaks were repaired at a cost of \$688,523. In FY 2010, Western started calibrating all large commercial customers with meters 3" and above. Western will start a formal system audit, leak detection and repair program in fiscal year 2014 within both its retail and wholesale areas. Western will also complete AWWA's M36 Water Loss Analysis for FY 2010 in 2011.

### ***BMP 1.3: Metering with Commodity Rates***

All of Western's connections are metered and billed monthly with commodity rates. Western is in the process of adopting a water budget rate structure, planned for implementation in fall 2011. Water budgets will be comprised of an indoor daily gallons per capita component and an outdoor volume based on landscaped area and parameters established in the State Landscape Model Ordinance.

Western has also submitted a memo to the CUWCC detailing its meter testing and replacement policy. This policy consists of the following three parts (Appendix B):

- Western uses the customer billing system to track all installed meters by size, type, date installed, customer account type, and warranty information.
- Western has a yearly testing program of all meters for the wholesale division and all large meters over 3" for the retail division. These meters are tested annually and all necessary repairs are performed to maintain AWWA accuracy.
- Western has an annual program to assess the performance of meters for its retail division. 10 percent of the meters from each read route are evaluated annually for accuracy. All necessary replacements are made based on the test results.

### ***BMP 1.4: Conservation Pricing***

Western charges commodity rates for all of its connections. In 2010, 73 percent of Western's total revenue came from commodity charges; see attached BMP reports. Western will be

implementing a water budget rate structure in fall 2011 (see BMP 1.3) with the intention of complying with the 70 percent volumetric threshold specified in the BMP.

## Educational Programs

### ***BMP 2.1: Public Information Programs***

Western, the wholesale purveyor, implements this program for its retail area in conjunction with its wholesale area programs, as described above. Western provides informational materials to customers through their website, media events, landscape conservation campaigns and other. Western also communicates with its customers through newspaper articles, paid advertising, bill inserts, its website (<http://www.wmwd.com>) and public service announcements. Conservation messages are also included on customers' bills.

Western has sponsored a customer satisfaction market research in order to properly refine their message. Western's brand message is, "Securing Your Water Supply" and their mission statement is, "Western Municipal Water District provides water supply, wastewater disposal and water resource management to the public in a safe, reliable, environmentally sensitive and financially responsible manner."

Western also has a number of events that inform the public of water conservation techniques and tips. These events include Earth Night in the Garden, Water Talk Program, and the Annual Community Water Festival. See the BMP reports in Attachment B for more program detail.

### ***BMP 2.2: School Education Programs***

Western implements this program for its retail area in conjunction with its wholesale area programs, as described above. Programs include presentations, field trips and assemblies for grades kindergarten through 12. Materials distributed comply with state standards. The materials distributed to students in grades kindergarten through 6 include a water cycle bracelet, an earth ball, water story rock, and assembly-related material. Students in grades 7 through 12 receive scout badges, solar related sponsorship, and assembly program related material. Table 2-19 provides the number of students reached by Western's education program over the last 5 years.

**Table 2-19**  
**School Education (Number of Students)**

Grade Level	2006	2007	2008	2009	2010
K - 6	3,700	9,539	8,594	2,500	3,000
7 - 12	1,300	50	120	6,569	9,295
Totals	5,000	9,589	8,714	9,069	12,295

## Programmatic BMPs

Western is implementing the following programs through a Flex Track approach:

- Indoor water surveys (BMP 3.1A),
- Residential Plumbing Retrofits Program (BMP 3.1B), and
- Large Landscape Conservation Programs and Incentives (BMP 5)

Western will be instead implementing programs that focus primarily upon the residential landscape sector which accounts for nearly 70% of the region's water use. The rest of the BMPs are being implemented as defined in the MOU (Traditional BMP approach).

The following section describes the BMPs implemented through the traditional approach. The Flex Track program and calculations are in Section 2.6.3. Further detail is provided in the BMP reports in Appendix B.

## **Implementation: Traditional Approach**

### **BMP 3: Residential Programs**

#### ***BMP 3.1A: Indoor Water Surveys***

See Section 2.6.3.

#### ***BMP 3.2 Outdoor Water Surveys***

Western implements Outdoor Residential Surveys through its Smart Yard program. The Smart Yard program is a residential Weather-Based Irrigation Controller (WBIC) retrofit program that provides a landscape survey and consultation, installation of WBICs with five years of service, hardware, and follow-up visits. The program seeks to produce water savings by reducing or eliminating overwatering of landscapes through the use of smart irrigation controllers.

Residential customers in Western's retail service area are eligible to participate in the program. When a customer signs up, their water usage and potential savings are analyzed. A Smart Yard consultant visits their home to conduct a survey of the landscape and irrigation system and to determine eligibility. After the devices are installed, a follow-up consultation may be performed. The customer pays back 50 percent of the program cost over 5 years through a fixed charge on their water bill. The program provides savings for both Western and its customers; it is expected to save over 3,000 AF over 10 years and save the average customer approximately 25 percent on their water bill after program costs are applied. The program is advertised online and more information can be found at <http://www.westernsmartyard.com>.

In 2010, Western also began providing landscape water surveys to customers. In FY 2010, Western provided 495 single family customers with landscape water surveys, yielding a water savings of about 18.5 AFY.

In addition, Western also sponsors a sprinkler nozzles distribution program for residential customers in its retail service area, and also operates the program in conjunction with the City of Riverside. The program provides vouchers for free Precision Sprinkler Nozzles, which help reduce sprinkler system water use by up to 30%. The program is advertised online and more information can be found at <http://www.freesprinklernozzles.com>.

In FY 09/10, Western's budget for Outdoor Water Surveys was \$129,000, and Western plans to budget \$120,000 a year for this program in the future. As a part of Western's Flex Track approach, these rebate programs will contribute water savings to reach its water savings goal.

### **BMP 3.3: High-Efficiency Washing Machine Rebate Programs**

Western participates with MWD in their SoCal Water\$mart rebate program which offers High-Efficiency Clothes Washer (HECW) rebates. MWD provides a \$50 rebate, and Western provides an additional \$150. The number of rebates distributed to Western's residential customers is presented in Table 2-20. In FY 09/10, Western had a budget of \$30,000 for HECW rebates which it plans to maintain in the future.

**Table 2-20  
HECW Rebates**

	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
HECW Rebates	87	150	95	223	85

### **BMP 3.4: Residential High Efficiency Toilet (HET) Replacement Program**

Western participates with Metropolitan in their SoCal Water\$mart rebate program which offers High-Efficiency Toilet (HET) rebates. Metropolitan provides a \$50 rebate, and Western provides an additional \$150. The number of rebates provided to Western's single family customers is provided in Table 2-21. Additionally, Western operates a direct install program to install HET's for multi-family residential complexes. In FY 09/10, Western had a budget of \$25,000 for the HET program and anticipates future annual budgets of \$30,000.

**Table 2-21  
Single Family HET Rebates**

	<b>2006*</b>	<b>2007*</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
SF HET Rebates	118	21	12	43	143

Note: The rebates provided in 2006 and 2007 were Ultra Low Flush Toilets (ULFT) with a factor of 1.6 gpf or less, compared to HET's water factor of 1.2 gpf or less.

### **BMP 3.4 Water Sense Specification for New Development**

This DMM encourages replacement of old plumbing fixtures with WSS<sup>1</sup> fixtures. To be in compliance with this DMM a water agency must provide incentives such as rebates, recognition programs, reduced connection fees, or have ordinances requiring residential construction meeting WSS for single and multi-family housing. These incentives are to be offered until the California universal retrofit on resale statute<sup>2</sup> goes into effect (year 2014) or until all new residential construction meets WSS standards.

Western does not have direct regulatory jurisdiction to develop local ordinances but will support local jurisdictions in implementing and promoting codes that support efficiency. Western will

<sup>1</sup> WaterSense is an Environmental Protection Agency sponsored program that promotes water-efficient products, programs, and practices. In order to carry the WSS label a product must be independently certified as using 20 percent less water than average products in that category.

<sup>2</sup> Effective January 1, 2014, Senate Bill 407 requires that all pre-1994 residential, multi-family and commercial customers replace non-compliant plumbing fixtures (including toilets, faucets, and shower heads) with water-conserving fixtures when making certain improvements or alterations to a building. By 2017, all single family homes must replace non-compliant plumbing fixtures, and by 2019, all multifamily and commercial buildings must have compliant water-conserving plumbing fixtures in place.

participate in implementation of the 2010 CAL Green Code which was adopted by the Building Standards Commission in January 2010 and will go into effect January 2011. The Code sets mandatory green building measures, including a 20 percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design; the Code also identifies voluntary measures that set a higher standard of efficiency, which can also be adopted.

It is anticipated that indoor water use in WSS homes will be 20 percent lower than in older homes that do not have WSS plumbing fixtures. The amount of water savings, however, will depend on the extent of future residential development.

**Additional Residential Programs**

Synthetic Turf: Rebates are provided to Western’s customers through MWD’s SoCal Water \$mart program. Rebates are available for replacements less than 1/2 acre. Western is offering 40 cents a square foot to homeowners who replace their grass with climate appropriate plants. Program square footage and water savings are provided in Table 2-22.

**Table 2-22  
Synthetic Turf Rebates and Savings**

	<b>2009</b>	<b>2010</b>
Quantity Installed (square feet)	10,806	5,311
Measured Water Savings (AF/YR)	1.51	0.74

Toilet Upgrades: Through the SoCal Water\$mart program, participants are able to upgrade from an existing ULFT to an HET. In 2009, two upgrades were made.

**BMP 4: Commercial, Industrial & Institutional Water Conservation Program**

The Save-A-Buck Regional Rebate Program for CII customers, offered through MWD in partnership with Western, provides rebates for WaterSense devices. The program offers rebates up to \$210 for commercial clothes washers, up to \$100 for waterbrooms, \$625 for cooling tower conductivity controllers, \$60 for pre-rinse kitchen spray nozzles, \$3,120 for x-ray machine recirculating devices, \$50-\$165 for high-efficiency toilets and \$200-\$400 for waterless urinals. The number of CII rebates distributed to Western’s CII customers is provided in Table 2-23. The measured water savings these devices have provided can be found in the 2009 and 2010 BMP reports (Appendix B).

Western separately provides rebates for waterless urinals. Western’s budget for this program in FY 09/10 was \$65,340, and projects a future annual budget of \$60,000.

**Table 2-23  
CII Rebates**

Device Type	2006	2009	2010
HET	84	0	1
Ultra Low Volume Urinals	0	1	0
Zero Consumption Urinals	157	1	4
CII HECW	81	3	0
Cooling Tower Controllers	2	0	0

Note: No CII Rebates were distributed in FY 2007 or 2008

### ***BMP 5: Large Landscape Conservation Programs and Incentives***

In fall of 2011, Western will adopt a budget-based water rate structure which will include a component for outdoor water use based on landscaped area and parameters established in the State Landscape Model Ordinance. In addition, its Large Landscape program provides WBICs devices to residential areas including Home Owners Associations with more than 1 acre of landscaped area. The program provides rebates and direct installations of WBICs, high efficiency sprinkler nozzles, and synthetic turf. In FY 09/10, Western had a budget of \$960,000 for this program and anticipates implementing the program at this level in the future.

In 2009, Western, in participation with the Riverside County Water Task Force, developed the Riverside County Landscape Water Use Efficiency Ordinance. As of January 2010, this ordinance had been adopted by the County of Riverside and the cities of Corona, Canyon Lake, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Perris, Riverside, and Temecula. This ordinance:

- Establishes a structure for planning, designing, installing, maintaining, and managing water efficient landscapes in new construction and rehabilitated projects
- Requires that landscapes not exceed a maximum water demand of seventy percent (70%) of its reference evapotranspiration (ET<sub>o</sub>) or any lower percentage as may be required by water purveyor policy or state legislation
- Applies to existing properties with landscape areas one acre or greater in size or properties served by a dedicated landscape irrigation meter
- Applies to all new construction landscapes which are homeowner-provided and or homeowner-hired in single-family and multi-family projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan checks or design review
- Requires setting a Maximum Applied Water Allowance for new construction and existing landscapes, based on reference evapotranspiration

Western is building upon the Landscape Water Use Efficiency Ordinance in order to achieve the water conservation required by SBX7-7. Specifically Western is:

- Targeting non-dedicated irrigation meter accounts
- Establishing water budgets for those accounts with dedicated irrigation meters
- Establishing an allocation-based conservation water pricing structure

Western initiated these programs in 2008. Dedicated irrigation meters will have water budgets by October 2011. Western has prepared a draft of the allocation based water pricing structure and this structure is anticipated to go into affect in fall 2011.

### 2.6.3 Flex Track Savings

For the Indoor Water Surveys, Residential Plumbing Retrofits, and Large landscape Conservation Program BMPs, a Flex Track approach to compliance was developed.

As described earlier, in 2008 Western completed a Water Use Efficiency Master Plan (provided as Appendix C). This plan evaluated water use by sector, the infiltration of existing water conservation technologies, planned developments in the service area, the potential for emerging technologies to enhance water conservation, and the potential water savings methods evaluated for cost, water savings, and ease of implementation. The Water Use Efficiency Master Plan identified a substantial opportunity to reduce water consumption for landscape irrigation particularly within the single family residential sector. This sector comprises 70% of Western potable water consumption with 60% of the water being used outdoors primarily for landscape irrigation. Western will target landscape water use across all sectors (residential, commercial, institutional, and industrial) as a means to reduce water consumption consistent with the goals of both the DMMs and SBX7-7.

In quantifying the Flex Track approach, Western first quantified the savings that would be achieved from the BMP checklist approach (Table 2-24) by determining the level of activity required and calculating the associated savings using CUWCC methodology and assumptions.

**Table 2-24  
Flex Track Water Savings Estimates – Required Savings from BMP Approach**

<b>Program</b>	<b>Units Required/Year by BMP Approach</b>	<b>Total Water Savings by 2020 (AF)</b>	<b>Lifetime Water Savings (AF)</b>
Residential Assistance (Surveys)	316	587	1,364
Residential Plumbing Retrofit kits	316	98	126
Large Landscape Irrigation Surveys	8	118	202
Residential Landscape Surveys	316	320	548
Total		1,123	2,240
<sup>(a)</sup> Source: January 2011 AB1420 Compliance Documents			

The next step was identifying and quantifying the programs proposed for implementation in their stead. The programs Western has identified for implementation are in Table 2-25, where their potential savings have been quantified. These calculations demonstrate that through a Flex Track approach focusing on outdoor residential water use, Western will be able to conserve nearly twice as much water as through a BMP Checklist approach for the Residential Assistance and Landscape Water Surveys, Residential Plumbing Retrofits, and Large Landscape Conservation Program BMPs.

**Table 2-25**  
**Flex Track Water Savings Estimates – Savings Projected through Flex Track Approach**

<b>Program</b>	<b>Units Implemented/Year</b>	<b>Total Water Savings by 2020 (AF)</b>	<b>Lifetime Water Savings (AF)</b>
Residential WBICs Direct Install	251	855	1,988
Residential WBICs Rebates	18	61	143
Residential Precision Nozzles Distribution	8,991	578	898
Residential Cash for Grass	9,700	74	171
Residential Landscape Surveys	500	505	867
Total		2,073	4,067
<small>(a) Source: January 2011 AB1420 Compliance Documents</small>			

The actual savings for FY 2009 and 2010 that Western has obtained through the flex track approach is provided in Table 2-26, and a detailed breakdown can be seen in the 2009 and 2010 BMP reports.

**Table 2-26**  
**Actual Flex Track Water Savings in 2009 and 2010 (AFY)**

	<b>2009</b>	<b>2010</b>
BMP 3	39.03	124.50
BMP 4	0.59	0.53
Total	39.62	125.03

## **2.7 SBX7-7 IMPLEMENTATION PLAN**

Western will be expanding recycled water use in the retail area by 730 AF, for a total of 1,500 AFY, by year 2020. The increases in recycled water delivery and use will assist Western with achieving its water use target. The Demand Management Measures which Western is currently implementing and planning to implement are described in section 2.6 will allow Western to meet its SBX7-7 goals.



## Chapter 3.0 WATER RESOURCES

### 3.1 OVERVIEW

This section describes the water resources available to Western for the 25-year period covered by this plan. Western relies on three existing water sources: groundwater, imported water, and recycled water to meet its wholesale and retail demands. Planned supplies include new groundwater production and expanded recycled water. These existing and planned supplies are summarized in Table 3-1 and discussed in more detail below.

**Table 3-1  
Current and Planned Water Supplies (AF)**

<b>Water Supply Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies</b>							
<b>Wholesale and Purchased</b>							
Metropolitan Water District (Imported)	104,146	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	27,082	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>							
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0	0
Groundwater Murrieta Basin	1,000	1,600	1,600	1,600	1,600	1,600	1,600
Western Water Recycling Facility	950	950	950	950	950	950	950
<b>Banking Programs</b>							
San Bernardino Basin Area	6,000	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>151,778</b>	<b>181,463</b>	<b>204,277</b>	<b>214,281</b>	<b>225,451</b>	<b>238,185</b>	<b>238,185</b>
<b>Planned Supplies</b>							
<b>Local Supplies</b>							
Perris North Groundwater Basin	0	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	0	850	850	850	850	850	850
Chino Desalters Expansion	0	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	0	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>0</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>151,778</b>	<b>186,983</b>	<b>211,357</b>	<b>221,921</b>	<b>234,211</b>	<b>248,065</b>	<b>249,185</b>

## 3.2 WHOLESALE AND PURCHASED WATER SUPPLIES

### 3.2.1 Imported Water

Western obtains approximately 90% of its total supply through imported water sources from the Metropolitan Water District (MWD). About one-quarter of the water Western purchases from MWD comes from the Colorado River Aqueduct and about three-quarters from the State Water Project (SWP), which transports water from Northern California via the California Aqueduct. Western became a member agency of MWD in November 1954. Western has a purchase agreement for an initial base demand of 65,298.5 AF with a Tier 1 annual maximum of 58,768.7 AF<sup>1</sup>. Western has a Purchase Order Commitment for 391,791 AFY (see Appendix F). Western provides imported water for its direct retail customers in the unincorporated areas around Lake Mathews, portions of the City of Riverside, and the Murrieta area. For Western's wholesale customers, treated imported water is delivered through MWD's Mills water treatment plant (WTP) and Skinner WTP.

MWD's 2010 Regional Urban Water Management Plan provides a detailed description of its facilities and imported water supplies. MWD currently supplies an average of 50% of the total urban and agricultural water used within its boundaries. The remaining 50% comes from "local" sources provided by its member agencies.

Table 3-2 below provides a summary of the current and planned imported water supplies, to Western, from MWD. The demands documented in Table 3-2 have been provided to MWD and were included in MWD's 2010 Regional Urban Water Management Plan.

**Table 3-2  
Current and Planned Imported Water Supplies (AFY)**

<b>Water Supply Sources</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
Metropolitan Water District	131,228	160,313	174,127	184,131	195,301	208,035	208,035
<i>Total</i>	<i>131,228</i>	<i>160,313</i>	<i>174,127</i>	<i>184,131</i>	<i>195,301</i>	<i>208,035</i>	<i>208,035</i>

### Imported Supply Reliability

Increasing conflicts over the quantity and quality of the imported water from the SWP and Colorado River Aqueduct have led to increasing imported water costs. As part of its 2010 Regional Urban Water Management Plan, MWD evaluated the dependability of these supplies and concluded that the combination of imported water and expanded local resource programs would ensure its service area's demands would be met in the future. Western is relying on MWD's 2010 Regional Urban Water Management Plan to evaluate the reliability of imported supplies and the amount of imported water which will be available in the Western service area.

MWD adopted the Water Surplus and Drought Management Plan (WSDM) in 1998. The purpose of the WSDM was to maximize surplus water, when available, so as to minimize impacts of drought and water shortage. The main principles described by the WSDM are:

<sup>1</sup> MWD bills customers on a tiered system. Tier 1 supplies are set at 90% of the base demand and billed at Tier 1 rates. Supplies in excess of the Tier 1 amount are billed at the higher Tier 2 rate.

- 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 transfer and banking programs to secure more imported water for use in dry years.
- Increase public awareness about water supply issues.

MWD's 2008 Water Supply Allocation Plan (WSAP) built upon the WSDM Plan. The intent of the WSAP was to create an equitable needs-based allocation during periods of shortage. The WSAP formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of MWD supplies of up to 50%.

Imported water supply reliability was assessed during three scenarios: a normal water year, single dry year, and multiple dry years. The tables in this section present the supply-demand balance for the various drought scenarios for the twenty-five year planning period 2010-2035. Table 3-3 presents imported supply anticipated to be available to the Western service area during normal, single dry, and multiple dry water years.

**Table 3-3**  
**Imported Supply Projection in Single-Dry and Multiple Dry Year (AF)**

Water Year Type	2015	2020	2025	2030	2035
Average Year (average of 1992 to 2004 hydrology) <sup>1</sup>	160,313	174,127	184,131	195,301	208,035
Single-Dry Year (repeat of 1977 hydrology) <sup>2</sup>	160,313	174,127	184,131	195,301	208,035
Multiple Dry Year (repeat of 1990-1992 hydrology) <sup>3</sup>	160,313	174,127	184,131	195,301	208,035

<sup>1</sup> Based on data from MWD RUWMP Table 2-11.  
<sup>2</sup> Based on data from MWD RUWMP Table 2-9.  
<sup>3</sup> Based on data from MWD RUWMP Table 2-10.

### 3.2.2 Purchased Water

#### Meeks and Daley

This non-potable water supply is pumped from wells in the San Bernardino/Riverside area and wheeled through canals and pipelines under an agreement with Elsinore Valley Municipal Water District. This water is based on groundwater rights Elsinore Valley Municipal Water District holds in the Meeks and Daley Water Company. Western has the right to purchase up to 9 CFS of groundwater and transport the water through the Riverside Canal or Gage Canal to turnouts connecting to Western's non-potable system. The purchase agreement between Western and Elsinore Valley Municipal Water District is provided in Appendix F. Table 3-4 provides a summary of the current and planned Meeks and Daley water supply. As shown in Table 3-4, because this is a groundwater source it is assumed to be reliable during a single-dry and multiple-dry year.

## City of Riverside

When available, Western may purchase available water from the City of Riverside at the Mockingbird Pump Station. This is non-potable groundwater supply from the Gage Canal. Water is purchased from Riverside on an emergency or off-season basis. The purchase agreement between Western and the City of Riverside is provided in Appendix F. Table 3-4 provides a summary of the current and planned City of Riverside purchases. As shown in Table 3-4, because this is a groundwater source it is assumed to be reliable during a single-dry and multiple-dry year.

**Table 3-4**  
**Supply Reliability in Average, Single-Dry, and Multiple Dry Year - Water Purchases (AF)**

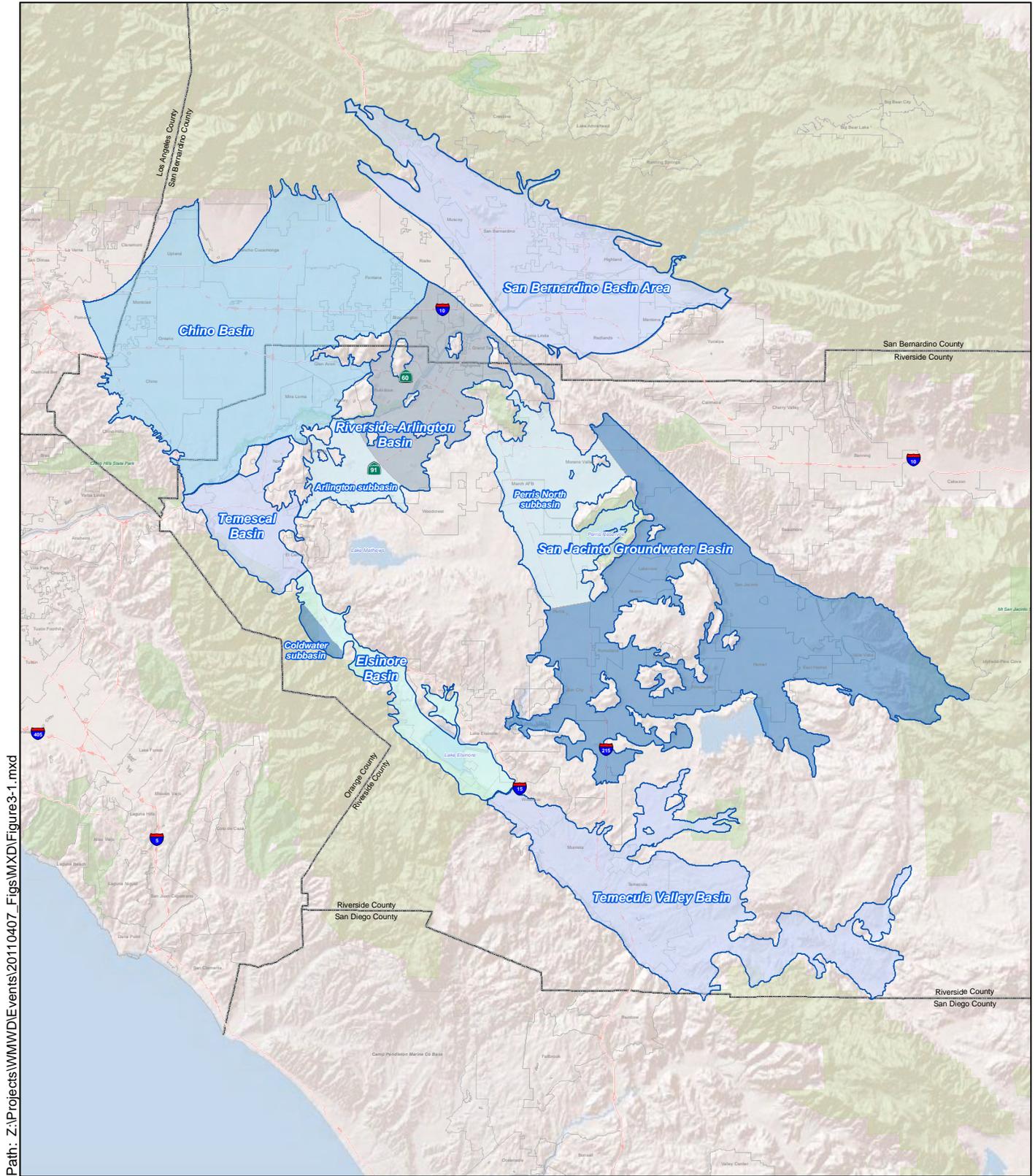
Supply and Water Year Type	2015	2020	2025	2030	2035
Average Water Year	6,200	6,200	6,200	6,200	6,200
Meeks and Daley	4,200	4,200	4,200	4,200	4,200
City of Riverside	2,000	2,000	2,000	2,000	2,000
Single-Dry Water Year	6,200	6,200	6,200	6,200	6,200
Meeks and Daley	4,200	4,200	4,200	4,200	4,200
City of Riverside	2,000	2,000	2,000	2,000	2,000
Multiple-Dry Water Year	6,200	6,200	6,200	6,200	6,200
Meeks and Daley	4,200	4,200	4,200	4,200	4,200
City of Riverside	2,000	2,000	2,000	2,000	2,000

### 3.3 GROUNDWATER

Groundwater is a major source of water supply for Western and its retail agencies. Most groundwater sources available to Western are adjudicated or subject to groundwater management plans. This section provides a description of groundwater management applicable to Western supplies, including groundwater adjudications, groundwater management plans, and groundwater pumping rights.

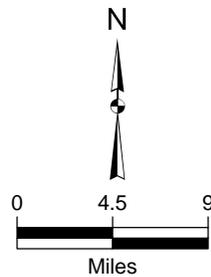
#### 3.3.1 Riverside-Arlington Groundwater Basin

Figure 3-1 shows the groundwater basins of the San Bernardino and Riverside county areas utilized by Western as part of its water supplies. The Riverside-Arlington subbasin (DWR 8-02.03) underlies part of the Santa Ana River Valley in northwest Riverside County and southwest San Bernardino County. This subbasin is bounded by impermeable rocks of Box Springs Mountains on the southeast, Arlington Mountain on the south, La Sierra Heights and Mount Rubidoux on the northwest, and the Jurupa Mountains on the north. The northeast boundary is formed by the Rialto-Colton fault, and a portion of the northern boundary is a groundwater divide beneath the community of Bloomington. The Santa Ana River flows over the northern portion of the subbasin. Annual average precipitation ranges from about 10 to 14 inches. The Riverside-Arlington subbasin is replenished by infiltration from Santa Ana River flow, underflow past the Rialto-Colton fault, intermittent underflow from the Chino subbasin, return irrigation flow, and deep percolation of precipitation (DPW 1934, Wildermuth 2000).



Path: Z:\Projects\WMWDEvents\20110407\_Figs\MXD\Figure3-1.mxd

Source: © 2009 ESRI; (c)2009 Microsoft Corporation



**Kennedy/Jenks Consultants**  
 Western Municipal Water District  
 Riverside County, California

**Groundwater Basins in the San Bernardino  
 and Riverside Area**

K/J 1089006\*00  
 May 2011  
**Figure 3-1**



The Arlington Groundwater Basin is a subsection of this basin. The Arlington Groundwater Basin is a shallow, alluvial-filled valley. In 2004, total groundwater storage in the Arlington Basin was estimated to be 80,000 acre-ft (Western 2009). The quality of Arlington Basin groundwater is generally poor with Total Dissolved Solids (TDS) concentrations on the order of 1,000 milligrams per liter (mg/L) and nitrate-nitrogen concentrations on the order of 20 mg/L (i.e. 90 mg/L as nitrate) (Western 2009). The Arlington Basin is not adjudicated. The Department of Water Resources has not identified the basin as overdrafted or projected to be overdrafted (DWR 2003).

The Arlington Desalter, operated by Western, is a reverse-osmosis groundwater treatment facility that is located at the western (down-gradient) end of the Arlington Basin. It is supplied by five nearby production wells. Operations at the Arlington Desalter began in 1990. The primary objectives of the Arlington Desalter are to provide a source of potable water and to decrease the subsurface outflow of poor quality groundwater to the Temescal Basin. Table 3-5 provides information on water pumped by Western from the Arlington Basin for years 2005 to 2009. Table 3-6 shows anticipated pumping from the Arlington Basin.

**Table 3-5  
Historic Groundwater Production (AFY) Arlington Groundwater Basin**

	2005	2006	2007	2008	2009
Groundwater Production	5,016	5,863	5,659	5,945	5,424
% of Total Water Supply	6%	7%	7%	7%	6%

**Table 3-6  
Projected Groundwater Production (AFY) Arlington Groundwater Basin**

	2015	2020	2025	2030	2035
Projected Groundwater Production	6,400	6,400	6,400	6,400	6,400
% of Total Water Supply	4%	3%	3%	3%	3%

### Arlington Supply Reliability

As described earlier, the water quality in the Arlington Basin is considered poor, high in both salts and nitrates. To deal with these water quality problems, water from the Arlington Basin is treated by the existing Arlington Desalter. With treatment, water from the Arlington Basin is considered a reliable source of water supply. As shown in Table 3-7, because this is a groundwater source it is assumed to be reliable during a single-dry and multiple-dry year.

**Table 3-7  
Supply Reliability in Average, Single-Dry, & Multiple-Dry Year - Arlington Groundwater (AF)**

Water Year Type	2015	2020	2025	2030	2035
Average Water Year	6,400	6,400	6,400	6,400	6,400
Single-Dry Water Year	6,400	6,400	6,400	6,400	6,400
Multiple-Dry Water Year	6,400	6,400	6,400	6,400	6,400

### 3.3.2 Temecula-Murrieta Basin

The Temecula-Murrieta Basin is part of the Temecula Valley Groundwater Basin (DWR 9-04) in southwestern Riverside County and northern San Diego County. The basin is bounded by nonwater-bearing crystalline rocks on the northeast, semiwater-bearing tertiary sedimentary rocks on the northwest and southwest, and the Pacific Ocean on the west. The valley is drained westward to the Pacific Ocean by the Santa Margarita River. Average annual precipitation ranges from 7 to 15 inches. There are two aquifers within the Temecula-Murrieta Basin: the Pauba aquifer and the Temecula aquifer. The Pauba aquifer is underlain by the confined Temecula aquifer. The Pauba aquifer covers approximately 18 square miles and the Temecula aquifer extends over an area of approximately 100 square miles. DWR reports groundwater storage within the two aquifers at approximately 250,000 AF (DWR 2003).

As part of the Santa Margarita River system, surface water and groundwater supporting surface water (defined as being in the older and younger alluvium) within the Temecula-Murrieta Basin have been under some form of court jurisdiction since 1928. Rights to utilize surface water and groundwater determined to be contributing to the Santa Margarita River are governed by the Modified Final Judgment and Decree entered on April 6, 1966 by the U.S. District Court in *United States v. Fallbrook Public Utility District, et al.* (Civil No. 1247-SD-T) (provided in Appendix G). In March 1989, the Court appointed a Watermaster to administer and enforce the provisions of the Modified Final Judgment and Decree and subsequent orders of the Court. The Court also appointed a Steering Committee that is currently comprised of representatives from the United States, Eastern Municipal Water District, Western Municipal Water District, Fallbrook Public Utility District, Metropolitan, the Pechanga Tribe, and RCWD. The purpose of the Steering Committee is to assist the Court and the Watermaster in administering the water rights (Santa Margarita River Watershed Watermaster Report 2006). The following presents a summary of the groundwater management agencies in the Temecula-Murrieta Basin:

- Santa Margarita River Watershed Watermaster – Court approved Watermaster for oversight and administration of water rights
- Santa Margarita River Watershed Steering Committee – Assist the Court and the Watermaster in administering the water rights
- Rancho California Water District – Prepares Groundwater Audit and Recommended Groundwater Production Report for operation of District groundwater wells and recharge facilities

The Groundwater Audit and Recommended Groundwater Production Report (RGPR) sets limits for producers in the Temecula-Murrieta Basin. The amount of groundwater that can be produced varies due to such factors as rainfall, recharge area, and amount and location of well pumping capacity. In November 2005, the Murrieta County Water District was consolidated with Western Municipal Water District as a result of action taken by the Local Agency Formation Commission (LAFCO). LAFCO voted to dissolve the Murrieta District with Western assuming responsibility for all functions and services. Table 3-8 provides information on water pumped by Murrieta County Water District and subsequently Western from the Temecula-Murrieta Basin for calendar years 2005 to 2009. Table 3-9 shows anticipated pumping from the Temecula-Murrieta Basin.

**Table 3-8  
Historic Groundwater Production (AFY) Temecula-Murrieta Groundwater Basin**

	2005	2006	2007	2008	2009
Groundwater Production	2,172	2,226	1,379	174	872
% of Total Water Supply	3%	3%	2%	0%	1%

**Table 3-9  
Projected Groundwater Production (AFY) Temecula-Murrieta Groundwater Basin**

	2015	2020	2025	2030	2035
Projected Groundwater Production	1,600	1,600	1,600	1,600	1,600
% of Total Water Supply	1%	1%	1%	1%	1%

### Temecula-Murrieta Supply Reliability

Water quality in the Temecula-Murrieta Basin is generally considered suitable for domestic and irrigation uses. Recently, arsenic concentrations have been increasing and certain wells will require treatment to meet drinking water MCLs. Rancho California Water District, based on the historic record of 1935 to 2005, considers this supply 100% reliable even in a single and multiple-dry year (RCWD 2005). To be conservative, Western is assuming its use of Temecula-Murrieta Basin water could be reduced by 15% in a single-dry or multiple dry year (see Table 3-10).

**Table 3-10  
Supply Reliability in Average, Single-Dry, and Multiple Dry Year  
- Temecula-Murrieta Groundwater (AF)**

Water Year Type	2015	2020	2025	2030	2035
Average Water Year	1,600	1,600	1,600	1,600	1,600
Single Dry Water Year	1,360	1,360	1,360	1,360	1,360
Multiple-Dry Water Year	1,360	1,360	1,360	1,360	1,360

### 3.3.3 Groundwater Banking, Riverside Corona Feeder and Seven Oaks Dam

The San Bernardino Basin Area (SBBA) was defined by and adjudicated by the *Western Judgment* in 1969. The SBBA has a surface area of approximately 140.6 square miles and lies between the San Andreas and San Jacinto faults. The basin is bordered on the northwest by the San Gabriel Mountains and Cucamonga fault zone; on the northeast by the San Bernardino Mountains and San Andreas fault zone; on the east by the Banning fault and Crafton Hills; and on the south by a low, east-facing escarpment of the San Jacinto fault and the San Timoteo Badlands. Alluvial fans extend from the base of the mountains and hills that surround the valley and coalesce to form a broad, sloping alluvial plain in the central part of the valley. The SBBA encompasses the Bunker Hill subbasin (8.02-06) defined by DWR and includes a small portion of the Yucaipa Basin and Rialto-Colton Basin. The SBBA also encompasses surface water from Mill Creek, Lytle Creek, and the Santa Ana River.

The *Western Judgment* established the natural safe yield of the SBBA to be a total of 232,100 AF per year for both surface water diversions and groundwater extractions (a copy of the Western Judgment is provided in Appendix G). Of this amount, agencies within Western are allocated 64,862 AFY (excluding any specific groundwater banking performed by Riverside county agencies). Each year the Western-San Bernardino Watermaster produces an annual report calculating the total extractions compared to the safe yield for the SBBA. The *Judgment* requires the annual determination of extractions from the SBBA. A comparison for a 5-year period of annual extractions and recharge provides the basis for the accounting of any credits or replenishment obligations. Western can acquire credits when groundwater extractions by Western and its member agencies are less than the combination of the allowable extraction (64,862 AF) and any groundwater replenishment. Western acquires a recharge obligation or losses credits in those years when extractions by Western and its member agencies exceed the combination of the allowable extraction (64,862 AF) and any groundwater recharged. As of the accounting performed for the 2009 Annual Western-San Bernardino Watermaster Report, Western has 5,888 AF of credit accumulated in the SBBA.

Western intends to utilize excess water, when available, and store this water in the SBBA. This water will come from two different projects - Santa Ana River water rights and the Riverside Corona Feeder. This water would be extracted as needed, and transported to Western's customers and other water purveyors within Western's boundaries for use during dry years. These two projects are discussed below. Currently Western has 6,000 AF of banked groundwater. Modeling indicates that, conservatively, Western could have 15,000 AF of water banked in most years. This banked water would only be used when needed during drought or water shortage periods.

### **Santa Ana River Water Rights**

Western, along with San Bernardino Valley Municipal Water District, jointly filed two applications with the State Water Resources Control Board to appropriate water from the Santa Ana River, made available through the construction of Seven Oaks Dam. A permit to begin diversion of Santa Ana River water was issued by the State Water Resources Control Board in July 2010. It is estimated that up to 200,000 AF could be available in very wet years, but the annual average is between 10,000 to 27,000 AF, with Western's portion being 27.95% or 2,795 to 7,546 AF. The proposed project has the following main components: (i) the direct diversion of water from the Santa Ana River, (ii) the storage of water in Seven Oaks Reservoir, (iii) the use of existing facilities (generally pipelines and surface water storage facilities but including the use of underground storage basins), and (iv) the construction of various conveyance facilities (generally pipelines) to move water from the Santa Ana River and Seven Oaks Reservoir to retail purveyors or to underground storage basins and surface storage facilities. Western's share of this water supply would be placed in the SBBA for the benefit of Western's member agencies, to enhance groundwater storage, or sent to the Western service area via the future Riverside Corona Feeder. With existing facilities, it is assumed that about 1,000 AFY on average (279 AFY for Western) can be captured and utilized. As additional facilities are constructed, water available to Western will increase. Estimates of yield have been derived from modeling prepared as part of Valley District and Western's water rights application to the State Water Resources Control Board (Valley District/Western 2007).

## Riverside-Corona Feeder

The Riverside Corona Feeder is a planned regional conveyance facility, comprised of up to 20 wells and 28 miles of pipeline capable of moving up to 40,000 acre feet per year of groundwater previously banked in the SBBA. The Riverside-Corona Feeder will originate in the SBBA area in San Bernardino County (near the southern portion of the City of San Bernardino) and extend southwesterly to the City of Corona. The Riverside-Corona Feeder will make it possible for Western to store excess stormwater, excess SWP water, and Santa Ana River water in the SBBA.

### 3.4 RECYCLED WATER OPPORTUNITIES

Chapter 4 of this UWMP describes existing and future recycled water production and use by Western. Table 3-11 below provides estimates of recycled water supply based on existing recycled water production capacity and existing recycled water demand. As described in section 3.6.4, Western is planning to expand recycled water production. Recycled water is considered a “drought-proof” supply.

**Table 3-11**  
**Recycled Water Production and Use (AF)**

Water Year Type	2015	2020	2025	2030	2035
Average Water Year	950	950	950	950	950
Single-Dry Year	950	950	950	950	950
Multiple Dry Year	950	950	950	950	950

### 3.5 TRANSFERS AND EXCHANGES

Western’s planned long-term purchases of Meeks and Daley Water from Elsinore Valley Municipal Water District and purchases of water from the City of Riverside were described in section 3.2.2 above.

### 3.6 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS

#### 3.6.1 Perris North Subbasin

The Perris North Subbasin is part of the San Jacinto Groundwater Basin (DWR 8-05) which underlies the San Jacinto, Perris, Moreno, and Menifee Valleys in western Riverside County. This basin is bounded by the San Jacinto Mountains on the east, the San Timoteo Badlands on the northeast, the Box Mountains on the north, the Santa Rosa Hills and Bell Mountain on the south, and unnamed hills on the west. The valleys are drained by the San Jacinto River and its tributaries (MWD 2007). Groundwater occurrence in the West San Jacinto Basins is generally within unconfined alluvium. Groundwater depth within the Perris North Basin is approximately 850 feet.

The West San Jacinto Basins are managed by Eastern MWD under the authority of the West San Jacinto Groundwater Basin Management Plan (Management Plan), which was cooperatively developed and adopted in 1995 under Assembly Bill 3030. Elements of the Management Plan include: artificial recharge, recovery of degraded groundwater to be blended with imported water, recovery of brackish water using demineralization treatment technologies, conjunctive use, and agricultural groundwater exchange.

The Management Plan also established an advisory committee that oversees management activities in the basin. Advisory committee members include the Nuevo Water Company, the cities of Moreno Valley and Perris, the McCanna Ranch Water Company, and two elected representatives from the private water producers. Depending on groundwater levels, groundwater may flow between the Hemet-San Jacinto Basins to the east and southeast. This basin interaction primarily occurs between the San Jacinto Lower Pressure subbasin and the Lakeview subbasin of the West San Jacinto Basins and the San Jacinto Upper Pressure and Hemet North subbasins of the Hemet-San Jacinto Basins to the south. Flow can also occur between the Perris South and Menifee subbasins and the Hemet South subbasin of the Hemet San Jacinto Basins to the east. These flows are not regulated and there are no formal agreements regarding these flows.

In 2008 Eastern Municipal Water District (EMWD) and Western entered into an agreement to perform an initial feasibility study to analyze potential groundwater development opportunities in and around March Air Reserve Base (MARB) which overlies the Perris North Subbasin. Use of additional groundwater resources in this area will provide additional potable water supplies to EMWD and WMWD while helping address rising groundwater levels at MARB. This study found that additional groundwater development potential exists both north and east of the base and is on the order of 2,000 to 4,000 AFY. Four potential production well locations were identified and evaluated; individual well yields are expected to range from 400 GPM to possibly up to 1,000 GPM. Wellhead treatment for removal of volatile organics is expected to be required. Table 3-12 shows Western's planned water supplies from the Perris North Subbasin.

**Table 3-12**  
**Projected Groundwater Production - Perris North Subbasin (AF)**

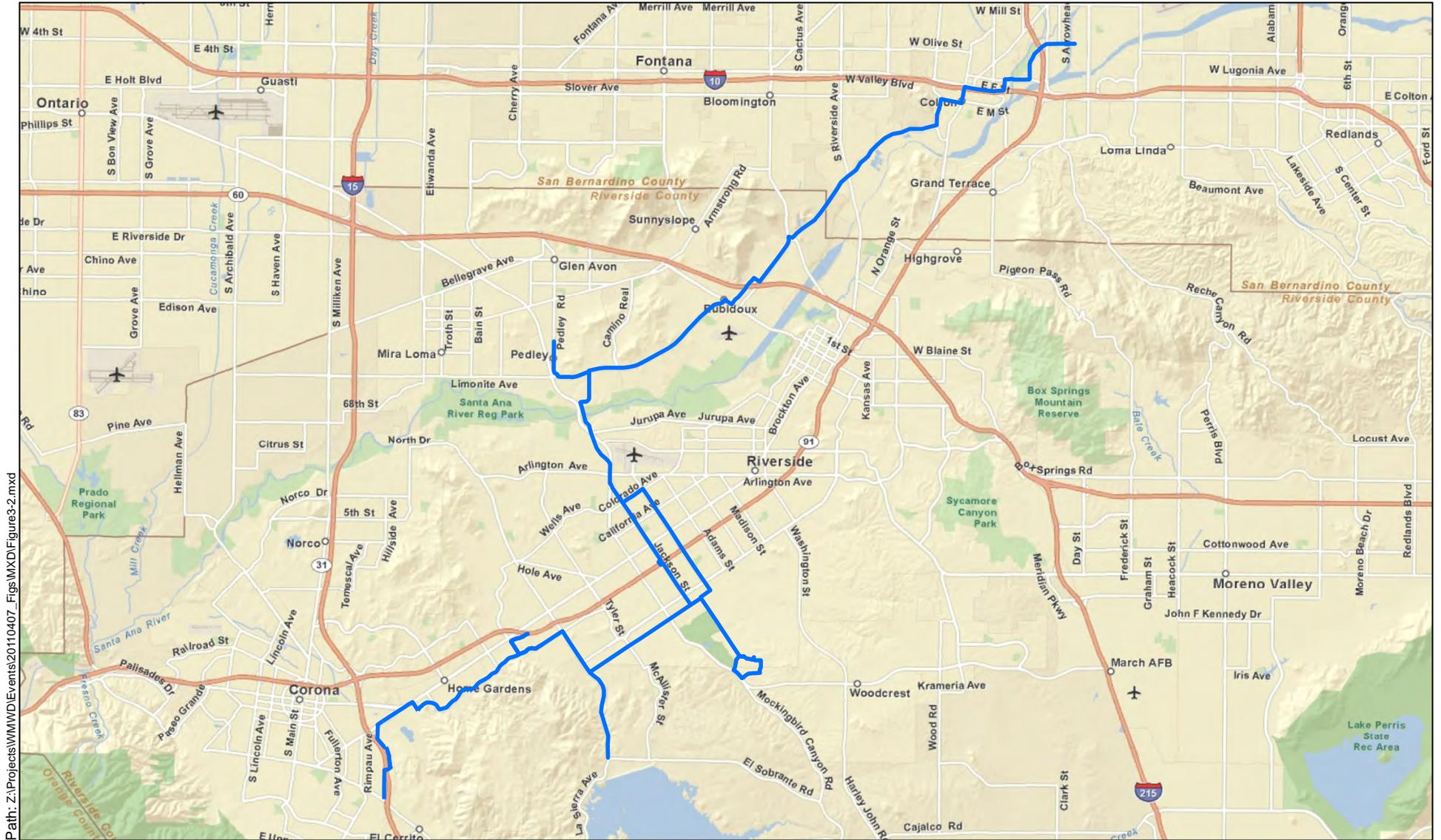
	2015	2020	2025	2030	2035
Groundwater Production	1,000	2,000	2,000	2,000	2,000

### 3.6.2 Arlington Desalter Expansion

The current capacity of the Arlington Desalter is 5 million gallons per day (mgd) of RO permeate and approximately 1.3 mgd of untreated bypass for a total product water capacity of 6.3 mgd. Western has performed feasibility studies and design needed to expand the Arlington Desalter. The expansion of the Arlington Desalter will result from a combination of improved treatment efficiency and new raw water wells, specifically:

- Fixed bed (FXB) biode-nitrification for RO bypass nitrate removal.
- New raw water wells
- New recharge basins.

Western anticipates these improvements will result in additional product water from the Arlington Desalter, 850 AFY, by year 2015.

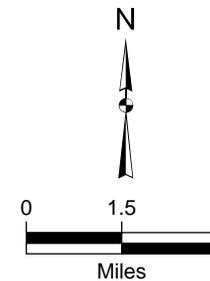


Path: Z:\Projects\WMD\Events\20110407\_Figs\MXD\Figure3-2.mxd

Image Source: ESRI

**Legend**

 Riverside Corona Feeder



**Kennedy/Jenks Consultants**

Western Municipal Water District  
2010 Urban Water Management Plan

**Proposed Riverside Corona Feeder**

K/J 1089006\*00  
May 2011

**Figure 3-2**



### 3.6.3 Chino Desalter Expansion

Western will receive water from the Chino Groundwater Basin through its membership in the Chino Desalter Authority (CDA). The Chino Subbasin lies in the southwest corner of San Bernardino county. The Chino Subbasin is bordered to the east by the Rialto-Colton fault. In the other three directions, the Chino Subbasin is ringed by impermeable mountain rock, the San Gabriel Mountains to the north, the Jurupa Mountains and Puente Hills to the south and southwest. Average annual precipitation across the basin is 17 inches. This part of the San Bernardino Valley is drained by San Antonio Creek and Cucamonga Creek southerly to the Santa Ana River (DWR 2003).

On January 2, 1975, several Chino Basin producers filed suit in California State Superior Court for San Bernardino County (the "Court") to settle the problem of allocating water rights in the Chino Basin. On January 27, 1978, the Court entered a judgment in *Chino Basin Municipal Water District v. City of Chino et. al.* adjudicating water rights in the Chino Basin and establishing the Chino Basin Watermaster. The Judgment adjudicated all groundwater rights in Chino Basin and contains a physical solution to meet the requirements of water users having rights in or dependent upon the Chino Basin. The judgment also appointed the Watermaster to account for and implement the management of the Chino Basin. The Judgment declared that the initial operating safe yield of the Chino Basin is 145,000 acre feet per year. The Basin is managed through implementation of the Chino Optimum Basin Management Plan (Appendix G).

As part of the Optimum Basin Management Program, the Chino Basin stakeholders made a decision to install water treatment facilities in the southern portion of the basin to extract approximately 40,000 AFY of groundwater; treat it to potable water standards; and deliver the product water to member agencies of the CDA to meet drinking water supply requirements. Presently about 28,000 AFY of the 40,000 AFY is being extracted and treated at two desalter units, the Chino I Desalter and the Chino II Desalter. The desalters, their wellfields, and product water facilities are currently being expanded. Upon completion of the Chino Desalter Expansion, anticipated in the fall of 2014, Western will receive 3,500 AFY. Because this will be from a managed groundwater basin, it is assumed to be reliable in an average, single-dry, and multiple-dry year.

### 3.6.4 Western Water Recycling Facility Expansion

Chapter 4 of this UWMP describes existing and future recycled water production and use by Western. Table 3-13 below provides estimates of new, planned recycled water supply. Recycled water is considered a “drought-proof” supply.

**Table 3-13  
New Planned Recycled Water Production and Use (AF)**

<b>Water Year Type</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Average Water Year	170	730	1,290	2,410	3,530
Single-Dry Year	170	730	1,290	2,410	3,530
Multiple Dry Year	170	730	1,290	2,410	3,530

### **3.7 DEVELOPMENT OF DESALINATION**

#### **3.7.1 Opportunities for Brackish Water and/or Groundwater Desalination**

As described in sections 3.3.1, 3.6.2, and 3.6.3, Western is already pursuing the use of desalinated groundwater as part of its long-term water supply.

#### **3.7.2 Opportunities for Seawater Desalination**

Seawater desalination would require two major components:

- (1) The development or contribution to a seawater desalination facility and associated facilities (e.g., brine disposal facility); and
- (2) The exchange of an amount of desalted water for SWP supplies.

The development of (or participation in) a new water supply using a seawater desalination technique, while costly, is being investigated by other wholesale and retail water agencies in southern California. Because Western is an inland area, in order for desalination to work it would be necessary for Western to join with other water purveyors in the development of a coastal desalination facility and then receive water from the SWP supplies of other participants via an exchange. It is not cost effective nor environmentally sound for Western to receive direct delivery of desalted ocean water.

Seawater desalination is an alternative that is technically viable. However, production and treatment costs have historically been several times higher than those of SWP costs and conventional treatment. The Municipal Water District of Orange County has estimated that ocean desalination will cost \$1,300 per AF (May 2010), not including treatment, conveyance, and storage costs. This cost is nearly double that of a like amount of imported water from MWD (currently \$744 per AF for fully treated water).

### **3.8 ANTICIPATED REGIONAL WATER SUPPLY SOURCES IN NORMAL, DRY, AND MULTIPLE DRY YEARS**

Tables 3-14, 3-15, and 3-16 provide details on anticipated supplies available to Western in an average, dry, and multiple dry year periods.

**Table 3-14  
Water Supply - Average Year (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies</b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,600	1,600	1,600	1,600	1,600	1,600
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,463</b>	<b>204,277</b>	<b>214,281</b>	<b>225,451</b>	<b>238,185</b>	<b>238,185</b>
<b>Planned Supplies</b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,983</b>	<b>211,357</b>	<b>221,921</b>	<b>234,211</b>	<b>248,065</b>	<b>249,185</b>

**Table 3-15  
Water Supply - Single Dry Year (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,360	1,360	1,360	1,360	1,360	1,360
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,223</b>	<b>204,037</b>	<b>214,041</b>	<b>225,211</b>	<b>237,945</b>	<b>237,945</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,743</b>	<b>211,117</b>	<b>221,681</b>	<b>233,971</b>	<b>247,825</b>	<b>248,945</b>

**Table 3-16  
Water Supply - Multiple Dry Year (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,360	1,360	1,360	1,360	1,360	1,360
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,223</b>	<b>204,037</b>	<b>214,041</b>	<b>225,211</b>	<b>237,945</b>	<b>237,945</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,743</b>	<b>211,117</b>	<b>221,681</b>	<b>233,971</b>	<b>247,825</b>	<b>248,945</b>



# Chapter 4.0 RECYCLED WATER

## 4.1 OVERVIEW

This section describes recycled water production and use by Western. There are multiple recycled water projects undertaken by individual member agencies, but these are not described in this chapter. For information on these recycled water programs the reader should refer to the UWMPs of Western’s member agencies.

## 4.2 RECYCLED WATER MASTER PLAN

In July 2008 Western adopted its “Western Strategic Plan” to respond to on-going water resource issues in southern California. Out of seven policy statements developed in the plan, Policy 1 is to “Implement a diversified water supply portfolio in the region.” A key action item for this policy is full utilization of the recycled water produced in Western’s retail and/or wholesale areas and to dramatically reduce the use of potable water for outdoor areas. In December 2009 Western prepared a Recycled Water Master Plan. As shown in Table 4-1 below, multiple agencies were contacted to provide input to the plan. A copy of the Recycled Water Master Plan is provided in Appendix E.

**Table 4-1  
Recycled Water Plan Participating Agencies**

Participating Agencies	Role in Plan Development
Riverside Public Utilities	Contacted to determine potential recycled water demands in service area. Contacted to determine potential surplus raw wastewater water which could be used to create recycled water for the Western retail area.
<i>Gage Canal Company</i>	Contacted to determine potential recycled water demands in service area
Riverside Unified School District	Contacted to determine potential recycled water demands in service area

## 4.3 POTENTIAL SOURCES OF RECYCLED WASTEWATER

### 4.3.1 Wastewater Treatment Facilities

This section describes the wastewater treatment system in the service area, including any planned improvements and expansions as well as wastewater collected and treated in Western’s retail service area.

Western’s Riverside retail service area receives wastewater treatment services from:

- the Western Riverside County Regional Wastewater Treatment Plant (WRCRWTP) operated by Western;
- the Western Water Recycling Facility (formerly the March Wastewater Treatment Plan) operated by Western;
- the City of Riverside at the Riverside Water Quality Control Plant; and

- individual septic treatment systems.

Wastewater treatment in the Western's other retail areas is provided by Eastern Municipal Water District at the Temecula Valley Regional Water Reclamation Facility and Rancho California Water District at the Santa Rosa Water Reclamation Facility. Both Eastern Municipal Water District and Rancho California Water already utilize flows from their wastewater plants to create recycled water. Because these facilities already produce recycled water, flows to these two plants do not have the potential to provide additional recycled water and are not discussed further. Likewise, development of recycled water from the City of Riverside's Water Quality Control Plant is being undertaken by the City of Riverside. This limits the potential for recycled water development by Western to Western's two wastewater treatment plants.

The WRCRWTP plant, a tertiary facility capable of providing reclamation water for reuse or for discharge through an outfall to the Santa Ana River, was brought online in 1998. It has a current design capacity of eight MGD with the capability for expansion to 32 MGD. This facility performs high levels of treatment through a number of consecutive wastewater treatment processes. Wastewater from Western's retail customers, the City of Norco, Jurupa Community Services District and Home Gardens Sanitary District is collected through many miles of pipelines, pumped to the treatment plant, processed and discharged into the Santa Ana River. The average flow into the plant in December 2010 was 6.6 MGD and on some storm days flows were nearly 8 MGD. There are plans to expand the WRCRWTP. Currently the plant treats and discharges approximately 5,000 AFY to the Santa Ana River (SAWPA 2010). Treated wastewater discharged into the Santa Ana River in San Bernardino and Riverside Counties, such as that from the WRCRWTP is subsequently put to use by Orange County Water District. Except during periods of high storm flow, Orange County Water District recharges all the flow in the Santa Ana River using surface recharge basins in Anaheim and Orange. The WRCRWTP is in the final planning stages of providing recycled water to the City of Norco. To date, seven miles of recycled water pipeline, a small reservoir, and a pump station have been installed. In the near future the City of Norco is anticipated to take delivery of up to 895 AFY of recycled water.

Western Water Recycling Facility treats domestic wastewater from March Air Reserve Base and the north central portion of the Riverside service area. Currently, the plant, produces about 850,000 gpd (approximately 1,000 AFY) of "secondary" treated wastewater which is discharged to an impoundment and then pumped to supply recycled water to the Riverside National Cemetery and General Old Golf Course, which are currently the only users of recycled water from the Plant (SAWPA 2010, Western 2009). When supply exceeds demand, such as during wet winter months, the recycled water is stored in the on-site impoundment until needed. If there is a large discrepancy between recycled water demand and recycled water supply, excess recycled water from the Western Water Recycling Facility can be placed in Western's existing sewer collection system for conveyance and treatment at the WRCRWTP and is eventually discharged to the Santa Ana River.

Currently, use of the Western Water Recycling Facility is somewhat limited by influent to the plant and nearby demand for recycled water. However, Western recently completed improvements to the plant to allow treatment up to a tertiary level and to increase capacity to 3 MGD. The purpose of the expansion is to serve new residential development to the west of the

facility and a major industrial development to the north. At maximum capacity the existing facility could generate over 3,360 AFY of tertiary treated wastewater to Western's non-potable distribution system. The amount of influent to the Western Water Recycling Facility and new demand for recycled water is dependent on new development in the Riverside service area. Table 4-2 illustrates the anticipated treatment capacity and Average Daily Flow for the Western Water Recycling Facility. Table 4-2 is based on data provided in Western's Recycled Water Master Plan. However, the timeframes originally provided in the Recycled Water Master Plan have been revised as development has slowed. Influent wastewater increases are directly dependent on growth and projected development estimates have been tempered.

**Table 4-2  
Western Water Recycling Facility Wastewater Treatment Capacity and Anticipated Volumes**

Year	Treatment Capacity (MGD)			Anticipated Average Daily Flow (MGD)		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
2010	1	1	0	0.85	0.85	0
2015	3	3	3	1	1	1
2020	3	3	3	1.5	1.5	1.5
2025	3	3	3	2	2	2
2030	5	5	5	3	3	3
2035	5	5	5	4	4	4

*Source: Western 2009.*

## 4.4 RECYCLED WATER DEMAND

### 4.4.1 Current Use

Currently Western delivers secondary treated wastewater, approximately 788 AFY to Riverside National Cemetery and the General Old Golf course. In 2005 Western delivered approximately 450 AFY of secondary treated wastewater.

### 4.4.2 Potential Users

In addition to future sales of recycled water to the City of Norco (which is outside of Western's retail service area), Western has identified over 5,500 AFY of potential new recycled water demand in the vicinity of the Western Water Recycling Facility from existing non-potable water customers. However that represents the greatest potential demand. Western also examined existing non-potable water customers in the retail area who consumed more than 40 AFY. The analysis was limited to larger (40 AFY or larger) consumers due to the cost of extending recycled water lines and because maintaining a recycled water system requires some customer sophistication. Western identified approximately 2,500 AF of demand from existing larger non-potable customers. Future development is anticipated to bring another 2,150 AF of recycled water demand. In total, existing and future recycled water demand is anticipated to be nearly 5,000 AFY (Western 2009). Table 4-3 provides estimates of recycled water by customer type, both existing and future. Table 4-4 provides projections of recycled water production and use. For the purposes of estimating potential recycled water supply, the estimated supply is set at the smaller of either the available production or the anticipated recycled water demand.

**Table 4-3**  
**Estimates of Recycled Water Demand by Customer Type - Western Retail**  
**Service Area (AFY)**

<b>Type of Use</b>	<b>Existing Potential Recycled Water Demand</b>	<b>Future Recycled Water Demand</b>	<b>Total</b>
Agriculture	1,495	0	1,495
Industrial	110	0	110
Landscape	1,181	2,157	3,338
<i>Total</i>	2,786	2,157	4,943
<i>Source: Western 2009.</i>			

**Table 4-4**  
**Estimates of Recycled Water Demand and Production by Year (AFY)**

<b>Year</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Projected Recycled Water Production	1,120	1,680	2,240	3,360	4,480
Projected Recycled Water Demand	800	1,890	2,700	3,510	4,943

Western has been working with commercial, residential, and institutional developments in the retail area to insure that recycled water can be used to the fullest extent possible. One major commercial area (Meridian Business Center) and one large residential community already are dual-piped for recycled water use. Three Riverside Unified School District (RUSD) and one Val Verde Unified School District schools have been plumbed and/or retrofitted to use recycled water. All new residential projects will be conditioned to install dual plumbing. Western will continue to work with the RUSD to dual plumb new campuses.

### **Incentives for Recycled Water Use**

The primary means by which Western encourages recycled water use is through their water rate structure. Non-potable and recycled water customer rates are approximately 15% less than potable water. In addition, recycled water use is mandated by Ordinance 377 in those areas where recycled water is available and can be properly used. Industrial/commercial developers near non-potable distribution pipelines are required to plan for the future use of recycled water. This includes installing of proper piping and facilities to minimize economic impacts when recycled water becomes available at the use site. This is being implemented through the plan check process, with plans not approved until required recycled water facilities are designed. These actions will create a recycled water market in the Western area, but no estimate of the amount of additional recycled water use that will result is available.

### **Plan for Optimizing the Use of Recycled Water**

In addition to preparing the Recycled Water Master Plan, Western is working closely with other agencies in both its retail and wholesale service areas to identify and implement projects to optimize recycled water use:

- Western and the City of Riverside currently are conducting joint planning for potential recycled water use. The intent is to maximize use of recycled/non-potable water in the City of Riverside’s greenbelt area that will take advantage of elevation differences, thus reducing energy (pumping) costs. The system also will distribute non-potable groundwater through the legacy canal system thereby maximizing use of local water resources.
- Western is engaged in a planning effort with the Riverside County Ben Clark Training Center to potentially site a large recycled water storage impoundment on their facility located just south of Van Buren Boulevard and west of I-215. This proposed 600 AF impoundment would serve the County as a dive/water training facility while providing wet weather storage for recycled water produced by the Western Water Recycling Facility, a truly unique and innovative use of recycled water.
- Western is in the early stages of evaluating the use of recycled water to recharge local groundwater basins as a new source of supply. As total summer irrigation demands likely will exceed recycled water supply, recharge will probably be limited to winter months. Close coordination with the Regional Water Quality Control Board and California Department of Public Health will be required.



## **Chapter 5.0**

# **RELIABILITY PLANNING**

### **5.1 OVERVIEW**

The UWMP Act requires urban water suppliers assess water supply reliability by comparing total projected water use with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment of single-dry year and multiple-dry years. Western has elected to evaluate water supplies and demands for a 25-year period as well as anticipated conditions once the service area is fully developed. This section presents the reliability assessment for Western's service area.

### **5.2 NORMAL, SINGLE-DRY, AND MULTIPLE-DRY YEAR PLANNING**

#### **5.2.1 Normal Water Year**

The Normal/Average year is a year in the historical sequence that most closely represents median runoff levels and patterns (for more information refer to sections 3.2, 3.3, 3.4, and 3.6). This section summarizes Western's water supplies available to meet demands over the 25-year planning period during an average/normal year and compares them to demands for the same period. In Table 5-1, below, demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. Assumptions about supplies and demands are provided in section 2.4 and 3.8. Table 5-1 demonstrates that Western anticipates adequate supplies for years 2015 to 2035 under Normal conditions.

#### **5.2.2 Single-Dry Year**

The single-dry year is generally the lowest annual runoff for a water source in the record. The single-dry year may differ for various sources (for more information refer to sections 3.2, 3.3, 3.4, and 3.6). This section summarizes Western's water supplies available to meet demands over a 25-year planning period during a single-dry year and compares them to demands for the same period. In Table 5-2, below, demands are assumed to be 13 percent greater in a single-dry year than during a normal year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. Table 5-2 demonstrates that Western anticipates adequate supplies for years 2015 to 2035 under single-dry year conditions.

#### **5.2.3 Multiple-Dry Years**

The multiple-dry year is generally the lowest annual runoff for a three year or more consecutive period. The multiple-dry year period may differ for various sources (for more information refer to sections 3.2, 3.3, 3.4, and 3.6). This section summarizes Western's water supplies available to meet demands over a 25-year planning period during a multiple-dry year period and compares them to demands for the same time frame. In Table 5-3, below, demands are assumed to be 13 percent greater in a multiple-dry year than during an average year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. Table 5-3 demonstrates that Western anticipates adequate supplies for years 2015 to 2035 under multiple-dry year conditions.

**Table 5-1  
Projected Average/Normal Year Supplies and Demands (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,600	1,600	1,600	1,600	1,600	1,600
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,463</b>	<b>204,277</b>	<b>214,281</b>	<b>225,451</b>	<b>238,185</b>	<b>238,185</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,983</b>	<b>211,357</b>	<b>221,921</b>	<b>234,211</b>	<b>248,065</b>	<b>249,185</b>
Demands without Additional Conservation <sup>2</sup>	129,661	149,565	162,209	174,651	187,827	202,254
Conservation	11,021	21,685	23,227	24,728	26,377	28,275
Total Adjusted Demands <sup>2</sup>	118,640	124,042	134,684	145,164	156,231	168,300
<b>Surplus/Deficit in Normal Year</b>	<b>68,343</b>	<b>87,315</b>	<b>87,237</b>	<b>89,047</b>	<b>91,834</b>	<b>80,885</b>
<b>Difference as % of Supply</b>	<b>37%</b>	<b>41%</b>	<b>39%</b>	<b>38%</b>	<b>37%</b>	<b>32%</b>
<b>Difference as % of Demand</b>	<b>58%</b>	<b>70%</b>	<b>65%</b>	<b>61%</b>	<b>59%</b>	<b>48%</b>
1 From Table 3-1						
2 From Table 2-12, 2-13, 2-14, and 2-15.						

**Table 5-2  
Projected Single-Dry Year Supplies and Demands (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,360	1,360	1,360	1,360	1,360	1,360
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,223</b>	<b>204,037</b>	<b>214,041</b>	<b>225,211</b>	<b>237,945</b>	<b>237,945</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,743</b>	<b>211,117</b>	<b>221,681</b>	<b>233,971</b>	<b>247,825</b>	<b>248,945</b>
Demands without Additional Conservation <sup>2,3</sup>	146,516	169,008	183,296	197,355	212,244	228,547
Conservation	12,453	28,841	31,103	33,320	35,703	38,368
Total Adjusted Demands <sup>2,3</sup>	134,063	140,167	152,193	164,035	176,542	190,179
<b>Surplus/Deficit in Single-Year</b>	<b>52,680</b>	<b>70,950</b>	<b>69,488</b>	<b>69,936</b>	<b>71,283</b>	<b>58,766</b>
<b>Difference as % of Supply</b>	<b>28%</b>	<b>34%</b>	<b>31%</b>	<b>30%</b>	<b>29%</b>	<b>24%</b>
<b>Difference as % of Demand</b>	<b>39%</b>	<b>51%</b>	<b>46%</b>	<b>43%</b>	<b>40%</b>	<b>31%</b>
1 From Table 3-15						
2 From Table 2-12, 2-13, 2-14, and 2-15.						
3 Demands in dry periods anticipated to be 13% higher than in Average year.						

**Table 5-3  
Projected Multiple-Dry Year Supplies and Demands (AF)**

<b>Water Supply Sources</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>Buildout</b>
<b>Existing Supplies<sup>1</sup></b>						
<b>Wholesale and Purchased</b>						
Metropolitan Water District (Imported)	160,313	174,127	184,131	195,301	208,035	208,035
Metropolitan Water District Ag Water Purchase	0	0	0	0	0	0
Meeks and Daley Purchase	4,200	4,200	4,200	4,200	4,200	4,200
City of Riverside (non-potable)	2,000	2,000	2,000	2,000	2,000	2,000
<b>Local Supplies</b>						
Arlington Desalter	6,400	6,400	6,400	6,400	6,400	6,400
Chino Desalters	0	0	0	0	0	0
Groundwater Murrieta Basin	1,360	1,360	1,360	1,360	1,360	1,360
Western Water Recycling Facility	950	950	950	950	950	950
<b>Banking Programs</b>						
San Bernardino Basin Area	6,000	15,000	15,000	15,000	15,000	15,000
<b>Total Existing Supplies</b>	<b>181,223</b>	<b>204,037</b>	<b>214,041</b>	<b>225,211</b>	<b>237,945</b>	<b>237,945</b>
<b>Planned Supplies<sup>1</sup></b>						
<b>Local Supplies</b>						
Perris North Groundwater Basin	1,000	2,000	2,000	2,000	2,000	2,000
Arlington Desalter Expansion	850	850	850	850	850	850
Chino Desalters Expansion	3,500	3,500	3,500	3,500	3,500	3,500
Western Water Recycling Facility Expansion	170	730	1,290	2,410	3,530	4,650
<b>Total Planned Supplies</b>	<b>5,520</b>	<b>7,080</b>	<b>7,640</b>	<b>8,760</b>	<b>9,880</b>	<b>11,000</b>
<b>Total Existing and Planned Supplies</b>	<b>186,743</b>	<b>211,117</b>	<b>221,681</b>	<b>233,971</b>	<b>247,825</b>	<b>248,945</b>
Demands without Additional Conservation <sup>2,3</sup>	146,516	169,008	183,296	197,355	212,244	228,547
Conservation	12,453	28,841	31,103	33,320	35,703	38,368
Total Adjusted Demands <sup>2,3</sup>	134,063	140,167	152,193	164,035	176,542	190,179
<b>Surplus/Deficit in Multiple-Dry Year</b>	<b>52,680</b>	<b>70,950</b>	<b>69,488</b>	<b>69,936</b>	<b>71,283</b>	<b>58,766</b>
<b>Difference as % of Supply</b>	<b>28%</b>	<b>34%</b>	<b>31%</b>	<b>30%</b>	<b>29%</b>	<b>24%</b>
<b>Difference as % of Demand</b>	<b>39%</b>	<b>51%</b>	<b>46%</b>	<b>43%</b>	<b>40%</b>	<b>31%</b>
1 From Table 3-16						
2 From Table 2-12, 2-13, 2-14, and 2-15.						
3 Demands in dry periods anticipated to be 13% higher than in Average year.						

## **Chapter 6.0**

# **WATER SHORTAGE CONTINGENCY PLANNING**

### **6.1 OVERVIEW**

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought which limits supplies, an earthquake which damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. As both a wholesale and retail water agency, Western has produced plans to address water supply reductions to member agencies, as well as to individual meter customers. This chapter of the Plan describes how Western plans to respond to various stages of water supply shortages within its wholesale and retail service areas.

To date, both a Water Conservation and Supply Shortage Program (WCSSP) and a Drought Allocation Plan (DAP) have been prepared by Western in conjunction with its retail agencies. The DAP provides Western and its wholesale customers with a means of allocating limited imported water supplies from MWD under shortage conditions. Within Western's retail service jurisdiction, the WCSSP describes six stages of water supply shortages and provides a set of strategies to ensure that water is beneficially used at the customer level. The DAP and WCSSP, and adoption ordinances, are provided in Appendix D.

### **6.2 COORDINATED PLANNING**

In February of 2008, MWD adopted a Drought Shortage Allocation Plan (Allocation Plan). MWD developed the Allocation Plan in response to recent drought conditions and the Court's ruling early in the year restricting the amount of water imported from Northern California, and thus potentially impacting the amount of water MWD has available to its member agencies. The plan would be implemented if current water shortages necessitate rationing. The overall guiding principle of the Allocation Plan is to alleviate disparate impacts at the retail level for its 26 member agencies. The plan incorporates considerations for impact on retail customers and the economy, changes and losses in local supplies, the investment in and development of local resources, and conservation achievements. The plan also serves as the final piece of Metropolitan's 1999 Water Surplus and Drought Management Plan, which originally did not include an allocation plan. Under the plan, MWD's member agencies and their retailers would be allocated supplies partly based on their dependency on MWD, while taking into account other local sources of supply.

The plan relies on tiered pricing to encourage agencies to reach their targeted allocated supplies. These "penalty rates" are similar to drought pricing used in many cities during the 1987-92 drought, calling for agencies to pay up to four times MWD's highest priced water, depending on how far they exceed their allocation. Any funds collected through penalty rates will be applied toward investments in conservation and local resources development.

As a member agency of MWD, Western developed its DAP in order to establish allocation guidelines for its own sub-agencies in the event that the MWD Allocation Plan is implemented in a shortage year. Preparation and implementation of a DAP for the Western service area required the input and support from the Western's wholesale customers. Recognizing the importance of wholesale customer involvement, Western created a Drought Allocation Plan

Workgroup, made up of staff from Western and its wholesale customers. Western hosted a series of three workshops for the Workgroup to obtain input on development of the DAP. All wholesale customers and their sub-agencies were invited to participate in these workshops. In addition, a web-based questionnaire was distributed to the sub-agencies in order to gather their input. Through this collaborative effort, the DAP was developed as an equitable means of apportioning imported supplies during periods when MWD implements its Allocation Plan.

## 6.3 WHOLESALE AREA SHORTAGE RESPONSE

### 6.3.1 Stages of Action to Respond to Water Shortages

The DAP establishes the method that will be used to allocate limited imported water supplies among Western's wholesale customers if MWD implements its Allocation Plan. The DAP establishes water allocations based on a number of variables including available supplies, base period demand, conservation, growth, regional shortage, retail agency dependence on imported supplies, and conservation demand hardening. The allocation method was designed to be equitable on the wholesale level, while helping to minimize hardships experienced by individuals and by the regional economy at the retail level. Table 6-1 below shows the different levels of shortages and the corresponding minimum wholesale allocation values as a percent of agency base wholesale demand. Note that these are minimum levels, and that exact allocations can be greater depending on the variables mentioned above.

**Table 6-1  
Wholesale Supply Shortages and Conditions**

Regional Shortage Level	Regional Shortage Percentage	Wholesale Minimum Allocation
1	5%	92.50%
2	10%	85%
3	15%	77.50%
4	20%	70%
5	25%	62.50%
6	30%	55%
7	35%	47.50%
8	40%	40%
9	45%	32.50%
10	50%	25%

Source: WMWD Drought Allocation Plan, 2008.

The DAP does not prescribe how the retail agencies reduce demands during shortage, rather the DAP incentivizes conservation through fees for excessive use. Western charges penalty rates for agencies that exceed their allocation under the DAP. The penalty rate schedule is designed to provide a significant incentive to stay within an agency's allocation, and also to cover any penalties that Western has to pay to MWD as a result of exceeding its allocation. The penalty

rate schedule is tiered in order to allow some overage, while still discouraging excessive use. Penalty rates are based on the official MWD water rates in effect, and are shown in table 6-2 below.

**Table 6-2  
Penalties for Excessive Use - Wholesale**

	Use Up to and Including	Base Water Rate	Penalty Rate	Total Rate
Above Allocation	> 100% to ≤ 110%	Tier 1	2 x Tier 2	Tier 1 + (2 x Tier 2)
	> 110%	Tier 1	4 x Tier 2	Tier 1 + (4 x Tier 2)
Within Allocation	> 100% to < 110%	Tier 1	2 x Tier 2	Tier 1 + (2 x Tier 2)

Source: WMWD Drought Allocation Plan, 2008.

## 6.4 RETAIL AREA SHORTAGE RESPONSE

### 6.4.1 Stages of Action to Respond to Water Shortages

On May 6, 2009, Western adopted Ordinance 374, establishing the WCSSP for its retail system. A draft resolution (included in Appendix D) has been prepared by Western to update the WCSSP. The program, as updated, describes five stages of water supply shortages and provides a set of strategies to ensure that water is beneficially used. Under normal supply conditions, the program also provides baseline water efficiency measures. The program's activation automatically enacted Stage 1 measures. Table 6-3 presents the six stage rationing and demand reduction goals for Western. The actions and strategies to reach these goals are described below.

**Table 6-3  
Rationing and Reduction Goals**

Stage	Supply Shortage	Demand Reduction Goal
1	Normal Supply	-
2	Minimal Shortage	6-10%
3	Modest Shortage	11-15%
4	Severe Shortage	16-25%
5	Critical Shortage	26-50%
6	Dire Shortage	50% or more

Source: WMWD Water Conservation and Supply Shortage Program, 2009 as updated by draft resolution (see Appendix D).

The WCSSP provides water use efficiency guidelines under various stages of water shortage for Western's retail customers. Water conservation Stage 1 is also referred to as a "Normal Supply" and is in effect at all times unless the Western Board of Directors otherwise declares that another water conservation stage is in effect. Stage 1 requires general water conservation practices. Each subsequent water conservation stage requires additional actions and reduction measures to address different levels of water shortage severity. For example, during Stage 3, Water Budgets for residential and dedicated landscape accounts will be implemented. In Stage 5, new water meters will not be approved, with some exceptions. In Stage 6, which is the most critical water

shortage stage, all landscape irrigation will be prohibited. Table 6-4 below shows the full list of water efficiency actions and reduction measures in each stage.

**Table 6-4  
Rationing and Reduction Goals**

Stage	Water Use Efficiency Actions and Reduction Measures
<p align="center">Stage 1: Normal Supply</p>	<ul style="list-style-type: none"> <li>• Landscape watering is prohibited on all days of the week from 8 a.m. to 8 p.m.</li> <li>• Eliminate run-off and over-spray.</li> <li>• Equip open hoses with automatic, positive shut-off nozzles.</li> <li>• All leaks, improperly adjusted sprinklers or other water conduits/fixtures that require repair shall be corrected within 96-hours of District notification.</li> <li>• No washing down sidewalks, driveways, patios or other paved or hard surface areas.</li> <li>• Make sure automatic irrigation timers are adjusted according to changing weather patterns and landscape requirements.</li> <li>• Construction operations receiving potable water from a construction meter for water trucks shall not use water for any purpose other than those required by regulatory agencies.</li> </ul>
<p align="center">Stage 2: Minimal Shortage</p>	<ul style="list-style-type: none"> <li>• All leaks, improperly adjusted sprinklers or other water conduits/fixtures that require repair shall be corrected within 72-hours of District notification.</li> <li>• Properties with odd number street addresses, parks, and public right-of-ways can irrigate landscaping only on Saturdays, Mondays, and Wednesdays.</li> <li>• Properties with even number street addresses can irrigate landscaping only on Sundays, Tuesdays, and Thursdays.</li> <li>• Limit pop-up spray-type sprinklers to a maximum of 15-minutes total run time on days of irrigation.</li> <li>• Limit impact, rotor and rotary-nozzle sprinklers to a maximum of 30-minutes total run time on days of irrigation.</li> <li>• Irrigation controllers that are certified by the Irrigation Association and Smart Water Application Technology and are registered with Western are exempt from run-time and irrigation day requirements during Stages 2 through 4, but not time of day requirements.</li> </ul> <p>Note: All Stage 1 efficiency measures remain in effect through Stage 2.</p>
<p align="center">Stage 3: Modest Shortage</p>	<ul style="list-style-type: none"> <li>• Western shall determine a Water Budget Allocation amount for each single family residential dwelling, multi family dwelling and each dedicated landscape customer based on specific water use needs, best management practices and efficient use.</li> <li>• Customers shall reduce their water use by 11 to 15% from Water Budget Allocation for the duration of Stage 3.</li> <li>• Landscape watering is prohibited on Mondays, Fridays.</li> <li>• Food service establishments are prohibited from providing drinking water to any person unless expressly requested.</li> <li>• Commercial lodging establishments shall provide customers the option of not having towels and linen laundered daily.</li> </ul> <p>Note: All Stage 1 through 2 efficiency measures remain in effect through Stage 3.</p>

**Table 6-4 cont.**

<b>Stage</b>	<b>Water Use Efficiency Actions and Reduction Measures</b>
<p>Stage 4: Severe Shortage</p>	<ul style="list-style-type: none"> <li>• Customers shall reduce their water use by 16% to 25% from the Water Budget Allocation for the duration of Stage 4.</li> <li>• Properties with odd number street addresses, parks, and public right-of-ways can irrigate landscaping only on Saturdays and Wednesdays.</li> <li>• Properties with even number street addresses can irrigate landscaping only on Sundays and Thursdays.</li> <li>• Washing automobiles, trucks, trailers, boats, and other types of vehicles, at any place except a commercial wash facility, is permitted only on Fridays, Saturdays, Sundays, and Mondays from 6 a.m. to 6 p.m., with a hand-held bucket or a hand-held hose equipped with an automatic, positive shut-off nozzle.</li> <li>• The operation of any ornamental fountain, pond, or similar structure is prohibited.</li> </ul> <p>Note: All Stage 1 through 3 efficiency measures remain in effect through Stage 4.</p>
<p>Stage 5: Critical Shortage</p>	<ul style="list-style-type: none"> <li>• Customers shall reduce their water use by 26-50% from the Water Budget Allocation for the duration of Stage 5.</li> <li>• Washing of cars, trucks, trailers, boats and other types of mobile equipment is permitted ONLY on the premises of a commercial car wash.</li> <li>• Properties with odd number street addresses, parks, and public right-of-ways can irrigate trees and shrubs only on Saturdays from 8 p.m. to 6 a.m.</li> <li>• Properties with even number street addresses may irrigate trees and shrubs only on Sundays from 8 p.m. to 6 a.m.</li> <li>• Irrigation Association certified "Smart" irrigation controllers are no longer exempted from staged water shortage requirements.</li> <li>• Provided the Board of Directors has declared a Water Shortage Emergency pursuant to California Water Code sections 350 et seq., the District shall not allow any new meters during Stage 5 (exceptions apply).</li> </ul> <p>Note: All Stage 1 through 4 efficiency measures remain in effect through Stage 5.</p>
<p>Stage 6: Dire Shortage</p>	<ul style="list-style-type: none"> <li>• Customers shall reduce their water use by 50% or more (as determined by the Board) from the Water Budget Allocation for the duration of Stage 6.</li> <li>• All outdoor watering and irrigation of lawns, ground cover and landscaping is prohibited.</li> <li>• Provided the Board of Directors has declared a Water Shortage Emergency pursuant to California Water Code sections 350 et seq., the District shall not allow any new connections to the water system during Stage 6.</li> </ul> <p>Note: All Stage 1 through 5 efficiency measures remain in effect through Stage 6.</p>
<p>Source: WMWD Water Conservation and Supply Shortage Program, 2009 as updated by draft resolution (see Appendix D).</p>	

**Penalties for Excessive Use**

Western implements a tiered-rate structure for its retail customers in order to promote conservation and discourage excessive use. Additionally, Western enforces penalties for violations of the water reduction measures in the WCSSP. Customers are notified of violations

twice before punitive fines are enforced. The penalties vary between \$100 per day to flow restriction or termination of service, and are based on the number of violations that occur, as well as the water shortage stage that is in effect at the time of violation. Table 6-5 below shows the full list of penalties for violations of the WCSSP measures.

**Table 6-5  
Retail Area Penalties for Violations**

<b>Violation</b>	<b>Less than 2-inches</b>	<b>2-inches and larger</b>
1st Violation	Written notice & door hanger	Written notice & door hanger
2nd Violation	Written notice & program summary	Written notice & program summary
3rd Violation (Stage 1 and 2)	\$100 per day	\$100 per day
3rd Violation (Stages 3 - 6)	\$200 per day	\$300 per day
4th Violation (Stage 1 and 2)	\$200 per day	\$300 per day
4th Violation (Stages 3 - 6)	\$400 per day	\$600 per day
5th & Subsequent Violations	Flow restriction & monetary penalty	Flow restriction, termination & monetary penalty
Source: WMWD Water Conservation and Supply Shortage Program, 2009.		

#### **6.4.2 Actions to Prepare for Catastrophic Interruption**

Western participated in the Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) for the Riverside Operational Area (County of Riverside 2005) to identify and plan for local hazards. Identified hazards include earthquakes, flooding, hazardous, material incidents, power losses, extreme weather, and terrorism. Using knowledge gained through the LHMP, Western then prepared its Emergency Response and Recovery Plan (Western 2005). This document is designed to prepare Western for a planned response to emergency situations associated with natural disasters, technological incidents, and national security emergencies in, or affecting, a water/ wastewater utility facility and its service area. This plan describes the following:

- Western’s emergency management organization required to assist in mitigating any significant emergency or disaster.
- Authorities, policies, responsibilities, and procedures required to protect the health and safety of customers, personnel, and facility property.
- Operational concepts and procedures associated with field response to emergencies, Emergency Operations Center (EOC) activities, and the recovery process.
- Implementation of the Standardized Emergency Management System (SEMS) for use within Riverside County operational area, regional, and state systems.

- Multi-agency and multi-jurisdictional coordination, particularly between Western and local, state, and federal agencies during emergency operations.

Western’s Emergency Response and Recovery Plan is compliant with SEMS (Government Code Section 8607) and should be used in conjunction with the State Emergency Plan and local emergency plans.

To manage water supply concerns during catastrophes, Western will isolate areas that will take the longest to restore to service and work with local government and MWD to provide alternate water supplies. The Office of Emergency Services has developed a guidance document entitled *Multi-Agency Emergency Response Procedures for Potable Water Procurement and Distribution* to assist water utilities and local governments in meeting the requirement to provide water to the public, and Western will work with this Agency to provide the public with potable water.

In general to manage catastrophes, Western will:

- Set priorities on repair work.
- Plan to restore service area by area.
- Get input from the emergency operations center on essential uses.
- Consider feeder lines.
- Keep in mind the need for firefighting water.
- Request mutual aid/assistance if the needed repairs exceed Western’s ability to complete repairs in a timely manner.
- The public will be kept informed through activating Western’s Water Service Emergency Notification Plan.

Table 6-6 provides details about specific actions for different types of supply shortages.

**Table 6-6  
Actions for Possible Supply Interruptions**

Possible Supply Interruption	Response
Regional power outage	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
Earthquake	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach; MWD to release from Emergency Storage as required.
Extreme Weather	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
Terrorism/Sabotage (including computer network)	Check for signs of contamination; Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
Water Borne Disease	Check for signs of contamination; Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
System Failure (HVAC and SCADA)	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach

In addition to response following an emergency, Western has taken steps to ensure system redundancy. Western has evaluated various supply sources available to both its wholesale and retail areas and has identified additional facilities and interconnections that will provide better access to a range of supplies (imported, groundwater) throughout the service area. Western currently has interconnections with City of Riverside and Elsinore Valley Municipal Water District that can be used during both normal and emergency operations. Western has an agreement and grant funding in place to develop an additional water connection with the City or Corona. In addition, Western is evaluating additional interconnections between its various supply sources and the City of Riverside to further improve access to supplies.

MWD has also prepared plans to safeguard from a catastrophic loss of water supply by developing emergency storage (MWD 2010a). MWD emergency storage requirements have been based on the potential for a major earthquake damaging aqueducts and causing supply interruptions through the aqueducts for six months. In this scenario, MWD would suspend interruptible service deliveries and firm supplies would be limited to 75% of normal-year demand levels. With only a few exceptions, the emergency supplies would be deliverable through gravity, reducing dependence on power sources.

## **6.5 FINANCIAL IMPACTS OF ACTIONS DURING SHORTAGES**

In the event of a water shortage, a three-point program (in order of preference) has been developed to meet the fiscal shortfall as a result of reduced water revenues:

- Reduce operation and maintenance expenses.
- Defer selected capital improvement projects until water shortage situation improves.
- Utilize the restricted capital reserve account for critical capital improvement projects needed to meet demands.

Consumption reduction will impact revenues by decreasing the amount of water sold to customers. Historically, the penalties for excess water use have encouraged conservation, thereby, reducing revenues from water sales. Generally, penalties provide only a very small amount of revenues. If the water shortage is deemed temporary, a rate increase may not be required. However, for long-term shortages, immediate rate increases would be considered. A consequence of rate increases may be further conservation by customers. Fixed domestic monthly service charges would not be expected to significantly change due to a water shortage. These charges would provide revenue for operational expenditures. Water shortages may also impact construction activities. A reduction in construction activities will reduce fees collected by Western such as water service connection fees, engineering services fees such as plan checking, and annexation fees. A summary of actions and conditions that impact revenues is provided below.

As consumption decreases, some expenditures are expected to increase. Staff costs for community education, enforcement of ordinances, monitoring and evaluation of water use, drought planning, and dealing with customer questions and complaints are expected to rise. If construction is drastically reduced, staff may not be required for certain functions, but it is

expected that the increased work load to deal with water shortage issues will more than offset the reduced work load for construction support. Table 6-7 summarizes potential impacts to revenues and expenditures related to water shortage.

**Table 6-7  
Revenue and Expenditure Impacts During Shortage**

Reduced Sales	Proportional to the decrease in water sales and are expected to range from 10 to 30%.
Reduced Construction	Reduction in fees collected during planning and construction activities.
Increase Staff Cost	Estimated at 5 to 15%
Increase O&M Cost	Estimated at 5 to 15%
Increase Cost of Supply	Temporary supplies at increase cost. MWD supply cost increase of 15%

Operations and maintenance costs may also increase because of the need to identify and quickly repair all water losses. Power costs may also increase if supplies from more energy intensive sources, such as the Arlington Desalter, must be used. MWD has adopted a policy to stabilize rates during water shortages, however, during recent supply shortages MWD rates have increased as much as 8% to 20% in a given year (MWD 2010b).

Western has developed reserve funds to sustain the revenue and expenditures impacts of a short-term water shortage. Reserve funds could be withdrawn for a 1 to 2 year period to cover the increased costs and reduced revenue. If the water shortage is long-term, rate increases are expected to be considered to mitigate the increased expenditures. Long-term water shortages may also require reducing capital expenditures by delaying projects for major facilities construction, upgrade or replacement, limiting new connections to decrease operational expenditures, and evaluating methods to reduce overhead. Summaries of measures to overcome revenue and expenditure impacts are provided in Table 6-8.

**Table 6-8  
Measures to Overcome Revenue and Expenditure Impacts During Shortage**

Reserves	Use of reserves may provide short-term rate stabilization, but require delays in capital expenditures and rebuilding of reserves after the water shortage.
Decrease Capital Expenditures	Delay major construction projects for facilities as well as upgrades and replacements.
Reduce Overhead	If staff reductions required, may impact operations and customer response.

## **6.6 MECHANISM TO DETERMINE REDUCTIONS IN WATER USE**

Under normal conditions, Western monitors sales and deliveries on a monthly and daily basis. All Western's water sales are metered and all connections are read monthly. Water orders are scheduled on a daily basis with water deliveries recorded daily. Water deliveries and transfers at booster stations can be monitored through Western's SCADA system to determine usage in various portions of the retail area. Western prepares monthly sales and delivery reports which are reviewed and compared to reports and statistics from prior months and the same period of the prior year. Under shortage conditions, these reports could be prepared as often as daily. In

additional billing reports could be reviewed to identify users who are not abiding by water the DAP or WCSSP plans.

**6.7 MINIMUM WATER SUPPLY AVAILABLE DURING NEXT THREE YEARS**

The UWMP Act requires a retailer to quantify the minimum water supply available during the years 2011 to 2013, assuming years 2011 to 2013 repeat the driest three-year historic sequence for each water supply source. As shown in Table 6-9, the total supplies, given a repeat of historically low conditions on all water supplies would be approximately 181,100 AFY. Comparing these supplies to the demand projections provided in section 2.4, Western has adequate supplies available to meet projected demands should a multiple-dry year period occur during the next three years.

**Table 6-9  
Minimum Water Supply Available During Next Three Water Years  
(AFY)**

	<b>2011</b>	<b>2012</b>	<b>2013</b>
Purchased Imported Water	166,513	166,513	166,513
Western Produced Groundwater	13,760	13,760	13,760
Transfers/Exchanges			
Recycled Water	950	950	950
<i>Total Supply</i>	181,223	181,223	181,223

## Chapter 7.0 REFERENCES

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### SECTION 6

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