2012 Agricultural Water Management Plan

Rancho California Water District

Adopted December 13, 2012

2012
AGRICULTURAL WATER MANAGEMENT PLAN

Rancho California Water District

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Adopted December 13, 2012

Message from the Board of Directors

Since the District's formation in 1977, the Rancho California Water District has remained steadfast in its commitment to provide a reliable supply of high-quality water, wastewater and reclamation services. Through leadership and representation, and working closely with our neighboring agencies, the District continues to plan for and meet the ever-changing needs of a growing and diverse community. Conserving and managing the area's unique water resources are essential to the continued viability of the community. By integrating local planning challenges and regional stakeholder partnerships, the District maximizes system reliability and efficiencies, while preservation of resources for future generations utilizing the principles of sustainability and prudent fiscal practices.

DIRECTORS

President	***John E. Hoagland***
Sr. Vice President	***Bennett R. Drake***
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Mission Statement

"The mission of the Rancho California Water District is to deliver reliable, high-quality water, wastewater and reclamation services to its customers and communities in a prudent and sustainable manner.

Rancho California Water District Executive Management

General Manager	***Matthew Stone***
Assistant General Manager	***Richard Williamson***
Director of Operations & Maintenance	***Craig Elitharp***
Chief Engineer	***Andrew Webster***
Chief Financial Officer/Treasurer	***Jeff Armstrong***
Human Resources Manager	***Eileen Dienzo***

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Agencies

CALFED	State/Federal collaboration to improve San Francisco Bay/Sacramento-San Joaquin River Delta
CDPH	California Department of Public Health
District	Rancho California Water District
DOE	U.S. Department of Energy
DOF	California Department of Finance
DWR	California Department of Water Resources
EMWD	Eastern Municipal Water District
EVMWD	Elsinore Valley Municipal Water District
LAFCO	Local Agency Formation Commission
MCWD	Murrieta County Water District *(consolidated with WMWD in November 2005)*
Metropolitan	Metropolitan Water District of Southern California
RCWD	Rancho California Water District
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SAWPA	Santa Ana Watershed Project Authority
SCAG	Southern California Association of Governments
SDCWA	San Diego County Water Authority
SFWPA	South Feather Water and Power Agency
SWRCB	State Water Resources Control Board
USBR	U.S. Bureau of Reclamation
USEPA	U.S. Environmental Protection Agency
WMWD	Western Municipal Water District

Facilities and Locations

CRA	Colorado River Aqueduct
SARI	Santa Ana River Interceptor
SRWRF	Santa Rosa Water Reclamation Facility
SWP	State Water Project
TVRWRF	Temecula Valley Regional Water Reclamation Facility
VDC	Valle del los Caballos

Measurements

AF	Acre feet
AFY or AF/Y	Acre-feet per year
cfs	Cubic feet per second
ged	Gallons per employee per day
gpcd	Gallons per capita (person) per day
gpd	Gallons per day
gpm	Gallon per minute
GWS	Gross water savings
HCF	Hundred cubic feet
MAF	Million acre feet
MCL	Maximum Contaminant Level
MG	Million gallons
mg/L	Milligram Per Liter (10^{-3} gram per liter)
MGD	Million gallons per day
pCi/L	Picocuries Per Liter (A unit of measure of levels of radon gas)
µg/L	Microgram Per Liter (10^{-6} gram per liter) or parts per billion

Glossary of Abbreviations and Terms

Water Quality

DBPs	Disinfection Byproducts
DWSAPP	Drinking Water Source Assessment and Protection Program
EDCs	Endocrine Disrupting Compounds
IX	Iron Exchange
MTBE	Methyl Tertiary-Butyl Ether
NDMA	N-nitrosodimethylamine
PCE	Perchloroethylene
PPCPs	Pharmaceuticals and Personal Care Products
TCE	Trichloroethylene
TDS	Total Dissolved Solids
Title 22	California Title 22 Drinking Water Standards
TOC	Total Organic Carbon
VOC	Volatile Organic Compounds

Other

Act	Agricultural Water Management Planning Act of 2009
AG	Agricultural
AWMP	Agricultural Water Management Plan
AG/D	Agricultural/domestic
AH/NR	Average Hydrology/Normal Replenishment
AOP	Advanced Oxidation Processes
AWT	Advanced Water Treatment
BMP	Best Management Practice
Board	Board of Directors
BOD	Biochemical Oxygen Demand
CEQA	California Environmental Quality Act
CI	Commercial and industrial
CII	Commercial, industrial and institutional
DMM	Demand Management Measure
DRIP	Desalination Research and Innovation Partnership
EOC	Emergency Operations Center
EIR	Environmental Impact Report
ESA	Endangered Species Act
ET or ETo	Evapotranspiration
IAWP	Interim Agricultural Water Program
IRP	Regional Integrated Resources Plan
IRPP	Infrastructure Reliability and Protection Program
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
Judgment	Modified Final Judgment and Decree
LPP	Local Projects Program
LRP	Local Resources Program
M&I	Municipal and Industrial
MF	Microfiltration
MOU	Memorandum of Understanding
NWDOP	New Water Demand Off-set Program
O&M	Operation and maintenance
PAC	Project Advisory Committee
PRISM	Precision Irrigation Scheduling Method
QSA	Quantification Settlement Agreement
RGPR	Recommended Groundwater Production Report
RO	Reverse Osmosis
RAWMP	Regional Urban Water Management Plan
SCCWRRS	Southern California Comprehensive Water Reclamation and Reuse Study
SDP	Seawater Desalination Program

Glossary of Abbreviations and Terms

STIP	Short-term Implementation Plans
TDR	Time Domain Reflectometry
UV	Ultraviolet Light
UWMP	Urban Water Management Plan
WBIC	Weather-based irrigation controllers
WARN	California Water Agencies Response Network
WSC Plan	Water Shortage Contingency Plan
WSDM	Water Shortage and Demand Management

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SECTION 1
INTRODUCTION

1.1 PURPOSE AND AGRICULTURAL WATER MANAGEMENT PLAN SUMMARY

An Agricultural Water Management Plan (AWMP or Plan) prepared by a water purveyor is to ensure the appropriate level of reliability in water service sufficient to meet the needs of its various categories of customers during normal, dry, or multiple dry years. The California Agricultural Water Management Planning Act of 2009 (Act) requires agricultural water suppliers to develop and adopt an AWMP no later than December 31, 2012. The AWMP is to be updated by December 31, 2015 and every five years thereafter in the years ending in zero and five. As such, the AWMP is regarded as a guideline subject to revision, with each update incorporating new strategies and requirements in response to new legislation and other changing conditions.

The legislature declared that the waters of the state are a limited and renewable resource subject to ever increasing demands; that the California Constitution requires that water in the State is to be used in a reasonable and beneficial manner; that urban water districts are required to adopt water management plans; that the conservation of agricultural water supplies is of great statewide concern; that there is a great amount of reuse of delivered water; that significant non-crop beneficial uses are associated with agricultural water use, including streamflows and wildlife habitat; that significant opportunities exist, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water; that changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served; that conservation of water shall be pursued actively to protect both the people of the state and the state's water resources; that conservation of agricultural water supplies shall be an important criterion in public decisions with regard to water; and that agricultural water suppliers shall be required to develop water management plans to achieve conservation of water.

The Rancho California Water District (RCWD or District) 2012 AWMP has been prepared in compliance with the requirements of the Act[1] (Appendix A), and describes the following:

- Water Service Area
- Water Service Facilities
- Water Demands
- Water Sources and Supplies
- Water Reliability Planning
- Water Shortage Contingency Plan
- Water Quality Information
- Efficient Water Management Practices

[1]California Water Code, Division 6, Part 2.8; §10800, et. seq. Established by Senate Bill X7-7 (2009).

1.2 AGRICULTUAL WATER MANAGEMENT PLAN PREPARATION AND ADOPTION

The District's 2012 AWMP incorporates requirements enacted by legislation, including Senate Bill (SB) x7-7 (2009), and considers other relevant legislation pertaining to water sources, water quality, and water use efficiency.

The sections in this AWMP correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10825 and 10826. The AWMP also includes information on efficient water management practices (EWMPs) pursuant to Section 10608.48 of the California Water Code. The sequence used to present the required information differs slightly in order to present information in a manner reflecting the unique characteristics of the District's water utility. Additionally, information may be repeated in different sections to appropriately address a required element of the AWMP. Further, the AWMP has been prepared consistent with information relating to water demand, supply, sources and reliability contained in the District's 2010 Urban Water Management Plan.

The Department of Water Resources (DWR) has provided detailed guidance to water suppliers in developing the 2012 AWMPs. Section 7 includes a completed DWR checklist for preparing the AWMP in compliance with the Water Code.

Plan Adoption

A copy of the adoption resolution and notice of public hearing for the District's 2012 AWMP is included in Appendix B. The 2012 AWMP was made available for public inspection prior to the public hearing in accordance with Water Code Sec. 10841, and the public hearing was properly noticed pursuant to Section 6066 of the Government Code.

Water Code section 10820(a) requires the District to prepare and adopt an AWMP on or before December 31, 2012 and file with the DWR within 30 days after adoption (Water Code Sec. 10843(b)(1)). Additionally, the AWMP will be provided to the cities of Temecula and Murrieta, the County of Riverside, the California State Library, all libraries within the RCWD service area, and to the Local Agency Formation Commission. The AWMP must also be made available to the public on the District Internet Web after adoption.

The AWMP was adopted as presented. Additional amendments or changes in the AWMP during any time prior to the next complete update and adoption, will also be formally reviewed and adopted by the District, and filed with DWR in accordance with Section 10840 of the Water Code.

Agency Coordination and Public Participation

Development of the 2012 AWMP was performed by the District's Planning Department in coordination with the District's Engineering Department and Operations Department.

The District is dependent on three sources for its long-term water supply; groundwater received through the Murrieta-Temecula Basin managed by the Santa Margarita River Watershed Steering Committee and a court-appointed Watermaster; imported State Water Project (SWP) water and Colorado River water from the Metropolitan Water District of Southern California (Metropolitan) through two wholesale water agencies – Eastern Municipal Water District (EMWD) and Western Municipal Water District (WMWD); and recycled water supplied by the District and EMWD. All of the District's water supply planning relates to the policies, rules, and regulations of these agencies.

The District coordinated with multiple agencies to obtain, discuss and utilize information in the development of the 2012 AWMP. Those agencies and additional agencies were provided the opportunity to comment on the draft 2012 AWMP. Table 1.2-1 shows the agencies and the level of participation.

Table 1.2-1
Agency Coordination in Preparation of the 2012 AWMP

Agency	Notified Preparing 2012 AWMP	Participated in Plan Development	Commented on Draft Plan	Attended Public Meetings	Contacted for Assistance	Sent a Copy of the Draft Plan
Eastern Municipal Water District	√				√	√
Western Municipal Water District	√	√			√	√
Metropolitan Water District of So. California						√
Santa Margarita River Watershed Watermaster						√
Santa Margarita River Watershed Steering Committee						√
County of Riverside	√				√	√
City of Murrieta	√				√	√
City of Temecula	√				√	√
Pechanga Band of Luiseno Indians						√
Fallbrook Public Utilities District						√
United States, Camp Pendleton						√

This AWMP details the specifics as they relate to the District and its service area and will refer to Metropolitan, EMWD, WMWD and the Watermaster throughout. Appendix C lists the numerous references used during the development of this Plan.

The AWMP is intended to serve as a general, flexible, and open-ended document that periodically can be updated to reflect changes in the regional water supply trends and constraints, and conservation and water use efficiency policies. This Plan, along with the District's Urban Water Management Plan, Water Facilities Master Plan, and Regional Integrated Resources Plan, as well as other District planning documents, will be used by District staff to guide the District's water use and management efforts through the year 2015, when the AWMP is required to be updated.

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SECTION 2
RANCHO CALIFORNIA WATER DISTRICT SERVICE AREA

2.1 RANCHO CALIFORNIA WATER DISTRICT SERVICE AREA

Organization, Size and History

The District is a "Special District" organized and operated pursuant to the California Water Code. The District is governed by a seven member board of directors (Board) that is elected by the voters of the region. The district serves the area known as Temecula/Rancho California, which includes the City of Temecula, portions of the City of Murrieta, and unincorporated areas of Riverside County.

The District started when landowners of the Temecula/Rancho California formed the original "Rancho District" in 1965, which served 41,000 acres of the easterly portion of the community. In 1968, the Santa Rosa Ranches Water District was organized to serve the westerly 44,800 acres of the community. To gain access to imported water to meet growing water demands and supplement local groundwater, the Rancho District was annexed in 1966 to the EMWD, while the Santa Rosa Ranches Water District was annexed into the WMWD in 1968. Both EMWD and WMWD are member agencies of Metropolitan. Metropolitan operates the Colorado River Aqueduct (CRA) and is a State Water Contractor, allowing imported water from Northern California to be delivered to Southern California via the State Water Project (SWP).

Figure 2-1
RCWD Service Area

In 1977, the Rancho District and the Santa Rosa Ranches Water District were consolidated under the name Rancho California Water District, in accordance with Local Agency Formation Commission (LAFCO) resolutions. The District has the authority to operate, maintain, and furnish facilities for all water systems within the District's service area, and for the collection and treatment of wastewater for the Santa Rosa Division (west of Interstate 15). EMWD remains responsible for the wastewater treatment in the Rancho Division (generally east of Interstate 15).

Location

The District is approximately 85 miles southeast of Los Angeles and 65 miles north of San Diego. Figure 2-1 on the previous page shows the District's service area. The District's current service area is bounded on the southeast by the Santa Ana Mountains and on the northeast by Gavilan Hills. The elevations of the valley floor range from 900 to 1,200 feet above sea level; however, the District pumps to a maximum elevation of 2,850 feet for some pressure zones in its service area.

Facilities

The District receives its water from groundwater, imported water, and recycled water. The District maintains wells to tap into the Murrieta-Temecula Groundwater Basin[2], is a member agency of EMWD and WMWD to receive imported water, and serves recycled water from treatment plants owned and operated by the District and EMWD. The District manages agreements and contracts with each of these agencies and continually monitors activities, projects and programs to insure the District's capability of meeting the water supply needs of its customers, both present and future.

The District operates its water distribution system in two divisions: the Santa Rosa Division in the westerly half, and the Rancho Division in the easterly half. Each division provides water through a number of pressure zones ranging from 1,305 feet above sea level to 2,850 feet.

The District's maintains 898 miles of water pipelines to convey water from its source to water customers, operates 44 active groundwater production wells, 37 storage reservoirs with a capacity of 138.1 million gallons (MG), and one open (surface) reservoir, Vail Lake, with a storage capacity of 49,370 acre-feet (AF) used to help recharge the groundwater basin, using natural runoff.

Treated imported water (potable) is received from Metropolitan's storage and filtration facility at Lake Skinner directly into the District distribution system through four turnouts. Raw water is delivered to the District from Metropolitan's Pipeline No. 5 through turnout WR-34 and Pipeline No. 6 through turnout EM-21. Raw water from EM-21 is conveyed through the Pauba Valley Transmission Main in De Portola Road to the District's Recharge and Recovery System. This system consists of 26 wells (included in the 44 active wells) and the Upper Valle De Los Caballos (VDC) and Lower VDC Percolation Basins, providing up to 30,000 AFY of groundwater production capacity, including both native production and import recharge recovery.

The District operates a non-potable (recycled) water system, which includes 64 miles of pipelines, four reservoirs, six pump stations, four seasonal storage ponds, and total system storage of 8 MG. Recycled water is delivered for irrigation through the District's

[2] California Department of Water Resources, California's Bulletin 118, Basin Number 9-05 is titled Temecula Valley Groundwater Basin, and is commonly known as the Murrieta-Temecula Groundwater Basin because the groundwater flows southeastward under Murrieta and Temecula Valleys, as well as southwestward beneath the Pauba Valley to the southwestern part of the basin.

recycled water supply system and multi-zone transmission piping network. The recycled water supply is from tertiary facilities at the Santa Rosa Water Reclamation Facility (SRWRF) and the seasonal storage ponds constructed adjacent to the reclamation facility. Recycled water is also received from the Temecula Valley Regional Water Reclamation Facility (TVRWRF) under agreement with EMWD.

The District also provides wastewater collection and treatment in the Santa Rosa Division. Wastewater facilities includes 83 miles of sewer lines, one treatment plant – the SRWRF, a 5 MGD sequencing batch reactor treatment facility with conventional advanced wastewater treatment, and three lift stations. Wastewater treatment and recycled water is discussed in more detail in Section 8.

The District maintains a telemetry system enabling 24-hour, remote monitoring of water system facilities from a central station located at the District's Operation's Yard. The central station is accessible remotely by system operators via personal computer. The SCADA System is comprised of three major component groups:

1. Sensing, control, and data transmission equipment located at remote sites.
2. Communications network consisting of data radios to allow bi-directional transmission.
3. Central monitoring and control station. Central station equipment includes computers and software, logging printers and other associated display and annunciation devices. It also includes a 24-hour alarm autodialer for after hour alarm monitoring.

In normal operation, the central station computer monitors and logs critical system operations and operating parameters such as pressure, flow, quantity of water pumped, and depth of water in reservoirs. The computer also responds, following prearranged instruction in the control software, to alarms or other abnormal situations and summons personnel to correct the malfunction.

Demographics

Current population projections were obtained for the District's service area from WMWD and EMWD, using both California Department of Finance (DOF) and U.S. Census Bureau data, and then adjusted to the service area boundaries using land-use and census tract level data. Table 2.1-1 presents these demographics in five year intervals beginning in 2010 and ending in 2035.

Within the District's service area, population is expected to continue to grow over the next 25 years at an average annual rate of approximately 1,158 persons for a total of approximately 28,950 new residents, representing a 1.5 percent annual growth rate for a total growth rate of approximately 21.7 percent over the projection period.

Table 2.1-1
Population Projections for RCWD Service Area

	2010	2015	2020	2025	2030	2035
Population	133,691	140,390	146,237	152,979	158,490	162,635

Source: EMWD, Draft 2010 AWMP, May 2011 and WMWD, Draft 2010 AWMP, May 2011

Growth in the RCWD service area routinely exceeded 10 percent per year from the mid-1980's to 1990's. IN the early 1990's, growth slowed during an economic recession. During the late 1990's, growth began to steadily increase, and the first five years of the 2000's brought accelerated population growth to the region. This growth has challenged RCWD to develop reliable sources of supply and construct new facilities and infrastructure. The late 2000's experienced a major decline in the housing development and growth slowed again during the recent economic recession. RCWD is still a growing water agency. RCWD is closely monitoring land development in its service area and will continue to reliably and responsibly meet the challenges of new development.

Land Use

The District service area is approximately 99,173 acres (155 square miles) in the southwestern portion of Riverside County. The District currently provides water for urban and agricultural uses in the City of Temecula, portions of the City of Murrieta, and unincorporated Riverside County lands. The District's build-out potable water service area is projected to be 90,622 acres and the recycled water service area is 1,524 acres. Accordingly, the remaining 7,027 acres of service area, or 7 percent of the total services area, is anticipated to be existing right-of-way or open space.[3]

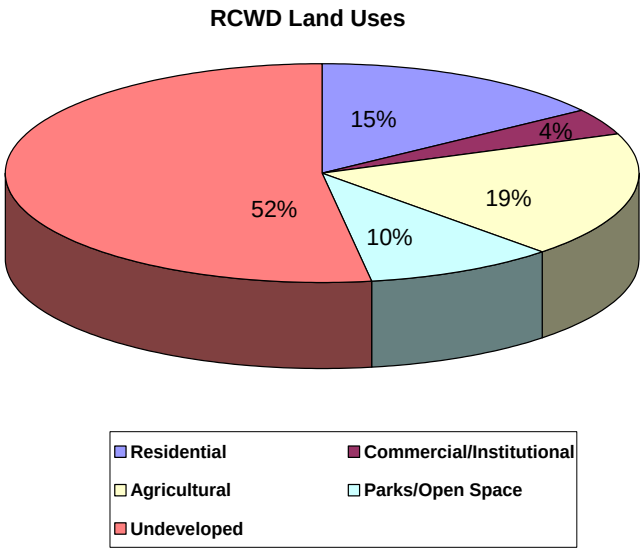

Figure 2-2
Land Use in RCWD's Service Area

The cities of Temecula and Murrieta have become desirable places to live due to their proximity to major cities in Southern California and a lower relative cost of living. Both cities have experienced rapid population growth and have a need for reliable water supplies. The District includes about 18,000 acres of agriculture and ranch lands, primarily vineyards, avocado, and citrus trees. Figure 2-2 shows the breakdown in land uses within the District. The Temecula Valley is becoming a premiere wine grape growing area in California, which

[3] Source: RCWD 2010 Water Demand Projections – Land Use Basis, October 12, 2010, pg. 4

coupled with other high-value crops, requires a consistent irrigation supply. Major agricultural acreage is concentrated in the southwestern and eastern portions of the district.

Terrain and Soils

The RCWD is within the Upper Santa Margarita Watershed, which includes portions of the Santa Margarita Hydrologic Unit contained within southwestern Riverside County. This area of the watershed includes approximately 548 square miles and includes a vast network of ephemeral streams with two main drainage basins, Temecula and Murrieta Creeks. Multiple individual hydrologic units are split between the upper and lower watershed.

Temecula Creek and its tributaries drain approximately 366 square miles with the upper portion of the watershed artificially controlled by a dam at Vail Lake. Lower portions of the drainage area, which is included in the District service area, are dominated by rolling hills and flat land.

Murrieta Creek and its tributaries drain approximately 222 square miles in the northwest portion of the upper watershed. At the Elsinore fault zone, located at the top of Temecula Canyon and near the City of Temecula, the drainage systems merge forming the Santa Margarita River. From this point the river flows through the Temecula Gorge and then into San Diego County near Fallbrook for approximately 30 miles ultimately draining into the Pacific Ocean.

The Soil Survey of Western Riverside Area (Survey), California[4] identifies the southern Riverside County area as nearly level to very steep and suitable for many kinds of crops. At the time of the survey (1971), a large area of rocky soils has a cover of brush and is pastured. Irrigation water brought to the area as early as the 1870s brought about the planning of citrus. The irrigated areas were also used for truck crops, alfalfa, grapes and permanent pasture. In the dry-farmed areas, barley and wheat were the major crops. Today, the area agriculture is predominantly citrus, avocados, and vineyards.

The Survey identifies the following three soil area descriptions within the District's service area (General Map):

Area 2 - Friant-Lodo-Escondido Association: Located in the western portion of the District, generally in the area of avocados and citrus, this area is defined as well-drained and somewhat excessively drained, undulating to steep, shallow to deep soils that have a surface layer of fine sandy loam and gravelly loom, on metamorphosed sandstone and mico-schist.

Area 5 - Hanford-Tujunga-Greenfield Association: Located in the eastern portion of the District, generally in the location of many of the vineyards, this area is defined as very

[4] U.S. Department of Agriculture, Soil Conservation Service, U.S. Department of Interior, Bureau of Indian Affairs, In Cooperation with the University of California Agricultural Experiment Station, *Soil Survey Western Riverside Area,* 1971 (http://soils.usda.gov/survey/online_surveys/california/w_riverside/ca_w_riverside.pdf)

deep, well-drained to excessively drained, nearly level to moderately steep soils that have a surface layer of sand to sandy loam, on alluvial fans and flood plains.

Area 6 - Moserate-Arlington-Exeter Association: Located in the central and more urban portion of the District, generally along the Murrieta Creek, this area is defined as well-drained, nearly level to moderately steep soils that have a surface layer of sandy loam to loam, and are shallow to deep to a hardpan.

As mentioned in the Facilities section above, the terrain within the District service area requires the District to operate a number of pressure zones ranging from 1,305 feet above sea level to 2,850 feet. Due to the varying terrain, water is delivered through nearly 900 miles of pipelines, from 44 active groundwater wells, 37 storage reservoirs and one open reservoir, and the use of multiple pump stations.

Climate Characteristics

The regional climate is Mediterranean with hot, dry summers and cool, wet winters. Summer daytime temperatures are in the mid-80 to high-90 degrees range. The area's temperature is influenced by prevailing onshore winds from the Pacific Ocean and the rain shadow effect from the Santa Rosa Mountains. The "Santa Ana winds" can cause periods of extremely hot weather with dry winds. Winter daytime temperatures are mild, averaging in the mid-60 degree range. The region's average monthly maximum temperature is 80.8 degrees, based on weather data from Sun City (nearest weather station to Temecula). The standard annual average evapotranspiration rate (ETo)[5] for the region is 49.54 inches per year (4.13 feet per year) with the highest rates occurring during the summer months.

Total annual precipitation at the Sun City weather station averages 11.4 inches per year. During very wet years, rainfall can exceed 25 inches, while during very dry years rainfall can be less than 4 inches. Rainfall is more prevalent during the months of November through April. Table 2.1-2 presents average climate data for the District's service area.

Table 2.1-2
Climate Data for RCWD Service Area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total or Average
Standard Average ETo (inches)[1]	1.83	2.20	3.42	4.84	5.61	6.26	6.47	6.22	4.84	3.66	2.36	1.83	49.54
Average Rainfall (inches)[2]	2.62	2.86	2.34	0.63	0.33	0.04	0.04	0.25	0.18	0.26	0.76	1.09	11.4
Average Max Temperature (F) [2]	66.2	68.4	69.7	76.7	82.7	91.6	97.8	98.1	92.6	84.2	74.2	67.5	80.8

[1]Source: http://www.cimis.water.ca.gov/cimis/frontMonthlyReport.doc. Station #137 - Temecula East II 2/1997 through 4/2011
[2] http://www.idcide.com/weather/ca/temecula.htm (Sun City Weather Station, 15.77 miles from Temecula)

[5] Evapotranspiration (ETo) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity. ETo from a standardized grass is commonly denoted at ETo.

2.2 RCWD OPERATING RULES AND REGULATIONS

The District has adopted its "Rules and Regulations Governing Water System Facilities and Services" as Part III, Chapter 1, Section 1 of the District's Administrative Code. A copy is included in Appendix D.

2.3 RCWD WATER DELIVERY MEASUREMENTS

The District has more than 43,000 water meter services that are maintained by District staff. All water services in the District are measured by water meters, with the exception of temporary construction services as defined in the Rules and Regulations.

In April 2012, the District's Board of Directors approved modification of Section 1.7.18 of the Rules and Regulations Governing Water System Facilities and Services (discussed in section 2.1 above), to provide specific guidelines for meter testing parameters and criteria for meter replacement based on usage rates or expected life-cycle.

The modified Rules and Regulations includes testing and repair requirements for: Initial Testing, Small Meter Testing and Repair, Large Meter Testing and Repair, Meter Testing at Customer's Request, and Meter Replacement Criteria. Table 2.3-1 lists the parameters for meter replacement and meter testing.

Table 2.3-1
Parameters for Meter Replacement and Testing

Meter Size	Replacement Schedule
¾"	Replace at 15 years
1"	Replace at 15 years
1.5"	100,000 hundred cubic feet (HCF) / 15 years
2"	100,000 HCF / 15 years
3" – 12"	Chamber exchange or rebuilt per usage
Meter Size	**Testing Schedule**
¾" – 2"	At the discretion of the District
3" – 4"	Annually – usage great than 10,000 HCF per year Biennially – usage greater than 5,000 HCF and less than 10,000 HCF per year Every five years – less than 5,000 HCF per year
6" – 12"	Annually, with usage

2.4 RCWD WATER RATES AND BILLING

Section 1.5.3.2 of the Rules and Regulations Governing Water System Facilities and Services of the Administrative Code confirms that to qualify for agricultural water service, the customer must use the water for "Agricultural Purposes, which is defined as the growing of raising of agricultural projects in conformity with recognized practices of husbandry, for the purpose of commerce, trade, or industry, or for feeding of fowl or livestock. Agricultural property must be one acre or more utilized exclusively for agriculture.

All water use in the District is billed monthly by quantity used. The District maintains a budget based tiered rate structure, which is designed to reduce water waste, promote efficient water use, and manage drought response in an equitable manner. The tiered rate structure gives each customer a customized water budget for efficient indoor and outdoor water use, which represents an appropriate amount of water to meet customer' needs. Only customers using water in excess of a reasonable efficient water use budget will pay the higher tiered rates.

In 2008, RCWD implemented a tiered-rate pricing structure for agricultural water use that promotes more efficient use of water at the farm level and reduces waste. Under this rate structure, each agricultural customer is charged a Tier 1 rate plus an energy/pumping charge for each hundred cubic feet of water (HCF) used up to an amount of water allocated to the customer for meeting the needs of their property. Water allocations provided to agricultural customers are based on:

- historical weather data (ETo) obtained from the California Irrigation Management Information System (CIMIS) network of weather stations
- crop water-use information obtained from agricultural and academic publications
- planted acreage obtained through GIS irrigated acreage measurements
- information about livestock reared for human consumption or market, and the associated irrigated grazing areas
- "incidental" domestic use are provided with additional water allocations for domestic indoor and landscape water use

Further details about the agricultural water allocations and pricing structure are included in Section 6, Efficient Water Management Practices, under EWMP 4: Implementing an Incentive Pricing Structure.

2.5 WATER SHORTAGE CONTINGENCY PLANNING AND ALLOCATION POLICIES

In order to ensure a reliable water supply in a water shortage situation, RCWD developed a water shortage contingency plan. A water shortage situation may be brought on by drought conditions caused by hot and dry weather, or a failure of the water delivery system due to seismic activity or other catastrophic event. A large portion of the water RCWD sells to its customers is imported from Metropolitan through EMWD and WMWD. Therefore, as part of RCWD's Water Shortage Contingency Plan it is important to present Metropolitan's plan in the case of a water shortage.

The following sections discuss RCWD's compliance with Water Code Section 10632, as well as Metropolitan's Water Surplus and Drought Management Plan and Water Supply Allocation Plan, and EMWD and WMWD's Water Shortage Contingency Planning.

2.5.1 Rancho California Water District

RCWD Water Shortage Contingency Plan (WSC Plan) (Appendix E) was adopted in July 2008, revised in June 2009, and recently revised and approved in May 2011. The Water Shortage Contingency Plan is developed in accordance with California Water Code 10632. The WSC Plan demonstrates the ability of RCWD to meet demands under a supply shortage of up to 50 percent. Emphasis is placed on protection of public health, sanitation, fire protection and general public welfare.

The WSC Plan adopts regulations and restrictions on outdoor water use only, including domestic, commercial/institutional, parks and golf courses, and agriculture. Recycled water users may be exempt from some restrictions in the WSC Plan.

The overall principle of the District's WSC Plan is to reliably meet water demands during shortages caused by droughts, supply reductions, and emergency conditions. The WSC Plan recognizes the following priorities for potable water:

1. Public safety, health and welfare
2. Economic sustainability
3. Quality of life for the District's customers

The potable water use regulated and/or prohibited under the WSC Plan is considered to be non-essential use. Continued use of such water during times of water shortage or other emergency supply conditions are deemed to constitute a waste of water and will be subject to appropriate penalties as described in Section 4 of the WSC Plan.

In the event that the reduction in water sales as a result of implementation of the WSC Plan negatively impacts the coverage of the District's fixed costs obligations, the District will utilize its drought reserves.

The District's WSC Plan identifies actions to be taken by water consumers within the District service area during periods of adequate water supply and during moderate, high, and severe water shortages. The purpose of the WSC Plan is to provide procedures with voluntary and mandatory provisions to minimize the effect of a water shortage and reduce overall water usage.

Prior to and during implementation of the WSC Plan, the District would likely meet water shortage demands by increasing groundwater pumping and implementing water use efficiency programs. Water for public health, safety and welfare, water for maintenance of water facilities, and "grey water" use are all exempt from mandatory reductions. Special case circumstances may be reviewed by the General Manager's Office.

The following presents the criteria for the five water stages under the WSC Plan, while the complete WSC Plan is included in Appendix E:

Stage 1 **Water Watch:** Able to meet the water demands of its customers in the immediate future.

While near term regional supply and storage conditions may from time to time improve due to wet weather, there are continued long term challenges that warrant continued wise and efficient use of water. These include ongoing regulatory restrictions on pumping from the Bay-Delta region for the State Water Project, which makes up a significant portion of RCWD's imported water supply. In addition, our Mediterranean climate and average rainfall of 14 inches in our service area make ongoing efficient water use imperative. RCWD and other retail water agencies in California have been mandated by the state to work with customers to achieve a 20 percent reduction in per capita water use by the year 2020. Under Stage 1 conditions, customers are requested to continue to use water efficiently, maximize recycled water use, practice sensible voluntary water conservation and take advantage of the District's indoor and outdoor water conservation incentive programs to eliminate water waste. It should also be noted that water waste is in violation of California Law and District's Water Waste Prohibition Ordinance at any Stage. Agricultural customers participating in the Metropolitan Interim Agricultural Water Program (IAWP) program shall comply with the ongoing terms of the program during its multi-year phase out. RCWD will set water budgets for IAWP participants at the level permitting by the Metropolitan program terms and declared Metropolitan supply conditions as they relate to the IAWP.

Stage 2 **Water Alert:** Probability that the District will not be able to meet all of the water demands of its customers.

There is a probability that the District may not be able to meet all of the water demands of its customers. This may correlate to Metropolitan's WSDM Plan stage of "Shortage" and the Metropolitan Allocation Plan's Regional Shortage Level 1 through 2, or may mean local groundwater levels are lower than normal. Expected water shortages for the District's municipal and industrial (M&I) customers are less than 10 percent. Additional voluntary conservation measures will be called upon during this stage. During this stage it is anticipated that the District's agricultural customers will be asked to comply with reduction plans, mandatory certification and allocations designed to meet Metropolitan's IAWP first level requirements. AG Request for Variance Forms will be considered but not guaranteed during Stage 2. Some nonessential outdoor water-use restrictions in the residential and commercial sectors may be implemented.

Stage 3 **Water Warning:** Not able to meet all of the water demands of its customers.

Water supplies are not sufficient to meet the District's M&I demands by more than 10 percent, but less than 20 percent. This may correlate to Metropolitan's WSDM Plan stage of "Severe Shortage" and the Metropolitan's Allocation Plan's Regional Shortage Level 3 through 4. During this stage it is anticipated that the District's agricultural customers will comply with additional IAWP demand restrictions including 10 and 20-percent reductions to site-specific allocations. AG Request for Variance Forms will not be considered during Stage 3 except for AG-Domestic customer health and safety reasons. Some restrictions on certain non-essential outdoor residential, commercial and landscape water use will be implemented. Financial penalties for non-compliance of such

restrictions will be imposed. Declaration of stage 3 will trigger the New Water Demand Off-set Program (NWDOP).

Stage 4 **Extreme Water Warning:** A major deficiency of any supply or failure of a distribution facility is declared.

Water supplies are not sufficient to meet the District's M&I demands by more than 20 percent, but less than 30 percent. This may correlate to Metropolitan's WSDM Plan stage of "Extreme Shortage" and the Metropolitan Allocation Plan's Regional Shortage Level 5 through 6. During this stage the District's agricultural customers will comply with additional IAWP demand restrictions that may include 45 and 60-percent reductions to site-specific allocations and urban landscapes will greatly reduce water use. AG Request for Variance Forms will not be considered during Stage 4 except for AG-Domestic customer health and safety reasons. If this stage is the result of an extended drought and has been triggered by Condition No. 1 of Section 2 of this WSC Plan, the District will explore increased conservation incentives for demand management measures that will have immediate and substantial impacts on water demands. More severe restrictions on non-essential outdoor water use will be implemented. Significant financial penalties for non-compliance of such restrictions will be imposed.

Stage 5 **Water Emergency:** A major deficiency of any supply by more than 30 percent or failure of a distribution facility is declared.

Water supplies are not sufficient to meet the District's M&I demands by more than 30 percent. This may correlate to Metropolitan's WSDM Plan stage of "Extreme Shortage" and the Metropolitan Allocation Plan's Regional Shortage Level 7 through 10 or may be as a result of an emergency situation resulting in the inability of the District's water distribution system to deliver all of the District's supply. During this stage the District's agricultural customers will greatly reduce water consumption for all crops, or might even be discontinued. AG Request for Variance Forms will not be considered during Stage 5 except for AG-Domestic customer health and safety reasons. Restrictions on all non-essential outdoor water use will also be implemented. Severe financial penalties for non-compliance of such restrictions will be imposed.

The impacts beginning in Stage IV would reduce total water use by an estimated 51 percent in the domestic and agricultural sectors alone. The Stage 4 restrictions would create savings in the sectors that make up the remaining 33 percent of total water use as well. Golf, construction, commercial, landscape, multiple dwelling, and schools and government would all realize reductions in water use under restrictions of Stage 4 water emergency. In the event of a 50 percent water shortage RCWD's Drought Ordinance Stage 4 will provide the appropriate measures to save water.

2.5.2 Metropolitan's Water Surplus and Drought Management Plan

In 1999, Metropolitan developed a WSDM Plan that included guidelines for implementing water supply restrictions in the event of a water shortage. The WSDM Plan does not outline specific criteria for how water would be distributed among the

Metropolitan member agencies during water shortage conditions, but states that the methods to be used for determining reduction in supplies to each member agency would be developed in a manner that was equitable and minimized hardship to retail water customers.

The WSDM Plan will guide management of regional water supplies to achieve the reliability goals of Southern California's IRP. The IRP sought to meet long-term supply and reliability goals for future water supply planning. The WSDM Plan's guiding principle is to minimize adverse impacts of water shortage and ensure regional reliability. From this guiding principle come the following supporting principles:

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

The WSDM Plan guides the operations of water resources (local resources, Colorado River, SWP, and regional storage) to ensure regional reliability. It identifies the expected sequence of resource management actions Metropolitan will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

The WSDM Plan describes Metropolitan's ability to meet demand during a Surplus, Shortage, Severe Shortage, and Extreme Shortage. Within the WSDM Plan, these terms have specific meaning relating to Metropolitan's capability to deliver water to the District, as follows:

Surplus: Metropolitan can meet full-service and interruptible program demands, and it can deliver water to local and regional storage.

Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation. In a Severe Shortage, Metropolitan may have to curtail Interim Agricultural Water Program (IAWP) deliveries in accordance with IAWP.

Extreme Shortage: Metropolitan must allocate available supply to full-service customers.

The WSDM Plan also defines five "surplus" management stages and seven "shortage" management stages to guide resource management activities. Each year, Metropolitan will consider the level of supplies available and the existing levels of water in storage to

determine the appropriate management stage for that year. Each stage is associated with specific resource management actions designed to: 1) avoid an Extreme Shortage to the maximum extent possible; and 2) minimize adverse impacts to retail customers should an Extreme Shortage occur. The current sequencing outline in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix. This sequencing may change as the resource mix evolves.

Reliability Modeling of the WSDM Plan

Using a technique known as "sequentially indexed Monte Carlo simulation," Metropolitan undertook an extensive analysis of system reservoirs, forecasted demands, and probable hydrologic conditions to estimate the likelihood of reaching each Shortage Stage through 2010. The results of this analysis demonstrated the benefits of coordinated management of regional supply and storage resources. Expected occurrence of a Severe Shortage is four percent or less in most years and never exceeds six percent; equating to an expected shortage occurring once every 17 to 25 years. An Extreme Shortage was avoided in every simulation run.

Metropolitan also tested the WSDM Plan by analyzing its ability to meet forecasted demands given a repeat of the two most severe California droughts in recent history. Hydrologic conditions for the years 1923–34 and 1980–91 were used in combination with demographic projections to generate two hypothetical supply and demand forecasts for the period 1999–2010. Metropolitan then simulated operation to determine the extent of regional shortage, if any. The results again indicate 100 percent reliability for full-service[6] demands through the forecast period.

Allocation of Supply for Municipal & Industrial Demands

The equitable allocation of supplies is addressed by the Implementation Goals for the WSDM Plan, with the first goal being to "avoid mandatory import water allocations to the extent practicable." The reliability modeling for the WSDM Plan discussed above results in 100 percent reliability for full-service demands through the year 2010. However, the second fundamental goal of the WSDM Plan is to "equitably allocate imported water on the basis of agencies' needs." Factors for consideration in establishing the equitable allocation include retail and economic impacts, recycled water production, conservation levels, growth, local supply production, and participation and investment in Metropolitan's system and programs. In the event of an extreme shortage, an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

In an effort to avoid allocation, import water reliability is planned through the Southern California IRP and the WSDM Plan. The IRP presents a comprehensive water resource strategy to provide the region with a reliable and affordable water supply for the next 25

[6] Firm demands can be viewed the same as full-service demands, and can be defined as, the following: *The total demand for water under the conditions existing in a particular period without mandatory rationing or other short-term water-use reductions, but reflecting the results of demand management measures.*

years. The WSDM Plan will guide management of regional water supplies to achieve the reliability goals of the IRP.

2.5.3 Metropolitan's Water Supply Allocation Plan

In 2007, Metropolitan began to update its plans for addressing water shortage conditions. The impetus for this was a combination of on-going dry conditions and reduced deliveries from the SWP, creating water supply challenges that threatened access to the imported supplies necessary to meet Southern California's water demands in the coming years. Critically dry conditions in the western United States, including the Colorado River experiencing the driest time in over a century, as well as the federal court ruling in late 2007 to protect the Delta Smelt in the Sacramento-San Joaquin River Delta which brought uncertainty about future pumping operations from the State Water Project, all contribute to the region's water supply challenges.

In preparing for the possibility of not meeting firm demands of its member agencies, Metropolitan's Board adopted the Water Supply Allocation Plan in February 2008, subsequently updated in June 2009. This plan is an extension of the WSDM Plan and includes specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. The Water Supply Allocation Plan is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's Regional AWMP.

Table 2.5-1 summarizes the surplus and shortage actions to be taken by Metropolitan as defined in the WSDM Plan. As shown, water shortage stage 7 is where the Water Supply Allocation Plan is implemented.

Table 2.5-1
Metropolitan Resource Conditions and Action Stages

Resource Stage	Action to be Taken
Surplus 5	Make cyclic deliveries
Surplus 4	Fill Central Valley Groundwater Basins
Surplus 3	Store Supplies in SWP Carryover
Surplus 2	Fill Conjunctive Use Basins
Surplus 1	Fill DWR and Diamond Valley Reservoir
Supplies = Demands	Conduct Public Affairs Program (Conservation)
Shortage 1	Utilize Diamond Valley Reservoir for Additional Supplies to MWD System
Shortage 2	Utilize Central Valley Groundwater Storage to Supplement Supplies
Shortage 3	Interrupt Long-term Seasonal and Replenishment Deliveries
Shortage 4	Take from Conjunctive Use and DWR Storage to Supplement Supplies
Shortage 5	Call for Extraordinary Conservation/Reduce Interim Agricultural Water Program (IAWP) Deliveries
Shortage 6	Call Options Contracts/Buy Spot Water
Shortage 7	Implement Water Supply Allocation Plan

Metropolitan's Water Supply Allocation Plan was developed in consideration of the principles and guidelines described in the WSDM Plan, with the objective of creating an equitable needs-based allocation. The plan's formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account: impact on retail customers and the economy; growth and population; changes in supply conditions; investments in local resources; demand hardening aspects of non-potable recycled water use; implementation of conservation savings program; participation in Metropolitan's interruptible programs; and investments in facilities.

The formula is calculated in three steps: based period calculations, allocation year calculations, and supply allocation calculations. The first two steps involve standard computations, while the third section contains specific methodology developed for the Water Supply Allocation Plan.

Step 1: Base Period Calculations

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the three most recent non-shortage years, 2004-2006.

Step 2: Allocation Year Calculations

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

Step 3: Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula are discussed in detail in Metropolitan's Water Supply Allocation Plan.

In order to implement the Water Supply Allocation Plan, the Metropolitan Board will make a determination on the level of the regional shortage, based on specific criteria, in April each year. If it is determined allocations are necessary, they will go into effect in July for that year and remain for a 12-month period, although the schedule is at the discretion of Metropolitan's Board.

In April 2009 and again in April 2010, Metropolitan concluded that water shortage stage 7 conditions existed and the Water Supply Allocation Plan was implemented, resulting in reduced deliveries to all Metropolitan member agencies.

In April 2011, Metropolitan recognized improvement in Southern California water reserves made possible by seasonal storms and the water-saving efforts of the region's consumers and businesses, and responded by ending its call for mandatory water restrictions.[7] On April 13, 2011, Metropolitan's Board of Directors voted to restore full imported water deliveries to its 26 member agencies for the first time since 2009. The winter storms allow Metropolitan to make significant strides in replenishing its network of groundwater storage programs and surface storage reservoirs. Lifting the water allocation restrictions allows local water agencies with groundwater basins to purchase water without financial penalty and store it. Groundwater reserves, which were significantly tapped over the past several years, have improved due to rain and local runoff.

As of April 2011, Metropolitan's Diamond Valley Lake was nearly full, after being less than half full in the summer of 2009, and Metropolitan also had more than a full year's worth of supply deliveries in reserve. However, despite Sierra Nevada snowpack conditions far above normal, Metropolitan will not receive a full supply from Northern

[7] Southland's Improved Water Reserve Conditions Allow Metropolitan's Board to Lift Mandatory Restrictions, Metropolitan Water District of Southern California, News Release, April 12, 2011

California in 2011 because of environmental problems and pumping restrictions in the Bay-Delta. Appropriately, Metropolitan emphasized the importance of continued water conservation and wise water practices as a permanent way of life in Southern California in order to maintain reserves, since the history has shown that the region's water challenges will continue.

2.5.4 EMWD Water Shortage Contingency Planning Affecting RCWD

EMWD's Water Shortage Contingency Plan applies regulations and restrictions on the delivery and consumption of potable outdoor water use during water shortages. EMWD's Water Shortage Contingency Plan was updated in April 2009 to account for changes in EMWD's water pricing structure and the Metropolitan Water Supply Allocation Plan.[8]

EMWD restrictions are structured to protect the safety, health and welfare of the public and minimize the impact a water shortage may have on the local economy and quality of life. Specific reduction requirements and restrictions are applied to four customer types, including residential and landscape, CII, agricultural, and wholesale water. Wholesale customers are allocated water using the formula and methodology based on MWD's Water Supply Allocation Plan.

Since EMWD will respond to Metropolitan's implementation of its WSDM Plan and activation of its Water Supply Allocation Plan, RCWD will be impacted by EMWD's water use restrictions in the event of a water shortage.

2.5.5 WMWD Water Shortage Contingency Planning Affecting RCWD

During a water shortage WMWD will adopt an Ordinance that restricts water usage and penalizes excess usage. Prohibitions of water use that may be imposed by WMWD include street/sidewalk cleaning, washing cars, lawn/landscape watering, non-permanent agriculture, uncorrected plumbing leaks, gutter flooding, and restrictions on construction use. According to the WMWD's Water Shortage Contingency Plan, the stages when these prohibitions become mandatory may vary. Unlike EMWD's plan which has specific measures to be taken during each of its four stages. The measures WMWD takes during a water shortage will apply to all retail and wholesale customers.

In addition, WMWD will respond to Metropolitan's implementation of its WSDM Plan and activation of its Water Supply Allocation Plan. WMWD has also prepared actions to be taken should a catastrophic event occur. Possible catastrophes it is prepared for include: regional power outage, earthquake, extreme weather, terrorism/sabotage, water borne diseases, and system failure. WMWD's Water Shortage Contingency Plan states that it may stop wholesale water sales during a water shortage emergency period, which will have a direct impact on RCWD supplies.

[8] EMWD, 2010 UWMP, Section 5, June 2011

2.5.6 Catastrophic Supply Interruption Plan

Water Shortage Emergency Response

A water shortage emergency could be the result of a catastrophic event such as the failure of water distribution facilities, a regional power outage, earthquake, flood, supply contamination from a chemical spill, or other adverse conditions. The RCWD Board of Directors shall be responsible for authorizing and directing implementation of the water conservation stages described in the Water Shortage Contingency Plan, as appropriate, to address emergencies.

In the event of a water shortage emergency, the District will employ its Emergency Response Plan to minimize the impact of supply interruption. The major objectives to be accomplished include the following:

- Provide essential water services
- Manage repair crews
- Meet city, county, and state established priorities
- Coordinate service from outside water agencies
- Provide and maintain an inventory of potable water resources
- Develop priorities

These objectives will be met through careful implementation of response activities, which include the following:

- Preserve water in storage
- Isolate areas for which restoration of service will require the longest period of time to accomplish and arrange for emergency water distribution
- Identify areas that can be served with minimal repairs
- Set priorities for repair work

RCWD's Emergency Response Plan provides a framework for an organized response to an earthquake or other major or catastrophic emergency. The primary objectives of the plan are to maintain the functionality of the water distribution system, assess the system and, if necessary, make rapid repair to any damage, and prevent any further damage. The District's response to an earthquake or other major emergency will be directed by the General Manager.

RCWD Response Phases in the event of an Earthquake include the following:

Phase I Inspection: A rapid inspection to determine injuries and any damage which might affect the distribution system.

Phase II Report Back: Emergency communications flow; additional inspection procedures.

Phase III Repair: Coordination of maintenance forces.

Phase IV Management Procedures: Key Management responsibilities for the emergency.

Phase V Operating/Maintenance/Engineering: Outlines procedures for division personnel.

Prior to Phase I inspections, System Operators and Inspectors report to the Emergency Operating Center (EOC) to receive assigned inspection routes. The EOC creates a communications hub for the District to efficiently manage their available resources. For example, personnel inspecting Vail Dam, wastewater treatment facilities, and wells receive their assignments from and report their findings to the EOC. The Emergency Response Plan contains ten areas that are inspected with driving directions for specific inspections routes. If inspections reveal damage to any of the areas the necessary repairs are made. Communications are ongoing at all phases of the response to an earthquake. The District has a primary and secondary radio systems to insure communications will be available during an emergency.

The Emergency Response Plan also includes an analysis of the potential of an electrical power outage. RCWD depends on electricity to boost water to higher elevations via pumping stations, although some wells use natural gas as their energy source. The Plan discusses RCWD's sources of electricity and analyzes a history of power outages. The history of power outages includes the name of the circuit, reason for the power outage, the date and time of outage, and the length of the power outage. In an emergency situation involving a power outage, RCWD will utilize emergency generators to provide customers with a reliable source of water.

Catastrophic Loss Planning Measures

To safeguard the region from a catastrophic loss of imported water supply, Metropolitan and its member agencies have made and are continuing to make substantial investments in emergency storage and interconnections with adjacent water purveyors. Metropolitan's emergency plan assumes that demands are reduced 25 percent from the 2020 baseline demand forecast through extraordinary conservation, while the local supplies are largely undisrupted. With few exceptions, Metropolitan asserts it can deliver emergency supply from its Diamond Valley Lake Reservoir throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted by a major earthquake. Metropolitan's WSDM Plan will guide management of available supplies and resources during an emergency.

While EMWD and WMWD have prepared for emergencies through storage, facility design and redundant power sources, RCWD receives imported water directly through Metropolitan pipelines, thereby not affected by interruptions in EMWD or WMWD facility interruptions or losses, assuming Metropolitan pipelines are not affected.

RCWD has also prepared for emergencies through storage, facility design and redundant power sources. Emergency storage requirements are based on the potential for a major earthquake or facility failures that render major water transportation facilities out of

service for six months. RCWD has 37 storage reservoirs with 54.7 MGs of storage in the Santa Rosa Division and 83.4 MG of storage in the Rancho Division for a total of 138.1 MG, enough local storage for two average days.

In the event that one or more water supply sources are unavailable, remaining source of supply will be maximized to meet demand, while implementing the District's Water Shortage Contingency Plan and activating the District's Emergency Response Plan.

Health and Safety Requirements

The primary goal of the District's water system is to preserve the health and safety of its personnel and the public. Meeting this goal is a continuous function of the water system – before, during and after a disaster or water shortage. Fire suppression capabilities will continue to be available during any water shortage contingency stage. Some water needs are more immediate than others. The following is a guideline of public health needs and the approximate allowable time without potable water that can be endured:

- Hospitals – continuous need
- Emergency shelters – immediate need
- Kidney dialysis – 24 hours
- Drinking water – 72 hours
- Personal hygiene, waste disposal – 72 hours

Priority by Use

Preservation of health and safety is paramount in the use of District water resources. Water resources of the District shall be put to maximum beneficial use to the extent to which they are capable. Water waste shall be prevented. Efficient and effective water conservation methods shall be implemented and encouraged to the maximum extent possible to afford the maximum beneficial use of the water resources by District customers and to promote public welfare.

2.5.7 Prohibitions, Penalties, and Consumption Reduction Methods

As presented in Section 4.3.1, during Stage I – Normal Condition RCWD requests its customers use water wisely and practice water conservation measures as to not waste water. Customers are to avoid use of water that creates runoff and drainage. RCWD states that water waste is a violation of California Law and District Regulations even if there is not a water shortage.

The District's Water Conservation Policy (Appendix F) includes the authority to issue Water Waste Notifications to customers who are reported to the District for the inefficient use or waste of water. The Water Waste Complaint Form is conveniently available online on the District's website at https://www.ranchowater.com/abuse.aspx. District Operations staff who are out in the field can also report water waste by filling out a field report and submitting it to the RCWD Planning Department staff for tracking and customer notification. The Notifications frequently initiate correspondence between

customers and District staff for resolving water use issues. As of May 2011, District staff has issued 502 Water Waste Notifications.

The Water Conservation Policy, Section 3, establishes Penalties and Restitutions for customers with excessive runoff that would cause water to flow from the property into any gutters, streets, or alleys. The Policy sets forth violation levels for residential and commercial customers. Violations include written notice for the first violation, a required "Evaluation Check List" to be completed and returned in the second notice, a $30 surcharge for the third violation, a $60 surcharge and a "Water Use Efficiency Evaluation Report" for the fourth violation, a $300 surcharge for the fifth violation, and finally, a flow restrictor installed at the customer's meter until the problem is resolved.

In July 2010, RCWD established a budget based tiered rate schedule. A customer's efficient water use budget is the combination of their Tier 1 and Tier 2 budget. These are also the lower cost tiers in terms of the unit rate charged for usage. Tiers 3 and 4 represent usage above the efficient level and also reflect the higher cost of providing water for this usage. The rate structure includes the use of higher tiered rate revenue for current water use efficiency programs. In this way, the customers that are using water in excess of their allocation for efficient use help to fund water use efficiency programs that they are offered to help improve efficiency of water use. For customers that respond to the tiered rate signal and implement new efficiency measures, a lower water bill will result. Customers who were already using water efficiently are less burdened with the cost of the District's efficiency and new supply programs and enjoy lower water bills than if all of these costs were blended to all customers.

From time to time when appropriate based on water resource conditions, Metropolitan establishes limited water allocations and penalty rates. In these instances, and when it is required, RCWD will pass through penalties from Metropolitan to its customers.

2.5.8 Revenue and Expenditure Impacts and Measures to Overcome Those Impacts

RCWD's rate structure is designed to mitigate the impacts of reduced sales volumes through adequate fixed revenue coverage. As stated in RCWD's 2009 Comprehensive Financial Report, "It is the intent of the Board of Directors that the costs of providing water and sewer services are financed primarily through user charges, and that fixed costs are recovered through fixed revenues and variable costs are recovered through variable revenues. This method better positions the District to maintain a stable and equitable rate structure during normal and abnormal weather conditions, as well as periods of drought that result in material reductions of water sales".

In addition, the District has a Cash Reserve Policy to deal with risk. One element of that reserve policy is a Drought Reserve. The Drought Reserve takes into account changes in the District's water supply operational costs and the reduced revenues from lower water sales. The target Drought Reserve level is $5.1 million. This reserve will be used to minimize rate impacts caused by the implementation of the District's WSC Plan.

Any penalties collected through non-compliance of the WSC Plan would be partially used to replenish this Drought Reserve, implement additional demand management measures during an extended water shortage, contribute to increased administration costs, and pay for any Metropolitan penalties imposed to the District.

2.5.9 Mechanisms to Determine Actual Reductions in Water Use

The District's telemetry system assists in monitoring and controlling the District's water production and distribution. Since water production correlates directly with demand, regular production monitoring allows the District to become immediately aware of any changes in water consumption. Water system personnel track production continuously. In the event of a declared water shortage, the District would monitor water production as needed, to determine actual water demand shortages. Production data may be used to measure the effectiveness of any water shortage contingency stage that would be implemented.

In addition, the District will be able to track actual reductions in water use through its billing system. The billing system tracks actual use on a monthly basis no matter the supply situation. RCWD has over ten years of consumption history for each customer. RCWD's aggressive water meter replacement ensures the use being tracked via the billing system is reliable and accurate.

SECTION 3
INVENTORY OF WATER SUPPLIES

3.1 WATER SOURCES

The District currently obtains water from the following primary water sources: 1) local groundwater from the Murrieta-Temecula Groundwater Basin; 2) imported SWP and Colorado River water from Metropolitan through EMWD and WMWD; and 4) recycled water from both District and EMWD facilities.

The District receives its imported water (treated and untreated) directly through six Metropolitan water turnouts, three in EMWD's service area and three in WMWD's service area. The District pumps groundwater from 52 district wells[9] and recycles water at its SRWRF. Additional recycled water is available from EMWD's TVRWRF.

The District owns and operates 37 storage reservoirs and one surface reservoir, Vail Lake. The storage capacity of Vail Lake is 49,370 acre AF and it is used to help recharge groundwater, currently using natural runoff.

Each of these sources of water are briefly described in the following sections, while the quantities and agreements with the agencies are described more fully in Section 3.2, Water Supplies.

3.1.1 Metropolitan Water District of Southern California (Metropolitan) – Imported Water

Metropolitan is a public agency formed in 1928 to bring imported water to the Southern California region. Collectively, the 13 charter members recognized the limited water supplies available within the region, and realized that continued prosperity and economic development of southern California depended on the acquisition and careful management of an adequate supplemental water supply. This foresight made the continued development of southern California possible.

The first function of Metropolitan was building the Colorado River Aqueduct (CRA) to convey water from the Colorado River. In 1960, Metropolitan contracted for additional water supplies from the SWP via the California Aqueduct, which is owned by the state of California and operated by DWR. Metropolitan current receives from both of these sources to supply water to most of southern California. As a wholesaler, Metropolitan has no retail customers, and distributes treated and/or untreated water directly to its 26 member agencies, including the EMWD and WMWD.

Metropolitan member agencies receive imported water at various delivery points on its system. Agencies pay for service through a rate structure made up of multiple components consisting widely of uniform volumetric rates, and the majority of revenue is

[9] RCWD Recommended Ground Water Production FY 2011-2012, Geoscience Support Services, Inc., January 14, 2011

collected through a tiered volumetric supply charge. The cost of maintaining existing supplies and developing additional supplies are recovered through a two-tiered pricing approach. The Tier 1 Supply Rate recovers the majority of the supply costs and reflects the cost of existing supplies. The Tier 2 Supply Rate reflects Metropolitan's cost of developing new long-term firm supplies so that member agencies with increasing demands on the Metropolitan system pay a greater proportion of the cost to develop these additional supplies.[10]

Metropolitan owns and operates the CRA along with major reservoirs such as Diamond Valley Lake and Lake Skinner, five regional water treatment plants, and large transmission pipelines to move imported water to its 26 public member agencies, including EMWD and WMWD. Metropolitan is also the largest State Water Contractor, with a contract of 2.0 million acre-feet (MAF) for SWP supply, although recent cutbacks, discussed below, limit access to this water. CRA supply, historically providing over 1.2 MAF per year to the region, has been severely cut in recent years due to the implementation of "*California's Colorado River Water Use Plan"* or the *"California Plan"*, which characterizes how California would develop a combination of programs to live within its 4.4 MAF per year entitlement of Colorado River water.

Metropolitan augments its imported water from the CRA and SWP with stored water in water banks such as Semitropic and Arvin-Edison, conjunctive use storage in local groundwater basins, and voluntary water transfers during certain dry years. In addition, MWD's Diamond Valley Lake can store 800,000 AF of imported water, which is used to meet demands during dry years and emergencies.

Colorado River Water

Metropolitan has a legal entitlement to receive water from the Colorado River. The CRA transports water from Lake Havasu, at the border of the state of California and Arizona, approximately 242 miles to its terminus at Lake Matthews in Riverside County, with a capacity of 1.25 MAF a year.

Over the years, Metropolitan has implemented a number of Colorado River water management programs to enhance use of Colorado River water to reach the target level of deliveries from the CRA. Projects include conservation programs, crop rotation and fallowing programs, and water storage programs.

State Water Project

The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants operated by DWR. The official starting point of the SWP is Lake Oroville, which is 70 miles north of Sacramento in Butte County. The SWP transports Feather River water that is stored in Lake Oroville and also released from Oroville Dam. Metropolitan imports water from the SWP. Unregulated flows are diverted directly from the Bay-Delta south via the California Aqueduct to four delivery points near the northern and eastern

[10] MWD 2010 Regional Urban Water Management Plan, pgs.1-7 and 2-30

boundaries of Metropolitan's service area. Metropolitan is one of 29 urban and agricultural agencies that have long-term contracts for water service from DWR. A current lack of storage poses additional risks to the reliability of SWP water supplies.

Recently, Metropolitan has increased its ability to supply water, particularly in dry years, through implementation of storage and transfer programs. Municipal and institutional use accounts for 93 percent of water use, while agricultural use is 7 percent and declining due to urbanization and market factors, including the price of water.[11] The SWP provides imported water to the Metropolitan service area and has provided up to 70 percent of Metropolitan supplies. The California Aqueduct is capable of transporting Metropolitan's full contract amount of 1.9 maf per year. However, the quantity of water available can vary significantly year to year.

To aid in planning future water needs, member agencies inform Metropolitan in April of each year how much water they anticipate they will need during the next five years. Metropolitan also works with its member agencies to forecast future water demands.

Metropolitan continues to face ongoing water supply challenges. The drought experienced during the last three years has resulted in diminished snowmelt and runoff levels and additional environmental restrictions were imposed on water exports from the San Francisco/Sacramento-San Joaquin Delta (Bay-Delta). The export of water from the Bay-Delta has experienced water quality and supply reliability challenges and conflicts due to variable hydrology and environmental standards that limit pumping operations. By the end of 2009, mandatory conservation was in place across much of Metropolitan's service area. However, in April 2011, the State pronounced the end of the drought period citing above-average rainfall, excellent snowpack, and reservoir levels significantly increased. Nevertheless, Metropolitan will continue its current strategy of implementing an adaptive resource development plan for the greatest benefit to the region into the future.[12]

Despite increasing challenges to imported water supplies from the Colorado River and SWP, Metropolitan expects to maintain a reliable supply for its member agencies provided that new programs are implemented.

Due to competing needs and uses for all of the water sources, and regional water operation issues, Metropolitan undertook a number of planning processes: the Integrated Resources Planning Process, the Water Surplus and Drought Management (WSDM) Plan, the Strategic Planning Process, and the Regional Urban Water Management Plan to provide a framework and guideline for optimum water planning into the future.

Reliability of Metropolitan's supply is further discussed in Section 4.0, Water Reliability Planning.

[11] MWD 2010 Regional Urban Water Management Plan, *Water Demands,* p. 1-13, November 2010
[12] MWD 2010 Regional Urban Water Management Plan, *Implementing the Plan,* p. 3-1, November 2010

3.1.2 Western Municipal Water District – Imported Water[13]

WMWD is a public water agency formed in 1954 to bring supplemental water to growing Riverside County. WMWD is a member agency of Metropolitan and provides wholesale water to nine retail agencies with water from Metropolitan, which consists of water from the Colorado River and the SWP, as well as water from groundwater desalters. The retail agencies include RCWD, as well as the cities of Corona, Norco, and Riverside, Eagle Valley Mutual Water Company, Elsinore Valley Municipal Water District, Lee Lake Water District, and Jurupa Community Services District. In addition, WMWD serves water directly to approximately 23,000 domestic and 130 irrigation connections in its retail service area to a population of about 85,000 in the unincorporated areas of Riverside County.

WMWD's service area, wholesale and retail, consists of a 510-square mile area of western Riverside County and an estimated population of more than 541,000 people. Approximately 437 square miles are within the wholesale area. In 2010, WMWD delivered approximately 25,000 AF of water in its retail area and sold more than 58,000 AF to its wholesale agencies. In addition, WMWD operates and maintains domestic and industrial wastewater collection and conveyance systems for retail and contract service customers.

About 60 percent of the water WMWD sells is treated; the balance is untreated or raw water. About one-third of WMWD's water sales are for domestic purposes; the rest is wholesale. About one-quarter of the water WMWD purchased from Metropolitan is from the CRA and about three-quarters from the SWP. WMWD also imports a small quantity of groundwater from the Riverside/San Bernardino area and also has some groundwater resources in local groundwater basins.

3.1.3 Eastern Municipal Water District – Imported Water[14]

EMWD is a public water agency formed in 1950 to deliver imported water to supplement local groundwater for a small, mostly agricultural, community. Over time, EMWD evolved to include groundwater production, desalination, water filtration, wastewater collection and treatment, and regional water recycling to the list of products and services it offers to its approximate 100,000 customers.

EMWD is a member agency of Metropolitan and receives imported water from the CRA and the SWP. EMWD provides wholesale water to the District as a sub-agency. Six other agencies also receive Metropolitan water through EMWD, including the cities of Hemet, Perris, San Jacinto, and Lake Hemet Municipal Water District, McCanna Ranch Water Company, and Nuevo Water Company.

EMWD is located in western Riverside County, approximately 75 miles east of Los Angeles. EMWD's 555-square mile service area includes six incorporated cities in

[13] WMWD, 2010 UWMP, June 2011
[14] EMWD, 2010 UWMP, June 2011

addition to the unincorporated areas of the County of Riverside. EMWD also serves retail water customers in several cities and multiple unincorporated communities of Riverside County. In most of these areas, EMWD operates and maintains both water and sewer service; however, in some areas, EMWD provides only water or sewer service.

EMWD's sources of supply are imported water from Metropolitan, local groundwater production, and recycled water. Sources of potable water supply, suitable for all uses including human consumption, include imported water from the CRA and SWP, groundwater in the San Jacinto Watershed, and desalinated groundwater treated through reverse osmosis to reduce the high salt content. EMWD sources of non-potable supply include raw water from Metropolitan for groundwater recharge and agricultural purposes, and recycled water from EMWD Temecula Valley Regional Water Reclamation Facility (TVRWRF) for agriculture, landscape irrigation, and industrial use.

3.1.4 Murrieta-Temecula Groundwater Basin – Groundwater

The District receives groundwater from the Murrieta-Temecula Basin (Basin), also known as the Temecula Valley Basin. The Basin underlies several valleys in southwestern Riverside County and a portion of northern San Diego County, within the Santa Margarita River Watershed. Two aquifers within the Basin – the Pauba aquifer and the Temecula aquifer – include eight underlying groundwater basins, which are based upon surface water hydrology subbasins. Agencies that pump from the eight basins include RCWD, WMWD, the Pechanga Indian Reservation, and several private pumpers.

The Pauba aquifer covers approximately 18 square miles. Well yields in the aquifer are excellent and typically range from 500 gallons per minute (gpm) to 2,000 gpm. The storage capacity of the Pauba aquifer has been estimated at 200,000 AF. The Pauba aquifer is underlain by the confined Temecula aquifer.

The Temecula aquifer extends over an area of approximately 100 square miles and is comprised of consolidated sediments that underlie and extend beyond the boundaries of the Pauba aquifer. Well yields in the aquifer range from several hundred gpm to approximately 2,000 gpm. The District believes storage capacity of the Temecula aquifer is estimated at 2 MAF, while DWR reports groundwater storage within both the Pauba and Temecula aquifers at approximately 250,000 AF.

Basin Governance and Management

The Basin has been governed under court jurisdiction since 1928, as part of the Santa Margarita River Watershed system. In 1940, a Stipulated Judgment ("1940 Judgment") was issued directing the use and allocation of groundwater in the region. Although considered an adjudicated basin, specific water rights have not been assigned. In 1963, a Final Judgment and Decree was issued further defining the use of groundwater in the region, and in April 1966, a Modified Final Judgment and Decree ("Fallbrook Case") was entered incorporating interlocutory judgments and the 1940 Stipulated Judgment. This document produced an Application to Appropriate Unappropriated Water to DWR in the

Temecula Creek, but was not fully executed until 2009 when the State Water Resources Control Board (SWRCB) issued Permit 7032 to RCWD providing water appropriations in Vail Lake.

These judgments were followed by years of court cases and power struggles by multiple parties, including the Federal government (U.S. Marine Corps Camp Pendleton) over water use in the watershed basins, citing the judgments did not fully meet the needs of the parties for effective water management. Finally, after many years, a settlement agreement, *"Cooperative Water Resource Management Agreement between Camp Pendleton and Rancho California Water District",* was reached and executed in March 2002. This agreement supersedes the previous judgments (1940 Judgment and Fallbrook Case) and remains in place today to govern water flow in the Santa Margarita River and use of the Murrieta-Temecula Basin.

Further, in December 2006, a 'Groundwater Management Agreement between Rancho California Water District and the Pechanga Band of Luiseno Mission Indians' was executed to govern the management of groundwater pumping from the Wolf Valley Groundwater Basin in a manner not to exceed the safe yield that protects groundwater resources in the Wolf Valley Groundwater Basin for present and future uses.

To further manage water in the region, a Watermaster was assigned by the court to oversee all uses within the Santa Margarita River Watershed, which includes three groundwater basins: the Santa Margarita Groundwater Basin, the Anza Groundwater Basin, and the Murrieta-Temecula Groundwater Basin. The Watermaster prepares the "Santa Margarita Watershed Annual Watermaster Report, providing annual reporting of water conditions in the watershed, but does not manage the groundwater basins. The Annual Watermaster Report, prepared pursuant to the U.S. District Court Order, March 13, 1989, includes information on surface and subsurface water, imports and exports, water rights, water production and use, threats to water supply, water quality, review of agreements, and Watermaster five-year projection of activities. The Court has retained jurisdiction over all surface flows of the Santa Margarita River Watershed and all underground waters determined by the Court to be subsurface flow of streams or creeks or which is determined by the Court to add to, support or contribute to the Santa Margarita River stream system. Local vagrant groundwaters that do not support the Santa Margarita River stream system are outside the Court jurisdiction.

The three groundwater basins noted above underlie the Metropolitan member agency service areas of EMWD and WMWD, and the Pechanga Indian Reservation overlies some of the southwestern part of the Murrieta-Temecula Basin. The Murrieta-Temecula Basin is also included in MWD's Groundwater Assessment Study (September 2007), which the District also utilizes to help manage the Basin.

The following documents as referred to in this section, support the management of the Murrieta-Temecula Basin:

1. Santa Margarita River Watershed Annual Watermaster Report, Water Year 2008-09, Charles W. Binder, Watermaster, September 2010
2. Recommended Ground Water Production, Fiscal Year July 1, 2011 through June 30, 2012, Rancho California Water District, January 14, 2011
3. Permit for Diversion and Use of Water, Amended Permit 7032, Temecula Creek/Santa Margarita River for use in Vail Lake and District M&I by Rancho California Water District, April 22, 2009 and 1946 Application to Appropriate Unappropriated Water.
4. Groundwater Management Agreement, Rancho California and Pechanga Band of Luiseno Mission Indians, December 21, 2006
5. Cooperative Water Resource Management Agreement between Camp Pendleton and Rancho California Water District, March 2002

3.1.5 Recycled Water

Recycled water in the RCWD service area is produced from two facilities: the SRWRF operated by RCWD, and the TVRWRF operated by EMWD. Both plants treat wastewater to Title 22 standards. In 2010, RCWD served approximately 4,400 AFY of recycled water.

At present, RCWD is maximizing recycled water from these two plants to meet landscape irrigation demands. Additional recycled water from TVRWRF could be used if advanced treatment beyond Title 22 standards was applied. As a result, not all of the recycled water from TVRWRF is beneficially used and must be pumped out of the basin for reuse in other basins or discharged to Temescal Creek.

3.2 WATER SUPPLY

Historically, groundwater has supplied between 25 to 40 percent of the District's total water supply and imported water has supplied between 60 to 70 percent. Recycled water has provided less than 5 percent; however, current and planned improvements will increase the use of recycled water. Table 3.2-1 summarizes the District's current and projected water supplies under normal conditions. The Water Reliability Analysis of these supplies is presented in Section 4, Water Reliability Planning.

Table 3.2-1
RCWD Current and Projected Water Supplies
(AF)

Water Supply Sources	2010	2012 Est.	2015	2020	2025	2030	2035
Imported Water (MWD)							
Treated	29,864	36,702	46,960	51,134	55,623	59,901	64,390
Untreated [1]	12,187	12,512	13,000	23,000	23,000	23,000	23,000
Untreated [2]	3,939	3,963	4,000	4,000	4,000	4,000	4,000
Local Groundwater Pumping	24,556	25,334	26,500	26,500	26,500	26,500	26,500
Recycled Water [3]	8,764	8,876	9,044	9,604	9,604	9,604	9,604
Vail Lake Release[4]	2,724	2,834	3,000	3,000	3,000	3,000	3,000
Total Supplies	**82,034**	**90,222**	**102,504**	**117,238**	**121,727**	**126,005**	**130,494**

Source: 2010 RCWD Urban Water Management Plan

Note: Imported and Recycled water amounts shown include unaccounted-for water.

[1] Used for groundwater recharge.
[2] Used for flows to the Santa Margarita River under settlement agreement with Camp Pendleton.
[3] Includes total capacity for the SRWRF (3,160 AFY in 2010, 3,440 AFY in 2015 and 4,000 AFY in 2020 and beyond) and total under agreement with EMWD from the TVRWRF (5,604 AFY or 5 MGD). As discussed in Section 3.24, RCWD is maximizing recycled water use based on current system capacity and access to the supply. RCWD is continuing work to increase capacity and supply access.
[4] Vail Lake releases to the Valle de los Caballos spreading basins for groundwater recharge.

3.2.1 Imported Water

The District is a member agency of both EMWD and WMWD, which are member agencies to Metropolitan. Imported water, treated and untreated, is received through six Metropolitan turnouts (three in each of EMWD's and WMWD's service areas). However, EMWD and WMWD do not convey the water through their facilities to the District. Rather, the District receives the water directly at these Metropolitan turnouts.

As shown in Table 3.2-1, the District obtained approximately 30,000 AFY of treated water and 16,000 AFY of untreated water from Metropolitan[15] for use in its service area in 2010. Table 3.1-2 shows historical Metropolitan water purchases during the past ten years from 2001 to 2010. During this period imported water purchases, including imported water used for groundwater recharge and flows to the Santa Margarita River under agreement with Camp Pendleton, have varied due to climatic and economic factors.

[15] When stated throughout this AWMP that imported water is from Metropolitan, it is understood that the water is obtained from Metropolitan through either EMWD or WMWD.

Table 3.2-2
Historical Metropolitan Water Purchases 2001 - 2010
(AF)

Imported Water	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Treated	26,070	33,765	32,190	41,312	29,921	35,969	47,479	38,858	34,289	29,864
Untreated [1]	19,997	15,078	15,953	16,765	15,661	17,259	16,398	12,003	16,223	12,187
Untreated [2]	-	-	3,079	4,065	2,077	5,661	3,702	2,604	2,806	3,939
Total	**46,067**	**48,843**	**51,222**	**62,142**	**47,659**	**58,889**	**67,579**	**53,465**	**53,318**	**45,990**

Source: RCWD Operations Department
[1] Used for groundwater recharge
[2] Used for flows to the Santa Margarita River under agreement with Camp Pendleton; began in 2003.

Western Municipal Water District

WMWD relies on three existing water sources – groundwater, imported water, and recycled water – to meet its wholesale and retail demands. WMWD obtains approximately 90 percent of its total supply through imported water sources from Metropolitan. About one-quarter of the imported water is from the CRA and about three-quarters from the SWP. About 60 percent of WMWD's water sales are for wholesale and the balance is for retail.

WMWD 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.[16] WMWD has a Purchase Order Commitment for 391,791 AFY.[17] Supplemental water may also be purchased from Elsinore Valley Municipal Water District and the City of Riverside, which operates a well water supply system of over 40 domestic quality wells. When surplus water is available from the City of Riverside, WMWD can take up to 4,900 gpm (2,000 AFY) on an emergency or off-season basis. WMWD and Elsinore Valley Municipal Water District (EVMWD) have a purchase agreement to pump non-potable water from wells in the San Bernardino/Riverside area and wheeled through canals and pipelines. This water is based on groundwater rights EVMWD holds in the Meeks and Daley Water Company. WMWD has the right to purchase up to 9.0 cfs (4,200 AFY) of groundwater, which makes more high quality imported water available for domestic purposes.

Groundwater is also a major source of water supply for WMWD and its retail agencies. Since late 2005, WMWD has been pumping a portion of its groundwater from the Murrieta-Temecula Basin as a result consolidation of the Murrieta County Water District into WMWD. While RCWD does not receive groundwater sources from WMWD, it does manage the Murrieta-Temecula Basin.

[16] Metropolitan bills customers on a tiered system; Tier 1 supplies are set at 90 percent 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.
[17] WMWD 2010 UWMP, p. 3-2, June 2011

WMWD currently supplies approximately 26,000 AFY, or 33 percent, of its total potable wholesale water deliveries to the District. The District receives no recycled water from WMWD.

Eastern Municipal Water District

EMWD's relies on imported water from Metropolitan for 80 percent of its potable supply. Treated water ready for potable use is supplied from the CRA and SWP through two Metropolitan water treatment facilities; the Henry J. Mills Filtration Plant, which treats water from northern California, and the Robert F. Skinner Filtration Plant, which treats a blend of CRA and SWP water for potable use.

In addition to treated water, EMWD utilizes untreated or non-potable water imported from Metropolitan. EMWD treats this water for potable use at a single microfiltration plant in Perris, CA, which allows EMWD to meet the needs of local customers when Metropolitan's treated water resource may be stretched to their limit, especially during peak summer months. Raw water from Metropolitan is also used for agricultural customers and for recharging the groundwater basins in the region.

In 2010, EMWD served approximately 151,050 AFY of total water to retail and wholesale water users. This total includes 108,200 AFY of potable water and 43,000 AFY of non-potable. Of this total, EMWD supplied RCWD with nearly 26,000 AF of potable water and 2,016 AF (1.8 MGD) of recycled water. RCWD has the contractual right, if it develops facilities to utilize the additional recycled water to receive up to 5.0 MGD (an additional 3,584 AYF).

3.2.2 Groundwater – Murrieta-Temecula Basin

The Basin includes two aquifers, the Pauba aquifer and the Temecula aquifer, which also include eight underlying groundwater basins, which are based upon surface water hydrology subbasins. Total natural safe yield of the Basin is estimated at 34,400 AFY, and continues to be evaluated.

The Pauba aquifer, covering approximately 18 square miles, has a storage capacity estimated at 200,000 AF. The Pauba aquifer is underlain by the confined Temecula aquifer. The Temecula aquifer, approximately 100 square miles, is believed to have a storage capacity estimated at 2 MAF, although estimates vary widely. In 1975, DWR estimated groundwater storage within both the Pauba and Temecula aquifers at approximately 253,000 AF. Unused storage is estimated at 250,000 to 500,000 AF.

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 (Judgment) entered on April 6, 1966 by the U.S. District Court. The Modified Final Judgment incorporates the 1940 Stipulated Judgment and several subsequent orders have been entered that provide provisions for administering the water rights and managing surface water and groundwater resources in the watershed. The subsequent orders include

the Cooperative Water Resource Management Agreement between the District and Camp Pendleton for management of groundwater and maintenance of surface water flows. Other governance documents include Permit 7032 issued by the State Resources Water Control Board for water rights to Vail Lake and a recently adopted agreement between the District and the Pechanga Band concerning groundwater management for the Wolf Valley subbasin.

In March 1989, the Court appointed a Watermaster to administer and enforce the provisions of the Judgment and subsequent orders of the Court. The Court also appointed a Steering Committee that is currently comprised of representatives from the United States, EMWD, WMWD, FPUD, Metropolitan, the Pechanga Band, and the District. The purpose of the Steering Committee is to assist the Court and the Watermaster in administering the water rights. The Basin governing agencies and their roles are presented in Table 3.2-3.

Table 3.2-3
Management Agencies in the Murrieta-Temecula Basin

Agency	Role/Responsibility
Santa Margarita River Watershed Watermaster	Court-appointed 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	Prepare Groundwater Audit and a Recommended Groundwater Production Report for operation of District groundwater wells and recharge facilities

In addition, the District prepares an annual Groundwater Audit and a Recommended Groundwater Production Report (RGPR). 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.

The Basin is adjacent to the Elsinore Basin. When groundwater levels are above 1,100 feet mean sea level (MSL) in the southeastern portion of the Elsinore Basin, small amounts (less than 100 AFY) of groundwater could spill into the adjacent Murrieta-Temecula Basin. Current water levels are substantially below this level, and there are no agreements regarding this potential flow.

Groundwater basin inflows occur through a variety of processes:

- Areal recharge - deep percolation of direct precipitation on the ground surface that eventually recharges the aquifers within the basins
- Return flow - portion of water applied to the ground surface that reaches the groundwater as a result of deep percolation; sources of return flow include agricultural, domestic, and commercial irrigation

- Stream percolation - the stream loses water to the aquifer because of a higher hydraulic head in the stream than in the aquifer
- Underflow - flow from one basin to another
- Artificial recharge – spreading imported water at the Valle del los Caballos (VDC) spreading basins

A real recharge, return flow, stream percolation and underflow are classified as "natural inflow". According to the District's groundwater model, the average natural inflow for all eight basins is 41,000 AFY when no artificial recharge is occurring. Figure 3-1 presents a historical view of the annual estimated natural inflow for all eight basins from 1935 to 1998. As shown, there are seven years in which the natural inflow exceeds 70,000 AFY. Most of the years of record, however, show natural inflow at approximately 30,000 AFY.

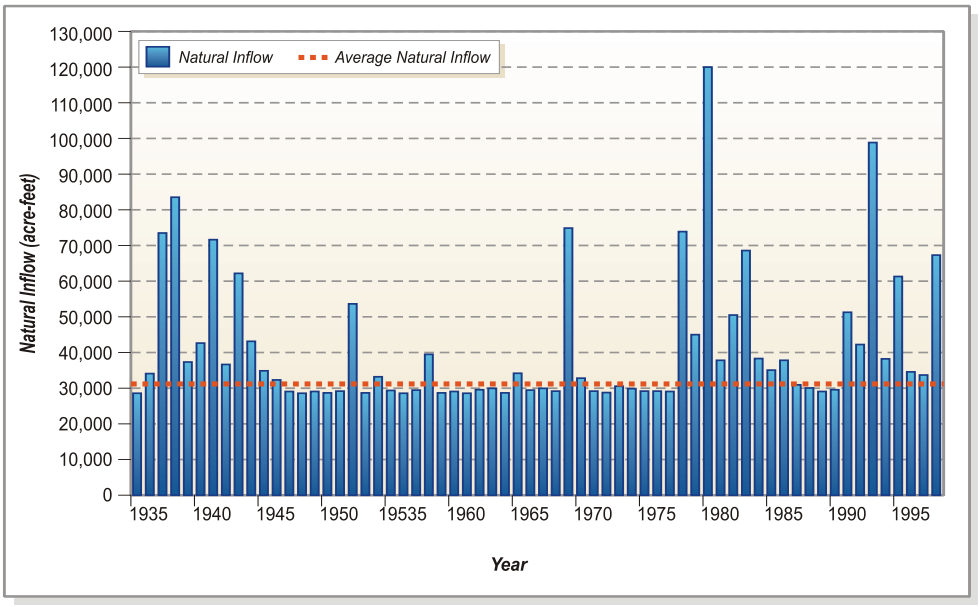

Figure 3-1
Natural Inflow for Groundwater Basins Used by RCWD

Natural basin outflows also occur in several ways:

- Evapotranspiration (ETo) - direct evaporation from surface water and bare soil as well as the transpiration of water by plants such that the water is not available for groundwater recharge
- Gaining streams – the stream gains water because the hydraulic head in the stream is lower than the head in the aquifer
- Underflow - flow from one basin to another

The average natural basin outflow for the Basin and its sub-basins from 1935 to 1998 was 6,600 AFY. The natural yield of the total basins equals the natural inflows less the natural losses, which would be 34,400 AFY (41,000 AFY less 6,660 AFY). However, others pump from the basins in addition to RCWD, including EMWD, Pechanga and other private pumpers. Accounting for these users, the total natural yield available to RCWD is currently approximately 29,500 AFY. However, RCWD anticipates supplementing the natural recharge with imported water recharge, thereby increasing the yield available to RCWD. This yield is estimated at 38,000 AFY beginning in 2015. Figure 3-2 shows the RCWD groundwater recharges areas and operating wells.

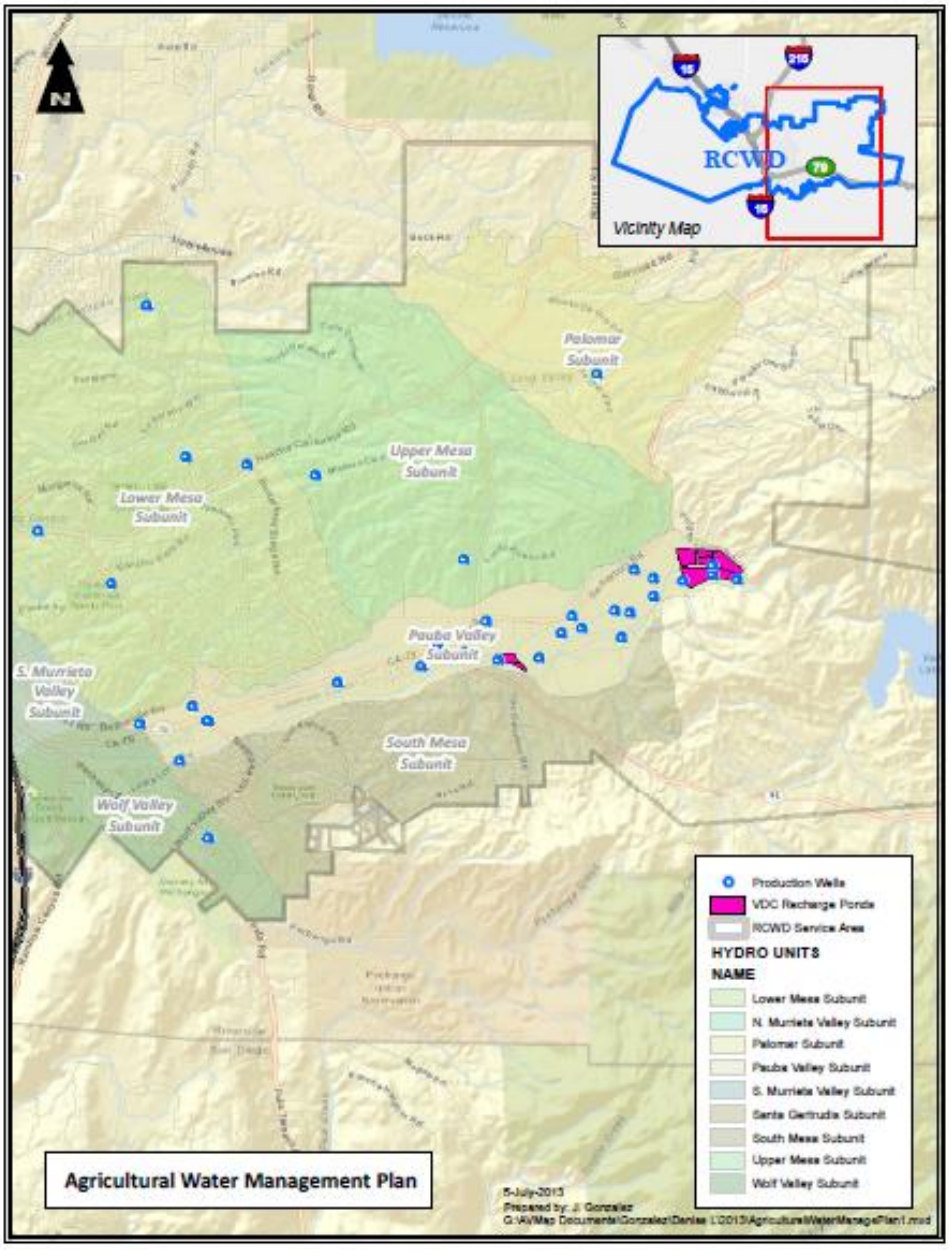

Figure 3-2

RCWD Groundwater Recharge Ponds and Operating Wells

The District currently maintains 52 wells, including inactive wells. Table 3.2-4 presents the District's current active wells and recommended production for FY 2011-2012. Production recommendations were based primarily on a review of individual well production and historical hydrographs, consideration of groundwater level elevations from all production and monitoring wells, information from hydrologic subareas and index wells[18] representing water level changes in the subarea, and RCWD staff input. In accordance with sound groundwater basin management practices, the recommended production is considered a guide and is subject to revision as additional data is available.

Table 3.2-4
RCWD Active Groundwater Wells

Well No.	Aquifer	Hydrologic Subunit	FY 2011-2012 Recommended Production (AF)
135	Temecula	N. Murrieta Valley	100
144	Temecula	N. Murrieta Valley	400
145	Temecula	N. Murrieta Valley	700
155	Temecula	N. Murrieta Valley	50
156	Temecula	N. Murrieta Valley	800
146	Pauba	N. Murrieta Valley	50
101	Temecula	S. Murrieta Valley	300
102	Temecula	S. Murrieta Valley	400
118	Temecula	S. Murrieta Valley	800
122	Temecula	Wolf Valley	500
211	Temecula	Wolf Valley	500
119	Pauba	Wolf Valley	500
205	Temecula	Santa Gertrudis	1,500
309	Temecula	Santa Gertrudis	3,000
106	Combined	Santa Gertrudis	200
108	Combined	Santa Gertrudis	600
128	Temecula	Lower Mesa	0
129	Temecula	Lower Mesa	0
138	Temecula	Lower Mesa	1,600
139	Temecula	Lower Mesa	1,200
140	Temecula	Lower Mesa	1,100
216	Temecula	Lower Mesa	250
235	Temecula	Lower Mesa	1,000
151	Temecula	Upper Mesa	600
215	Temecula	Upper Mesa	350
120	Temecula	Pauba	1,200
124	Temecula	Pauba	300
125	Temecula	Pauba	750
126	Temecula	Pauba	600
130	Temecula	Pauba	750
131	Temecula	Pauba	750

[18] Index wells are non-production monitoring wells having several years of historical water level data, reflecting changes in water levels in a subarea.

Well No.	Aquifer	Hydrologic Subunit	FY 2011-2012 Recommended Production (AF)
133	Temecula	Pauba	500
143	Temecula	Pauba	700
149	Temecula	Pauba	600
203	Temecula	Pauba	500
217	Temecula	Pauba	900
109	Pauba	Pauba	600
110	Pauba	Pauba	1,200
141	Pauba	Pauba	625
152	Pauba	Pauba	1,700
153	Pauba	Pauba	1,500
157	Pauba	Pauba	1,800
158	Pauba	Pauba	1,800
210	Pauba	Pauba	600
231	Pauba	Pauba	0
233	Pauba	Pauba	1,600
123	Combined	Pauba	150
132	Combined	Pauba	1,400
232	Combined	Pauba	1,200
234	Combined	Pauba	300
113	Temecula	Palomar	550
Total Recommended Production			**39,075**

Source: RCWD Recommended Ground Water Production, Fiscal Year July 1, 2011 through June 30, 2012, Geoscience Support Services, Inc., January 14, 2011

The District's 2005 Water Facilities Master Plan includes recommendations for well improvements to provide for system reliability and continued groundwater pumping. Construction of new wells to replace existing, older wells is anticipated, as well as additional wells for increased groundwater pumping. Evaluation of required wells is currently being conducted as part of the Upper Valle de Los Caballos Recharge/Recovery Optimization Study. The study will identify an optimal project that provides low-cost potable water in the RCWD service area through increased groundwater basin recharge and recovery.

Section 4, Water Reliability Planning, also includes these improvements. Table 3.2-5 presents the District's anticipated future wells and associated capacities.

Table 3.2-5
RCWD Future New Groundwater Wells – 2015 and Beyond

Project	Description	Est. Start Date	Est. Completion Date	Capacity (AFY)
New Groundwater Wells*	Eleven new groundwater wells for recovery of increased basin water from enhanced groundwater recharge	2015	2021	25,000

Source: RCWD Engineering Department

*An element of the Valle de Los Caballos Conjunctive Use Project; well locations are being determined in the 2011 Upper Valle de Los Caballos Recharge/Recovery Optimization Study.

Table 3.2-6 provides the amount and location of groundwater pumped for the last five years.

Table 3.2-6
Historic Amount of Groundwater Pumped from the Murrieta-Temecula Basin
(AF)

	2005	2006	2007	2008	2009	2010
Total	20,798	23,441	23,644	26,495	23,552	24,556

Note: Years are shown in fiscal years.

Considering historic pumping, recommended production for FY 2011-2012, and proposed future well development, Table 3.2-7 shows the projected amount of groundwater production through the years 2035. Well production for the 20-year planning period is projected to increase by 2015 to 38,000 AFY from the current amount of 24,500 AFY as a result of supplemental recharge from imported water.

Table 3.2-7
Total Projected Amount of Groundwater Pumping by RCWD
from the Murrieta-Temecula Basin
(AF)

25-Year Projections				
2015	2020	2025	2030	2035
38,000	38,000	38,000	38,000	38,000

Source: RCWD Operations Department

Note: Includes both native groundwater pumping and groundwater recharge with imported water.

Groundwater Recharge with Imported Water

In addition to the extraction of the natural yield of the basins, RCWD artificially recharges the Pauba Valley Basin with untreated imported water for enhanced groundwater production. RCWD purchases imported water from the Metropolitan and delivers it from the San Diego aqueduct turnout EM-19 to the VDC recharge basins. Between 2000 to 2010, imported water provided an average of 15,000 AFY of artificial groundwater recharge through the VDC recharge basins.

Groundwater Recharge from Vail Lake

RCWD stores local runoff in Vail Lake, which was created in 1948 through construction of Vail Dam on Temecula Creek. RCWD has a surface water storage permit in Vail Lake for up to 40,000 AF from November 1 to April 30. During these months, RCWD releases available water from Vail Lake to the VDC spreading basins, about 1.5 miles

downstream, for groundwater recharge. From May through October, existing State permits prohibit storage and require inflow to pass through Vail Lake to Temecula Creek. The amount of local runoff reaching the lake can vary widely depending on hydrological conditions. From 1962 to 2000, flows into Vail Lake ranged from 218 AFY to 29,570 AFY, with an average flow of 5,150 AFY. In 2005, flows were approximately 3,000 AF and in 2010 flows were 2,724 AF.

The storage capacity of the lake is approximately 49,370 AF, with a surface area of 1,070 acres at spillway elevation. Historically, RCWD used Vail Lake to store local runoff and now will be importing untreated Metropolitan-source water for storage, and subsequent groundwater recharge. The historical available storage of the lake has varied widely as well, including two periods when the reservoir was full in February 1980 and February 1993. The average available storage is approximately 30,900 AF.

Historical Annual Artificial Recharge and Pumping from Groundwater Basins

RCWD has increased groundwater production over the past 10 years to meet increased demands. Artificial recharge was 15,661 AF in 2005 and 12,187 AF in 2010, and is projected to increase to 23,000 AFY in 2015. After 1999, significant groundwater recharge from Vail Lake occurred in the following years: 2006, 2008, 2009, and 2010.

3.2.3 Desalted Water Opportunities

In times of water scarcity and an ever-growing demand for fresh water due to population growth, and given current climate trends, water resources will become even more unevenly distributed as water-scarce regions experience more frequent and prolonged droughts. Desalination can be a reliable water supply alternative and a part of the solution for meeting current and future water needs.

Desalination began in California in 1965. The past ten years has seen a rapid rise in installed capacity. This is primarily due to dramatic improvements in membrane technology and the increasing cost of conventional water supply delivery. As of 2009, there were 26 desalting plants operating in California that provide water for urban use. The total capacity of these plants is approximately 84,000 AFY from 20 groundwater and six seawater desalination plants.

Desalination is viewed as a way to develop a local, reliable source of water that assists agencies reduce their demand on imported water and make unusable groundwater available for municipal uses.

Desalination, when adopted as part of a diversified water supply portfolio, can offer several benefits including the following:

- Increase in water supply
- Reclamation and beneficial use of impaired waters
- Increased water supply reliability during drought periods

- Decreased need for imported water by developing a local supply source
- Diversification and increased reliability and operational flexibility of water supply sources
- Improved potable water quality
- Protection of public health
- Facilitate more recycling and reuse, given the lower salinity of the source

Department of Water Resources Proposition 50 Funding and IRWM Planning

Proposition 50, the Water Quality, Supply and Safe Drinking Water Projects, Coastal Wetlands Purchase and Protection Act (Prop 50), was passed by voters in 2002. Proposition 50 provided $3.44 billion through the sale of general obligation bonds for a variety of water projects including coastal protection, the CALFED Bay-Delta Program, integrated regional water management, safe drinking water, and water quality. Prop 50 specifically provided $500 million to fund competitive grants for projects consistent with an adopted integrated regional water management (IRWM) plan. Proposition 84, the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act, passed by voters in 2006, also provides $1 billion for IRWM planning and implementation projects.[19]

Projects eligible for the funding include construction projects, research and development, feasibility studies, pilot projects, and demonstration programs, including brackish and ocean desalting projects.

In January 2005 and 2006, DWR competitively awarded $50 million of desalination grants to 48 projects including 7 construction projects, 14 research and development projects, 15 pilot and demonstration projects, and 12 feasibility studies through the Proposition 50 DWR Water Desalination Funding Program. No additional funding cycles were made available through Proposition 84. Local agencies, water districts, academic and research institution are using the funds in the development of new water supplies through brackish water and seawater desalination.

As a resource management strategy, desalination must be evaluated by the integrated regional water management[20] (IRWM) planning region[21] as a method to meet their water resource management goals and objectives of the region. In an IRWM region where desalination has been determined to be an active strategy within its water resource

[19] Proposition 84 did not specifically fund the DWR Water Desalination funding program, but did allow desalination projects in the IRWM funding as long as the project has multiple benefits.

[20] DWR defines integrated regional water management as a collaborative effort to manage all aspects of water resources in a region, crossing jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions.

[21] The Upper Santa Margarita Watershed Planning Region prepared and adopted, through a comprehensive stakeholder process, the 2007 Upper Santa Margarita Planning Region Integrated Regional Water Management Plan. RCWD is a stakeholder in the region's IRWM Plan.

management portfolio (to further the goals of the plan), opportunities for funding for desalination projects may be available through IRWM grants.

As regional and local brackish water and seawater desalination projects are developed throughout California, reliability of water supplies will be enhanced through the development of new water supplies, including groundwater. This new water supply frees up available imported water supplies to agencies, including the RCWD, that do not have the ability to benefit from the use of ocean desalination, but instead rely on imported water for supplemental supply.

Metropolitan's Seawater Desalination Program

In August 2001, Metropolitan launched its Seawater Desalination Program. The program objectives were to provide financial and technical support for the development of cost-effective seawater desalination projects that will contribute to greater water supply reliability. Metropolitan's Integrated Water Resources Plan (IRP) 2010 Update includes a target of 150,000 AFY for seawater desalination projects sustained production to meet future demands. Through a competitive process, selected projects will be eligible for financial assistance up to $250 per AF of produced water. Metropolitan's call for proposals under the Seawater Desalination Program produced five projects by member agencies. Currently, the five projects under consideration that (if constructed) could produce about 166,000 AFY include the following:

- Carlsbad: A 50 MGD plant located adjacent to the AES power plant is planned for construction by Poseidon Resources.
- Huntington Beach: A 50 MGD plant located adjacent to the AES power plant is planned for construction by Poseidon Resources.
- Dana Point: A 20 MGD plant is proposed by the Municipal Water District of Orange County. A feasibility study is underway that includes testing a seawater well intake and a possible seawater reverse osmosis pilot test project.
- Long Beach: a 9 MGD plant is proposed by the Long Beach Water Department to use a unique two-staged nanofiltration membrane process design. Pilot testing has been underway since 2001.
- West Basin: A 20 MGD plant is proposed by West Basin Municipal Water District; pilot testing has been underway since 2002.

This additional source of water supply would provide greater water reliability for Southern California residents, including residents in the District's water service area. Metropolitan continues to work with its member agencies to develop local projects, inform decision makers about the role of desalinated seawater on future supplies, and secure funding from various state and federal programs.[22]

[22] Metropolitan Water District of Southern California, Regional Urban Water Management Plan, November 2010

3.2.4 Recycled Water

In California, 43 wastewater treatment facilities discharge approximately 1.35 billion gallons daily (~1.5 million AFY) of treated effluent directly into the Pacific Ocean. These facilities reclaim or divert for reclamation only approximately 312 million gallons daily (MGD) (~ 200,480 AFY) for beneficial reuse. Based on the volume discharged daily by the 43 facilities, about four times more than this amount could be reclaimed. The Southern California region alone, from Ventura to San Diego, discharges over 1.2 billion gallons (~1.4 million AFY) of treated wastewater to the ocean each day.[23]

Recycled water supplies represent nearly seven percent of the total water demand in the RCWD service area and are anticipated to increase in the 25-year planning period. Recycled water used in the RCWD service area is produced from two facilities, the Santa Rosa Water Reclamation Facility (SRWRF) operated by the District, and the Temecula Valley Regional Water Reclamation Facility (TVRWRF) operated by EMWD.

RCWD and EMWD are working cooperatively to achieve maximum reuse of all available recycled water. Development of local recycled water facilities will be the key to expanding the direct use of recycled water. In order to deliver the ultimate demand from EMWD for recycled water, additional pipelines, reservoirs, booster stations, and land parcels will be required.[24]

Recycled water is considered a reliable and drought-proof water source and could greatly reduce reliance on imported water for the District and in the region. As technological improvements continue to reduce treatment cost, and as public perception and acceptance continue to improve, numerous reuse opportunities are developing.

Both the SRWFR and TVRWRF treat wastewater to Title 22 standards. The District is maximizing recycled water from these two plants to meet landscape irrigation demands. Additional recycled water from the TVRWRF could be used if advanced treatment beyond Title 22 standards was applied. As a result, not all of the recycled water from the TVWRF is beneficially used and must be discharged to Temescal Creek.

Seasonal storage ponds near the SRWRF store effluent during the winter months (low demand period) to prevent discharges and provide recycled water supply to meet peak summer demands. The current pond storage is approximately 1,100 AF, with an expected ultimate capacity of 2,700 AF.

Recycled water use for 2010 was 4,367 AF, increasing to 4,800 AFY by 2035, as shown in Section 2, Water Demands, and 4.2, Demands and Supplies Comparison. The District also supports efforts to utilize recycled water as a resource for groundwater recharge in the Murrieta-Temecula Groundwater Basin.

[23] California Ocean Wastewater Discharge Report and Inventory, Heal the Ocean, March 15, 2010
[24] EMWD 2010 UWMP, June 2011

Recycled water availability for the region, is not dependent on climatic conditions, but is dependent on available infrastructure to develop and deliver this water resource. Available recycled water supply is projected to meet, and in fact exceed, demand in all hydrologic conditions as discussed in Section 4 and Section 8.

Recycled Water Supply

RCWD has a substantial investment in recycled water as demonstrated by the increase in recycled water deliveries from 1,698 AF in 1995 to 4,367 AF in 2010. Since Gross Water Use subtracts out all recycled water, it thereby recognizes its benefits explicitly. Implementation of additional recycled water will further progress towards the 2020 goal.

The District's 2010 Strategic Plan, Objective B is to "*Implement a long-term plan for wastewater treatment and water recycling that maximizes recycled water use."* Additionally, the District's Mandatory Recycled Water Use Policy provides a mechanism to mandate the use of recycled water for landscape irrigation for new development projects, as well as the retrofit of existing landscape irrigation sites under specific criteria. While the District does not currently have a mandate in place, it is pursuing one of the initiatives of Objective B to encourage recycle water site retrofits for use of additional recycled water. Further, the District maintains a financing policy for voluntary and mandatory recycled water site retrofits.

The District's Recycled Water System is being expanded through implementation of the District's Water Facilities Master Plan. The SRWRF is anticipated to supply additional recycled water of approximately 280 AFY by 2015 and an additional 560 AFY by 2020, for a total of 840 AFY, due to growth. The District, through implementation of the Strategic Plan, the mandatory recycled water use policy, and financing policy, is working to develop sites for use of this recycled water.

Regional Integrated Resources Plan – Deducting Recycled Water Used for Indirect Potable Reuse

The District is also working cooperatively with EMWD to secure additional recycled water supplies from their sewer service facilities into the District's service area. Under a series of prior agreements with EMWD involving the provision of wastewater service and use of recycled water, RCWD currently receives 1.8 million gallons per day (MGD) or 2,017 AFY from EMWD's Temecula Valley Regional Water Reclamation Facility and has the contractual right, if it develops facilities to utilize the additional recycled water, to receive up to 5.0 MGD (an additional 3,586 AFY). Negotiations are currently in progress related to possible additional amounts of recycled water from EMWD. The District has, as part of its Integrated Resource Plan, evaluated alternative recycled water expansion projects to utilize this additional water supply. Based on this evaluation, the District is moving forward with efforts to develop and permit an indirect potable reuse (IPR) project that would utilize available additional recycled water for reservoir and groundwater recharge. SBx7-7 allows urban retail water suppliers to calculate a deduction for recycled water entering their distribution system indirectly through a groundwater source.

The IPR technique is one of the recycled water applications that have developed in recent years, largely as a result of advances in treatment technology and regulatory achievements that enable the production of extremely high quality recycled water at increasingly reasonable costs and reduced energy inputs. In IPR, tertiary treated recycled water is further treated through reverse osmosis, ozone, and ultraviolet disinfection and utilized as a high-quality, low-salinity water source for groundwater or reservoir recharge with the intent of augmenting drinking water supplies. IPR is a feasible option for the sustainable management of water because it is a water supply alternative not dependent on rainfall and it is possible to achieve high quality recycled water in compliance with regulatory standards and guidelines.

In 2007, the IPR project was included as an alternative evaluated in the District's RCWD Regional Integrated Resources Plan (IRP). From the IRP, the District investigated the use of treated and demineralized wastewater for agricultural supply in the Santa Rosa Division, and raw untreated imported water in the eastern Rancho Division. As a result, the Demineralization and Non-Potable Water Conversion Feasibility Report (July 2007, Carollo) was prepared, which studied a series of technically innovative approaches for demineralization of wastewater and the associated disposal of reject brine. In 2010, an update to the 2007 Feasibility Report (June 2010, Corollo) was prepared, which presents treatment alternatives, and updated cost and avoided cost estimates. The IPR project was included in the 2010 analysis, which concluded that the IPR project is a viable and economic option for the use of recycled water at the feasibility level of analysis. Further advanced engineering planning analysis is necessary, particularly in the area of brine management and disposal, to advance the IPR project alternative to a preliminary design stage and allow development of a project concept, environmental documentation to consider project alternatives, and necessary permitting, design and construction. It is anticipated that the IPR project would be implemented between 2019 and 2021.

3.2.4.1 Coordination of Recycled Water in Service Area

Recycled water planning within the RCWD service area requires close coordination with several agencies. RCWD has developed a Regional IRP in 2007 that evaluated alternatives to increase recycled water within RCWD's service area. As noted in an earlier section, RCWD and EMWD are working cooperatively to achieve maximum reuse of all available recycled water. Development of local recycled water facilities will be the key to expanding the direct use of recycled water and deliver the ultimate recycled water demand.

Additionally, the Santa Margarita Water Supply Augmentation Study was conducted in 2005 by RCWD, EMWD, and the U.S. Bureau of Reclamation. This study examined the feasibility of advanced treatment using MF/RO to increase the usability of recycled water from EMWD's recycled water plant and determined it as a viable treatment alternative.

3.2.4.2 Wastewater Collection and Treatment

Wastewater in the upper Santa Margarita watershed is collected by sewer system in the more densely populated areas and by septic systems in the rural areas. RCWD and EMWD both collect wastewater within the RCWD water service area and treat it at their respective water reclamation facilities: the SRWRF, operated by RCWD; and the TVRWRF, operated by EMWD.

Table 3.2-8 summarizes the past, current, and projected average dry weather wastewater volumes collected and treated to recycled water standards for treatment plants within RCWD's service area. Between 2010 and 2035 the average wastewater collected between the two treatment plants is expected to increase approximately 60 percent from 24,810 mgd to 39,521 mgd. The entire amount of wastewater collected is expected to meet recycled water standards. Utilization of treated effluent for recycled water use is projected to increase from 36 percent in 2005 to 79 percent in 2030.

Table 3.2-8
Wastewater Collection and Treatment – 2005 to 2035
(MGD)

Plant	2005	2010	2015	2020	2025	2030	2035
Average							
SRWRF	4,148[1]	3,080[1]	4,510[2]	4,906[2]	4,906[2]	4,906[2]	4,906[2]
TVRWRF	16,200[3]	21,730	23,411	25,090[4]	27,470	29,850	34,615[4]
Total	20,348	24,810	27,921	29,996	32,376	34,756	39,521
Quantity Meeting Tertiary Recycled Water Standards	20,348	24,810	27,921	29,996	32,376	34,756	39,521

Source: RCWD Engineering Department

[1] Recorded actual flow.

[2] RCWD projections using 200 gpd/EDU and build out assumed by 2020.

[3] EMWD 2006 Wastewater Master Plan Update reported flow figure for 2007.

[4] EMWD 2006 Wastewater Master Plan Update and assumption that build out by 2035.

All recycled water must meet Title 22 standards. Title 22, Chapter 4, of the California Code of Regulations establishes recycled water quality standards and treatment reliability criteria dependent upon the end use of recycled water to protect public health. Both secondary and tertiary treated wastewater can meet Title 22 standards dependent upon the end use of the water. Recycled water produced in excess of demands is exported and eventually ends up in the ocean.

Table 3.2-9 shows the SRWRF does not discharge effluent, rather all water is treated to Title 22 standards and either immediately used or stored for future use. All effluent at TVWRF is treated to Title 22 standards, and portions of the effluent that are not used immediately or stored are discharged to Temescal Creek and ultimately the Pacific Ocean.

Table 3-2.9
SRWRF Wastewater Treatment and Disposal
(AF)

Plant	Treatment	Disposal Method	2005	2010	2015	2020	2025	2030	2035
SRWRF	Title22	All Recycled Water Used	0	0	0	0	0	0	0

Santa Rosa Water Reclamation Facility

SRWRF has a current capacity of 5 mgd or approximately 5,598 AFY. The plant collects flow from areas within portions of RCWD's service area, WMWD, and a portion of Elsinore Valley Water District (EVMWD). The WMWD area (previously the Murrieta County Water District) is expected to have the greatest population growth leading to an increase in flows and the portion of EVMWD's service area served by this facility is expected to have the least growth. Total projected wastewater flows are projected to increase by approximately 20 percent by 2020.

All recycled water produced at this plant is currently reused for landscape irrigation. Seasonal storage ponds near the SRWRF store effluent during the winter months (low demand period) to prevent discharges and provide reclaimed water supply to meet peak summer demands. The current pond storage capacity is approximately 1,100 AF, with an expected ultimate capacity of 2,700 AF.

Temecula Valley Regional Water Reclamation Facility

The TVRWRF treats wastewater from a service area which includes the "Golden Triangle" region between Interstates 15 and 215, the Murrieta Hot Springs area, and portions of the Rancho Division of RCWD. The TVRWRF may also receive and treat wastewater generated in WMWD and EVMWD service areas.

The most current information available for the TVRWRF was included in RCWD's 2005 AWMP, as presented below. EMWD has not updated the information in their 2010 AWMP.

Projected wastewater flows will increase for the TVRWRF most dramatically from EMWD. Between 2007 and 2035, total flows will increase more than twofold from 16,200 AFY to 34,615 AFY, respectively.

Effluent from TVRWRF is conveyed to on-site storage ponds prior to distribution. There are 225 million gallons (MG) of temporary on-site storage capacity. When additional storage is required, recycled water is conveyed to 450 MG storage ponds located 10 miles north in Winchester, providing recycled water supply for irrigation users along the way. When the ponds are full or there is not enough demand, the effluent is discharged to

Temescal Creek, a tributary of the Santa Ana River, for ultimate disposal to the Pacific Ocean.

Recycled water produced by the TVRWRF is currently distributed to a variety of users, including users in the RCWD service area. From 1999 to 2003, effluent use on average was 256 mgd, with summer peaks increasing each year from about 400 mgd in 1999 to about 650 mgd in 2003.

3.2.4.3 Current and Projected Recycled Water Use in the RCWD Service Area

Historically, recycled water has provided less than 5 percent of total water supply for RCWD, while groundwater has supplied between 25 to 40 percent and imported water has supplied between 60 to 70 percent. In 2010, the total recycled water used was 4,367 AF. A near-term projection of additional recycled water supply availability is 500 AFY, based on current quantities of recycled water production/supply compared to sales. The District is currently preparing to launch a program to determine the most economical recycled water site retrofit projects to target with the goal of expanding the District's recycled water user base in a programmatic approach.

Water quality concerns in the Santa Margarita River Watershed prevent RCWD from discharging recycled water (Title 22) to the local streams. At the same time, the District needs to comply with legal requirements for flow to downstream users. Currently, raw imported supply has been used to meet flow requirements, while the effluent from the reclamation facilities is utilized for irrigation and other uses.

The SRWRF currently recycles all of its reclaimed water. Its recycled water is used solely for landscape irrigation. When supplies exceed demands, typically during the winter months, excess supplies are stored for use during the summer months when demand is higher. The ponds have a storage capacity of approximately 1,100 AF with an expected ultimate capacity of 2,700 AF.

Effluent from TVRWRF is conveyed to on-site ponds with 225 MG (675 AF) of capacity, prior to distribution. There is an additional 450 MG (1,381 AF) of storage available north of Winchester, and recycled water supply is provided for irrigation along the way. When the ponds are full or there is not enough demand, the effluent is discharged to Temescal Creek (which ultimately enters the Pacific Ocean via the Santa Ana River).

Tables 3.2-10 summarize current compared to 2005 projections, and projected recycled water use through 2035.

Table 3.2-10
RCWD Current, Estimated, and Projected Recycled Water Use
(AF)

	2010		2015	2020	2025	2020	2035
	Projected in 2005	Actual Use					
All Users	7,890[1]	4,367	4,900	5,200	5,200	5,200	5,200

[1] 7,700 AF for landscape and 190 AF for agriculture

Note: Projections for 2015 through 2035 are consistent with Section 4, Table 4.2-4; projections include water conveyed outside the RCWD service area (400 AFY – Table 2.1-3).

Table 3.2-11 summarizes the type of current recycled water use (about 171 user connections) in the District.

Table 3.2-11
2010 RCWD Recycled Water Use
(AF)

Current Recycled Water Use	2010 Demand
Golf Courses	2,282
Landscape Irrigation	1,858
Residential Irrigation	80
Agricultural Irrigation	74
Construction	73
Total Recycled Water Use	**4,367**

Source: RCWD Finance Department, Usage Report

3.2.4.4 Potential Uses of Recycled Water

The District recognizes the potential uses of recycled water in its service area, such as landscape irrigation, parks, industrial and other uses, and is working to develop the needed recycled water infrastructure to support use of recycled water.

Potential recycled water user categories that the District supports include the following:

- Landscape Irrigation: The greatest number of primary recycled water users in the region.
- Industrial Reuse: Limited opportunities due to small amount of industrial customers.
- Agricultural Irrigation: Limited opportunities due to small degree of recycled water infrastructure.
- Groundwater Recharge: Opportunity for 3,586 AFY for groundwater recharge and indirect potable reuse.

Potential recycled water uses in the RCWD service area as of 2010 are shown in Table 3.2-12. The quantity of potential recycled water use in the RCWD service area is recognized to be greater, although is under study at this time. The study results will

provide potential recycled water uses identified in the future independent of water quality requirements or availability of recycled water supply.

While RCWD's current agreement with EMWD is for 5 MGD of recycled water, the potential for additional recycled supplies to RCWD is possible. RCWD's service area within the TVRWRF generates more than 5 MGD of wastewater, and RCWD is interested in additional quantities of recycled water from the EMWD TVRWRF above the 5 MGD agreement. Discussions with EMWD are ongoing.

Table 3.2-12
Potential Recycled Water Uses
(AF)

User type	Treatment Level	2015	2020	2025	2030	2035
Groundwater Recharge[1]	MF/RO[2]	0	5,604	5,604	5,604	5,604
Landscape, agriculture	Title 22	4,800	5,200	5,200	5,200	5,200
Total		4,800	10,804	10,804	10,804	10,804

Source: RCWD Engineering Department
[1] Recycled water from EMWD for groundwater recharge for indirect potable reuse.
[2] MF/RO = microfiltration/reverse osmosis

3.2.4.5 Encouraging Recycled Water Use

The District is encouraging recycled water use by potential recycled water users through a variety of measures. To ensure that recycled water continues to be used to the fullest extent possible, RCWD uses five methods to expand the use of recycled water within its service area. These methods include the following:

Strategic Plan Objective: RCWD 2010 Strategic Plan, Objective B states that the District will "Implement a long-term plan for wastewater treatment and water recycling that maximizes recycled water use." Objective B includes an initiative to encourage recycled water site retrofits.

Mandatory Recycled Water Use Policy (Resolution 2007-10-5): RCWD adopted a policy requiring the use of recycled water for landscape irrigation for new development projects, as well as retrofit of existing landscape irrigation sites under specific criteria, and when recycled water is available.

Water Supply Assessments: RCWD Water Supply Assessment conditions all major new developments to use recycled water as a condition of service where it is available and permitted.

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

Financing Policy (Resolution 2007-10-5): RCWD adopted a financing policy for recycled water retrofits, which defines District-sponsored financing for both voluntary and mandatory recycled water retrofits. RCWD will assist private parties to arrange

financing for construction of facilities needed to convert potable demands to recycled water.

Public Education: RCWD actively promotes the use of recycled water with its water education program. RCWD also places prominent signage at public recycled water use sites promoting the benefits of water recycling.

RCWD does not have current data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for customers to use recycled water in-lieu of potable water. As growth continues within the RCWD service area, it is reasonable to assume that the mandatory provision of the District's Recycled Water Use Policy will play a major role in program expansion.

3.2.4.6 Optimizing Recycled Water Use

Recycled water is a sustainable and reliable water supply. Available supplies increase with an increase in population. Over the next 25 year planning horizon, recycled water use projections show that municipal and agricultural use will remain relatively constant. However, additional steps are being taken to increase recycled water use to maximize available supplies.

RCWD plans to take a variety of actions to facilitate the use and production of recycled water within RCWD's service area to increase potential recycled water use. These actions include:

- Implement a Recycled Water Site Retrofit Program with the following objectives: optimize existing and potential recycled/non-potable water supplies; expand and maximize the District's recycled water user base; establish a program structure that facilitates recycled water retrofits in a proactive manner; and establish a prioritized implementation strategy for near-term and future recycled water site retrofits.
- Install an MF/RO facility to add approximately 3,586 AFY (3.2MGD) of recycled water for groundwater recharge.
- Continue negotiations with EMWD for additional recycled water supplies.
- Apply for state and federal grant funding as available.
- Encourage Metropolitan to participate in studies that will benefit recycled water production.
- Support Metropolitan in deriving solutions to regulatory issues related to recycled water use.

3.2.5 Transfer and Exchange Opportunities

Water transfers are a water management concept with great potential for helping to alleviate water shortages in the region and Santa Margarita Watershed. The concept is that two agencies, one willing seller of water and one willing buyer, can enter into an exchange agreement that is mutually beneficial from a water management point of view. Water transfers allow an agency to "move" water from one service area to another, even when the two agencies are not connected by any pipelines.

As a water management tool, water transfers can be effective during periods of severe drought or emergencies. Water transfers can take multiple forms to increase water supply reliability among agencies.

During development of the RCWD 2005 IRP, RCWD investigated obtaining water transfers to bolster supplies. The IRP examined wet water transfers and dry water transfers, the difference being that wet water transfers occur in years of above normal rainfall and dry water transfers occur in years of below normal rainfall. The IRP recommendations allow for the possibility of such transfers to be executed should RCWD and its customers deem them cost-effective.

Additionally, local water agencies have the ability to enter into contracts between each other to provide water on an annual basis or on an as needed basis. The District is currently developing an agreement for the installation of two emergency interconnections with EMWD to be operated during periods of system failure. These interconnections will not function to provide water on an annual basis. One connection currently exists with EMWD and could provide a nominal supply, but flow rate would not suffice for any significant emergency.

Water is also provided by EMWD to RCWD on an annual basis for the wheeling of water to the following EMWD's water customers: Nakayama Park, Lake Skinner Park, and Glen Oaks. Similarly, water is provided by WMWD to RCWD on an annual basis for wheeling water to WMWD's water customer, Rock Mountain. These arrangements are shown in Table 4.2-2.

3.2.6 Planned Water Supply Projects and Programs to Meet Projected Water Use

Rancho California Water District

RCWD's 2007 Regional IRP was prepared to assist the District in developing a long-term water supply strategy that can meet demands now until 2050. The IRP was developed using a multi-objective approach, integrating both demand and supply-side options.

The approach first developed and weighed key objectives, which along with associated performance measures, was used to evaluate alternatives to meet future demands (Figure

3-3). The objectives and performance measures developed for the IRP are summarized in Figure 3-4.

Over a dozen alternatives were evaluated using a systems model called STELLA. The model was able to simulate demands and supplies (existing and potential) under different climate and hydrologic scenarios, as well as identify distribution constraints. The model

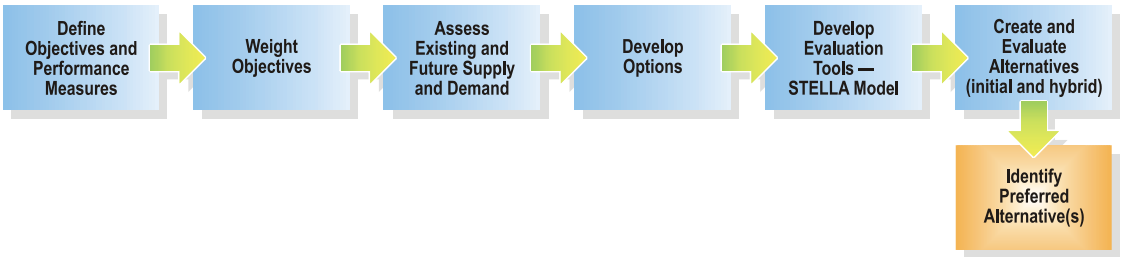

Figure 3-3
RCWD's IRP Process

was also able to simulate water quality, storage conditions in the groundwater basins and Vail Lake, and estimate the total cost (capital and O&M) for any potential supply or demand-side management option(s).

The output from the model was used along with the objectives in Figure 3-4 to develop a comprehensive score card for each alternative. RCWD weighed the objectives in terms of relative importance in order to rank the IRP alternatives. The preferred plan, called Hybrid 1, includes the following components:

1. Implement baseline water conservation measures.
2. Connect imported water connection EM-21 to Vail Lake to expand groundwater recharge.
3. Convert eastern area agriculture, currently using treated imported water, to raw water, delivered from Vail Lake.
4. Construct up to 18 new groundwater wells, along with increased imported water for recharge during non-drought years.
5. Construct a MF/RO treatment facility to reduce the salinity of recycled water so that it can be used to meet western area agricultural demands, as well as potential groundwater replenishment in the future.

The benefits of the preferred IRP Hybrid 1 alternative are:

- Increased groundwater production of about 18,000 AFY.
- Increased use of recycled water of about 13,600 AFY.
- Reduction in peaking on Metropolitan by about 144 cubic feet per second (cfs).
- Cost efficiency by: (1) converting eastern area agricultural users from treated imported water to untreated, (2) reducing the peaking charge paid to

Metropolitan, and (3) by maximizing Metropolitan's discounted replenishment water rate for groundwater recharge.

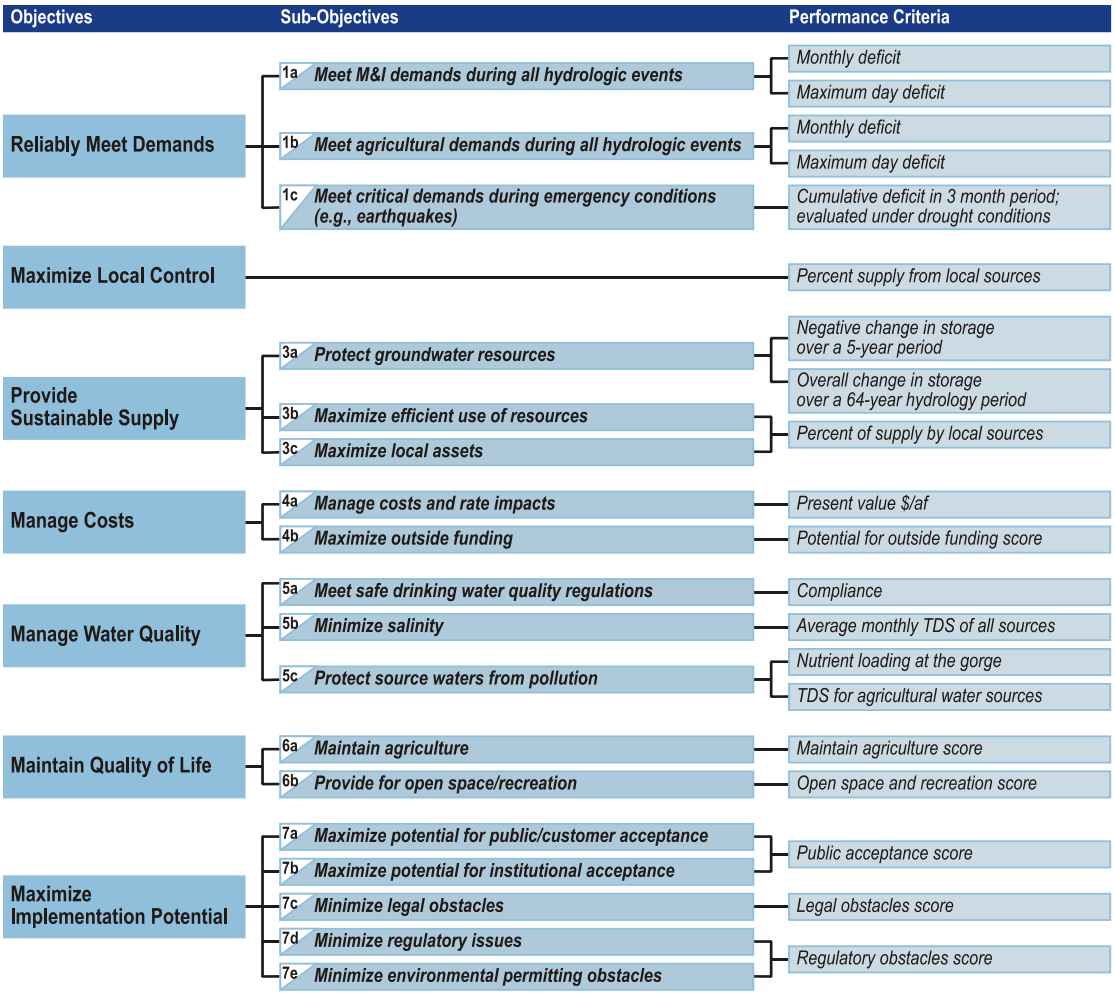

Figure 3-4
IRP Objectives, Sub-Objectives and Performance Measures

Although the conversion of eastern area agricultural demands from treated to raw imported water is beneficial in terms of meeting peak day demands and reducing costs to RCWD, it does not produce "new" wet water supply. However, the construction of 18 new groundwater wells and a MF/RO treatment facility does produce additional water supply.

Because demands and supplies vary from year to year due to weather and hydrologic conditions, it is also important to plan for this variation. Because of the semi-arid climate of RCWD's service area, water demands can be as much as 9 percent greater than normal during dry years and 15 percent lower during wet years.

Groundwater pumping can also vary due to hydrologic conditions. Based on RCWD's groundwater model, groundwater production from new wells is expected to average

18,000 AFY. But in dry and critically dry years, groundwater production can be as low as 15,000 AFY. With the development of new wells as part of the Valle de Los Caballos Conjunctive Use program, an additional 25,000 AFY is projected.
The District identifies recommended water improvements in its 5-year Capital Improvement Program (CIP). The 5-year CIP is updated annually in consideration of the District budget and project priority.

Recommended system improvements to ensure the reliability of the potable water supply and for sustainable supply to meet future demands are listed in Table 3.2-13. These projects are currently in planning stages for subsequent design and construction.

Table 3.2-13
Planned Water Supply Projects

Project Title	Project Description	Est. Start Date	Est. Complete Date	Additional Supply
Vail Lake Stabilization and Conjunctive Use Project	Construction of Vail Lake Transmission Main and Pump Station to convey untreated imported water to Vail Lake for storage and subsequent groundwater recharge through the VDC Recharge Basins	In progress	2012	4,521 AFY
Valle de los Caballos Conjunctive Use Project	Construction of conveyance pipeline and treatment facilities for increased raw imported water through the VDC Recharge Basins	2015	2018	25,000 AFY
New Groundwater Wells	Construction of 11 new groundwater water wells for recovery of increased groundwater recharge	2015	2021	Included with Valle de Los Caballos Conjunctive use project
Indirect Potable Reuse Facility	Construction of treatment and conveyance facilities for production of desalinated treated water for storage in Vail and subsequent ground water recharge in the Pauba Basin	2014	2018	3,586 AFY

Source: RCWD Regional IRP, October 2005 and RCWD Engineering Staff

Metropolitan Water District of Southern California

As two of Metropolitan's 26 member agencies, EMWD and WMWD receive supplemental imported water from Northern California through the SWP and the Colorado River through the CRA. As a water wholesaler, Metropolitan has no retail customers, and distributes treated and untreated water directly to its member agencies. Metropolitan currently provides between 45 and 60 percent of the municipal, industrial, and agricultural water used in its service area. Metropolitan projects that by 2020, it will provide an average of 31 percent of the total water demand within its service area. The remaining 69 percent comes from conservation (17%), 20x2020 conservation (7%), and local supplies including groundwater, surface water, and recycled water (45%).[25]

[25] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010

Metropolitan's primary goal is to provide reliable water supplies to meet the water needs of its service area at the lowest possible cost. Metropolitan continues to develop and encourage projects and programs to ensure 100 percent reliability now and into the future even though it faces increasing challenges with its supplies.[26]

Metropolitan Integrated Water Resources Plan (IRP) 2010 Update

Metropolitan's 1996 and 2004 IRP resource strategies emphasized the need for a diverse and adaptable water supply strategy to cope with changing circumstances and conditions. Recent history and events have highlighted several emergency trends that need to be addressed in the context of the region's water supply planning and reliability. These trends cover a wide range of considerations including climate change, energy use and greenhouse gas emissions, endangered species protection and conveyance needs in the Bay-Delta. These trends demonstrate the importance of updating Metropolitan's IRP and to the need to solidify adaptive strategies to address additional water supply challenges into the long-term future.[27]

Metropolitan's IRP 2004 Update stated that Metropolitan's regional production target for its Local Resources Program (LRP)[28] was 500,000 AF by 2020. Metropolitan's IRP 2010 Update now states that Metropolitan will honor its current LRP contracts to expiration. The local resources included are those developed or committed to date, as part of its Core Resources Strategy, and are shown to grow to estimated full yield through 2035. The LRP full yield amount is 300,000 AF instead of 500,000 AF, Metropolitan will be looking to member and local agencies for responsibility to develop new local resources and conservation, without any participation or financial incentives from MWD. This approach assumes supplies are augmented through implementation of a Delta fix by 2022, which improves the SWP yield to levels approximating those estimated prior to the court rulings and Biological Opinion to protect Delta smelt and Chinook salmon, without additional Metropolitan-initiated local resource augmentation or participation.

Metropolitan states that a key evolution in its IRP 2010 Update from the IRP 2004 Update is the identification of uncertainties and contingency actions that will extend the concept of a planning buffer into an operational approach to accomplish regional reliability goals. The options presented in Metropolitan's IRP 2010 Update are projected to meet future water supply needs of Southern California, and identify "low-regret" (minimal disappointment) actions that Metropolitan can take in order to swiftly respond to uncertainties that exist with all water resource programs.

Metropolitan's current projections of regional implementation of recycling, groundwater recovery, and seawater desalination exceed the 2004 IRP goals.

[26] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010
[27] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010
[28] In 1998, MWD established the competitive Local Resources Program (LRP), which encourages local development of recycled water and recovered groundwater through a process that emphasizes cost-efficiency to MWD, timing new production according to regional need, and minimizing administrative cost and complexity. The LRP provides a financial incentive per AF of product water from the proposed project.

In 2009, LRP recycled water and groundwater recovery programs produced 223,000 AF; 161,000 AF and 62,000 AF, respectively. Another 182,000 AF was produced by local agencies without Metropolitan funding assistance. Currently, the LRP has 84 projects planned and 80 in operation, with an ultimate yield of 421,000 AF. Since inception, the projects have produced 1,868,000 AF.[29]

Metropolitan has made investments in conservation, water recycling, storage, and supply that are all part of Metropolitan's long-term water management strategy. Metropolitan's approach to a long-term water management strategy was to develop an Integrated Resource Plan that is comprised of many sources of supply. Metropolitan's implementation approach for achieving the goals of the IRP is shown as a *Summary of Action Under Core Resources Strategy* in Table 3.2-14.

Table 3.2-14
Metropolitan IRP Summary of Action Under Core Resources Strategy

Core Resource	Development Area
CRA	• Continue existing programs and partnerships • Pursuit of further innovations in Colorado River-related storage, conservation, transfers, exchanges and agreements
SWP	• Delta ecosystem enhancement and species protection • Continue existing programs and pursuit of new sustainable storage and transfer agreements • Infrastructure improvements and flood control emergency preparation • Conveyance solutions • Continued collaboration with federal, state, and local stakeholders • Legislation supporting the goals above
Water Use Efficiency	• Support retail-level 20x2020 compliance, consisting of conservation and water recycling
Local Resource Augmentation	• Regionally pursue groundwater recovery, seawater desalination, and further recycling

Source: Metropolitan Water District of Southern California, *Integrated Water Resources Plan, 2010 Update, Report No. 1373,* October 2010, Table 4.1, p.4-2.

Metropolitan 2010 Regional Urban Water Management Plan (RAWMP)

The investments that Metropolitan has made and its on-going efforts in many different areas combine toward its goal of long-term regional water supply reliability. Many of the resource programs discussed in its 2010 RAWMP are already successfully implemented. Others, including institutional and facility changes in the Colorado River region and the SWP, will take more time to execute. Considerations are also in place for emerging integrated supplies, which could augment regional water supply from non-traditional

[29] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010

sources. In addition, water demand reductions brought about by legislative mandates could also affect the landscape of future supply planning and implementation.

Metropolitan is implementing water supply alternative strategies for the region to ensure available water in the future. In addition, an adaptive management approach will prepare the region to deal with unforeseen supply shortages. Some of the strategies identified, including four local water sources, in Metropolitan's 2010 RAWMP include:

- Stormwater
- Recycled Water
- Gray water
- Seawater
- Conservation
- Groundwater Recovery
- Storage and groundwater management programs within Southern California
- Storage programs related to the State Water Project and the Colorado River
- Other water supply management programs outside of the region

Table 3.2-15 summarizes total Metropolitan programs and water supply capabilities, presenting both current programs and the programs that are still under development.

Table 3.2-15
Metropolitan 2010 RAWMP Summary of Program Capabilities
(AFY)

Programs (#)	Average Year	Single-Dry Year	Multiple Dry Years
Colorado River Aqueduct			
Current Programs - 15	1,136,000	1,123,000	1,120,000
Programs Under Development – 6	182,000	182,000	182,000
Less CRA Capacity Constraint	(364,000)	(351,000)	(348,000)
Maximum MWD CRA Supply	954,000	954,000	954,000
State Water Project			
Current Programs - 5	1,441,000	375,000	615,000
Programs Under Development - 2	605,000	628,000	341,000
Maximum MWD SWP Supply	2,046,000	1,003,000	956,000
Central Valley/SWP Storage and Transfer Programs			
Current Programs - 6	292,000	234,000	196,000
Programs Under Development – 5	110,000	72,000	78,000
Maximum CV/SWP Programs	402,000	306,000	274,000
Local Resources Program			
Recycled Water	335,000	335,000	335,000
Groundwater Recovery	86,000	86,000	86,000
Ultimate LRP Yield	421,000	421,000	421,000
Seawater Desalination			
Current Projects – Pilot Studies	102,000-114,000	102,000-114,000	102,000-114,000
Conjunctive Groundwater			
Dry Year Yield Projects - 12	0	117,300	117,300

Western Municipal Water District

WMWD has several proposed local water projects that will provide additional potable supplies, thereby making imported water more reliable. The following are some of WMWD projects that would benefit RCWD:

Perris North Sub-basin. In 2008, EMWD and WMWD 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, which helping address rising groundwater levels at MARB. The study found that additional groundwater development potential exists both north and east of the base and is estimated at about 2,000 to 4,000 AFY. Four production wells with wellhead treatment for removal of volatile organics are expected to be required.

Arlington Desalter Expansion. Expansion of the Arlington Desalter is proposed from its current capacity of 5 MGD to 10 MGD. WMWD has performed feasibility studies and design needed for the expansion, which will result from improved treatment efficiency and new rate water wells. WMWD anticipates these improvements will result in additional product water from the Arlington Desalter – 9,800 AFY by 2015 and 3,800 AFY by 2020.

Chino Desalter Expansion. Upon completion of the Chino Desalter Expansion, anticipated in the fall of 2014, WMWD will receive 3,500 AFY. Expansion of the Chino I Desalter and Chino II Desalter is part of the Optimum Basin Management Program to extract up to 40,000 AFY of groundwater; currently about 28,000 AFY is being extracted and treated at the two desalter facilities.

Riverside Corona Feeder and Seven Oaks Dam, Groundwater Banking. WMWD will store excess water, when available, in the San Bernardino Basin Area (SBBA). The SBBA was defined and adjudicated by the Western Judgment in 1969. As of the 2009 Annual Western-San Bernardino Watermaster Report, WMWD has 5,888 AF of credit accumulated in the SBBA. The water would be extracted as needed, and transported to Western's customers and water purveyors, including RCWD, within Western's boundaries for use during dry years.

WMWD Water Recycling Facility Expansion. WMWD intends to expand the use of recycled water from 700 AFY in 2015 to 3,200 AFY in 2035. Again, this will assist to make imported water available where needed and more reliable.

Eastern Municipal Water District

EMWD's IRP serves as a framework for planning and prioritizing supply options. Several supply portfolios were developed and evaluated, which resulted in several

proposed projects and supply options evaluated during the IRP process. Portfolios that increased water use efficiency, and implemented local supply projects including desalination and recycled water projects, met many of the IRP objectives.

EMWD Recycled Water Strategic Plan evaluated special projects for expanded use of recycled water. In addition, EMWD is planning to expand the use of its existing recycled water system to meet convention demands for recycled water. In the past several years, EMWD has invested in facilities to increase the reliability and effectiveness of the recycled water system. Recycled water use is planned to increase from 42,847 AFY in 2010 to 55,300 AFY in 2035.[30]

EMWD has an existing desalination program that recovers high TDS groundwater from the Menifee and Perris South Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone for potable use. A third desalination plant, Perris II, has been designed and is projected to be on line in 2015. A fourth desalter could be warranted to meet salinity management requirements.

EMW is also planning to step up water use efficiency, since it's a cost effective method of improving reliability and extending the capacity of supply programs. EMWD is proposing a targeted 30 percent reduction in outdoor demand and a 10 percent reduction in indoor demand by 2035. This may be achieved by adjustments in the budget based tiered rate, additional legislation and code changes and through active conservation programs.

3.3 WATER QUALITY OF EXISTING SOURCES

Potable water supplies within the District's service area are derived from a combination of local groundwater and imported water from Metropolitan. Contamination of these sources or more stringent regulatory requirements has the potential to result in adjustments to water resource management strategies and, in a worst case scenario, impact supply reliability; water quality is intrinsically tied to supply reliability. The District currently blends its available supply sources to mitigate against water quality impacts. On average, residents and businesses in the District's service area receive water composed of 40 percent groundwater and 60 imported water.

Federal regulations require the U.S. Environmental Protection Agency (EPA) to safeguard drinking water by establishing standards that limit the amount of substances in drinking water. In California, Title 22 Drinking Water Standards (Title 22) incorporates the federal requirements of the Safe Drinking Water Act (SDWA), and compliance with Title 22 is required by all water service providers. Therefore, Title 22 Monitoring of all regulated chemicals as well as a number of unregulated chemicals is conducted by the District and Metropolitan. In order to be in compliance with Title 22, each agency must ensure that the regulated chemicals meet established primary drinking water standards to

[30] EMWD, 2010 UWMP, Table 2.5, p. 21, June 2011

ensure the safety of the water supply and protect the public health. In addition, secondary drinking water standards have been set for some minerals based on non-health related aesthetics such as taste, odor, clarity, and color.

In California, the CDPH also safeguards drinking water by establishing standards that are as stringent as the EPA's. These standards, also known as maximum contaminant levels (MCL), are established in two categories: 1) primary standards to protect the public health and 2) secondary standards to preserve water's aesthetic qualities such as taste, odor, clarity, and color.

Unregulated chemicals do not have established drinking water standards, but are chemicals of concern for which standards may eventually be adopted. These unregulated chemicals often have a "notification level", which is a health-based advisory level established by CDPH.

3.3.1 Source Water Quality Monitoring Practices

The District safeguards its water supply by exceeding the monitoring frequencies required by the EPA and CDPH. The District's water distribution system is also monitored at various locations to ensure good water quality throughout the system. RCWD drinking water is tested extensively and results consistently show that regulated contaminants are either not detected or are present in amounts far below the limited permitted by state and federal drinking water standards. In 2012, the District collected more than 2,000 samples for analysis for 120 different contaminants including bacteria, metals, organic chemicals, pesticides, and aesthetic-related substances.[31] As reported in the District's Annual Consumer Confidence Report for calendar year 2012, all water produced and delivered by the District meets or exceeds standards for public drinking water.

The District also monitors the drinking water and raw water used to recharge the groundwater basin from Metropolitan through monthly water quality data received from Metropolitan. In addition, the District monitors for TDS and Chlorides on a bi-weekly basis and posts the results on the RDWD website.[32]

3.3.2 Imported Water

Metropolitan Treated Water

To the extent possible, Metropolitan responds to water quality concerns by concentrating on protecting the quality of the source water and developing water management programs that maintain and enhance water quality. Contaminants that can be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending. In addition, Metropolitan has developed enhanced security practices and policies in response to national security concerns.

[31] Rancho California Water District Consumer Confidence Report, Monitoring Data & Test Results from Calendar Year 2012
[32] http://www.ranchowater.com/DocumentCenter/View/568

Metropolitan's two water supplies, the SWP and the Colorado River, each have specific quality issues. Metropolitan states they have not identified any water quality risks, to date, that cannot be mitigated. The only potential effect of water quality on the level of water supplies based on current knowledge could result in increases in the salinity of water resources. If diminished water quality caused a need for membrane treatment, Metropolitan could experience losses of up to 15 percent of the water processed. However, Metropolitan would only process a small portion of the affected water and would reduce total salinity by blending the processed water with the remaining unprocessed water. Thus, Metropolitan anticipates no significant reductions in water supply availability from these sources due to water quality concerns.[33]

Metropolitan's continues to make protection of its water system a top priority. In coordination with its 26 member public agencies, Metropolitan added new security measures in 2001 and continues to upgrade and refine procedures. Metropolitan tests and treats its water for microbial, organic, inorganic, and radioactive contaminants as well as pesticides and herbicides. Metropolitan conducts over 300,000 analytical water quality tests annually on 120 constituent samples collected within its service area, as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.

Metropolitan has one of the most advanced laboratories in the country where water quality professionals perform tests, collect data, review results, prepare reports, and research other treatment technologies. Although not required, Metropolitan monitors and samples elements that are not regulated but have attracted scientific and/or public interest. Metropolitan has tested for chemicals such as perchlorate, arsenic, methyl tertiary butyl ether (MTBE), and chromium VI among others.

Metropolitan identified water quality as a possible risk to its future water supply reliability. Existing supplies could be threatened in the future because of more stringent water quality regulations, and/or the discovery of a previously undetected contaminant. Impairment of the quality of imported water could directly impact the amount of water supplies available to the District.

Metropolitan recognizes the potentially significant water quality issues with its Colorado River and SWP water supply, as well as local agency supplies and groundwater storage. Contamination of groundwater and new standards may add costs to the use of groundwater storage and may affect the availability of local groundwater sources. This may affect the level of demand on Metropolitan supplies if local agencies abandon supplies in lieu of treatment options. Within Metropolitan's service area, local water sources account for approximately half of the salt loading, and imported water accounts for the remainder. All of these sources must be managed appropriately to sustain water quality and supply reliability goals.

[33] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010

Metropolitan's 2010 AWMP Update identifies the following issues of concern:

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

Total Dissolved Solids Management

High TDS levels in imported water delivered by Metropolitan to the region impacts District management of water resources and can adversely affect agriculture. High TDS levels in potable water leads to: increased recycled water treatment costs, increased water losses during the recycled water treatment processes, reductions in recycled water use as demand decreases for recycled water with high TDS levels, difficulties in complying with RWQCB standards, increases in brine volumes, and ultimately diminished ability to use the underlying groundwater basins for water storage.

Metropolitan's Salinity Management Policy

Metropolitan's Board of Directors has adopted a salinity objective of 500 mg/L for blended imported water delivered to its member agencies as defined in Metropolitan's Salinity Management Action Plan. This requires careful operational planning and management to achieve. Components of the action plan include: 1) imported water source control and salinity reductions; 2) distribution system salinity management actions; 3) collaborative actions with other agencies; and 4) local salinity management actions to protect groundwater and recycled water supplies.
Metropolitan estimates that the salinity objective can be met in seven out of ten years by blending Colorado River water with SWP water. In the other three years, hydrologic conditions would result in increased salinity and reduced volume of SWP supplies.

Colorado River Water Quality

Water imported via the CRA has the highest level of salinity of all Metropolitan's sources of supply, averaging around 630 mg/L during normal water years.[34] Several actions have been taken on the state and federal level to control the salinity in the river such as the

[34] Metropolitan Water District of Southern California, Regional UWMP, November 2010

Colorado River Basin Salinity Control Act in 1974 and formation of the Colorado River Basin Salinity Control Forum. In 1975, the EPA approved water quality standards and a long-term plan for controlling salinity. Funds are appropriated annually to help fund salinity mitigation and reduction projects throughout the watershed.

Salinity levels are dependent upon precipitation in the Colorado River Basin. During drought years salinity levels increase and during years with above normal precipitation salinity levels decline as naturally occurring salt concentrations decline. Salts in the Colorado River are mostly indigenous and pervasive, and easily eroded, dissolved and transported into the river system. The Colorado River Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system, targeting interception and control of non-point sources, such as surface runoff, wastewater, and saline hot springs. The program has proven successful; reducing salinity concentrates of Colorado River water on average by over 100 mg/L per year.

State Water Project Water Quality

SWP TDS levels are significantly lower than CRA water, averaging 250 mg/L for water delivered via the East Branch of the SWP and 325 mg/L for the West Branch deliveries. West Branch deliveries have higher TDS levels as a result of salt loading in local streams, operational conditions, and evaporation at Pyramid and Castaic Lakes. TDS levels and available supply vary based on hydrologic conditions in the Sacramento-San Joaquin watersheds, introduction of saline non-project waters by upstream parties, as well as saline intrusion in the Bay Delta. Variations of TDS levels over short periods of time are attributed to seasonal and tidal flow patterns presenting a unique challenge in trying to achieve Metropolitan's 500 mg/L TDS objective.
During periods when TDS levels are high at the SWP intake facilities and in the Colorado River it may not be possible to meet Metropolitan's salinity objective and maintain water supply reliability. Metropolitan's Board has adopted a statement of needs "to meet Metropolitan's 500 mg/L salinity-by-blending objective in a cost-effective manner while minimizing resource losses and ensuring the viability of recycling and groundwater management programs."

Further, a federal court ruling and a resulting Biological Opinion issued through consultation with the U.S. Fish and Wildlife Service (USFWS) addressing effects of the water supply pumping operations on Delta smelt has limited SWP exports at specific times of the year since December 2007. These restrictions have increased reliance on higher salinity Colorado River water, impacting the ability to meet the 500 mg/L salinity goal. Drought conditions leading to lower SWP water supply allocations in recent years also affects Metropolitan's ability to meet its salinity goal.

SWP Blending with Colorado River Water

To achieve salinity goals, Metropolitan blends SWP water supplies with Colorado River supplies. Using this approach, as stated previously, the salinity target could be met in seven out of ten years. In the other three years, hydrologic conditions would result in

increased salinity and reduced volume of SWP supplies. Metropolitan believes such conditions are inevitable and salinity could be a concern as such times. Local agencies receiving imported water have taken this concern into development of their management strategies for operation of local projects and groundwater to mitigate the effect of higher salinity levels in imported waters. Metropolitan is also concentrating on obtaining better quality water in spring/summer months to maximize the use of recycled water in agriculture.

Perchlorate in Colorado River

Perchlorate is a contaminant of concern and is known to have adverse effects on the thyroid. Perchlorate has been detected at low levels in the CRA water supply, but not in the SWP water supply since monitoring began in 1997, thus this discussion will focus on the CRA water supply. Perchlorate is difficult to remove from water supplies with conventional water treatment. Successful treatment technologies include nanofiltration, reverse osmosis, ion exchange, biological treatment, and fluidized bed bioreactor treatment. Metropolitan continues to monitor perchlorate contamination of the Colorado River as well as research various treatment options.

In 2002, Metropolitan adopted a Perchlorate Action Plan, which defines the following nine objectives that it continues to follow successfully:

- Expand monitoring and reporting programs
- Assess the impact of perchlorate on local groundwater supplies
- Track remediation efforts in the Las Vegas Wash
- Initiate modeling of perchlorate levels in the Colorado River
- Investigate the need for additional resource management strategies
- Pursue legislative and regulatory options
- Include information on perchlorate in outreach activities
- Provide periodic updates to the Metropolitan Board and member agencies

Through its Perchlorate Action Plan, Metropolitan has taken a proactive approach towards addressing a potential water quality issue and ensuring minimal or no water supply losses associated with perchlorate.

An exceedance level for perchlorate has not been adopted at this time by CDPH. However, CDPH has adopted a notification level of 6 µg/L, requiring agencies to inform their governing bodies. Notification of customers and the potential health risks is also recommended. CDPH recommends non-utilization of sources with perchlorate levels greater than 60 µg/L. Perchlorate primarily interferes with the production of hormones for normal growth and development in the thyroid gland. Further research on the health effects of Perchlorate is pending.

Metropolitan began monitoring for perchlorate in June 1997 after it was detected in the Colorado River and the Lake Mead outlet at Hoover Dam. Sampling was able to isolate the source to the Las Vegas Wash and its potential source in Henderson, Nevada. A

quarterly monitoring program for Lake Mead was initiated in August 1997 followed by monthly monitoring of the CRA. Following detection of perchlorate in the Colorado River, Metropolitan, along with the USEPA and agencies in Nevada including the Nevada Department of Environmental Protection, organized the successful treatment and reduction of perchlorate. Since inception the amount of perchlorate entering the Las Vegas Wash has been reduced from over 1,000 pounds per day in 1997 prior to treatment to 60-90 pounds per day since early 2007. This has resulted in over 90 percent reduction of perchlorate loading in the Colorado River system. Perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from its peak of 9 µg/L in May 1998 to less than 2 µg/L since June 2006.

Total Organic Carbon and Bromide

SWP water supplies also contain levels of total organic carbon and bromide that are a concern to Metropolitan to maintain safe drinking water supplies. Colorado River water does not have high levels of TOCs and bromide. When water is disinfected at treatment plants certain chemical reactions can occur with these impurities that can form Disinfection Byproducts (DBP). DBPs in turn can result in the formation of Trihalomethanes (THMs). Studies have shown a link between certain cancers and DBP exposure. While many DBPs have been identified and some are regulated under the SDWA, there are others that are not yet know.

In 1998, the USEPA adopted more stringent regulations for DBPs that took effect in 2002. This rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required system to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in January 2006 that makes regulatory compliance more challenging as compliance is based on a locational basis, rather than on a distribution system-wide basis.

Existing levels of TOC and bromide in the Bay-Delta water supplies present significant concern to Metropolitan's ability to maintain safe drinking water supplies and comply with regulations. Levels of these constituents in SWP water increase dramatically due to agricultural drainage and seawater intrusion as water moves through the Bay-Delta. One of Metropolitan's primary objective for the CALFED Bay-Delta process is protection and improvement of the water quality of its SWP supplies to ensure compliance with current and future drinking water regulations. Source water protection of SWP water supplies is necessary a component of meeting these requirements cost effectively.
CALFED's Bay Delta Program calls for a wide array of actions to improve Bay-Delta water quality, ranging from improvements in treatment technology to safeguarding water quality at the source. These actions include conveyance improvements, alternative sources of supply, changes in storage and operations, and advanced treatment by water supply agencies.

Source water quality improvements must be combined with cost-effective water treatment technologies to ensure safe drinking water at a reasonable cost. Metropolitan has five treatment plans: two that receive a blend of SWP water exclusively, and three

that receive a blend of Colorado River water. In 2003 and 2005, Metropolitan completed upgrades to its SWP-exclusive water treatment plants, Mills and Jensen, respectively, to utilize ozone as its primary disinfectant. This ozonation process avoids the production of certain regulated disinfection byproducts that would otherwise form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water have met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limits the percentage of water from the SWP used in each plant. In mid-2010, Metropolitan anticipated ozone at the Lake Skinner water treatment plant to come online. Metropolitan's Board has also adopted plans to install ozonation at its other two blend plants.

Nutrients

Elevated levels of nutrients (phosphorus and nitrogen compounds) can stimulate nuisance algal and aquatic weed growth that affects consumer acceptability, including production of noxious taste and odor compounds and algal toxins. In addition, increased in algal and aquatic weed biomass can impede flow in conveyances, shorten filter run times and increase solids production at drinking water treatment plans, and add to organic carbon loading. Further, nutrients can provide and increasing food source that may lead to the proliferation of quagga and zebra mussels, and other invasive biological species. Studies have shown phosphorus to be the limiting nutrient in both SWP and Colorado River supplies.

Metropolitan has a comprehensive program to monitor and manage algae in its source water reservoirs. This program was developed to provide an early warning of algae related problems and taste and odor events to best manage water quality in the system. Further, with population growth expected to continue in the future, ensuring high levels of treatment at wastewater treatment plants to maintain existing phosphorus levels will be critical in minimizing the operational, financial, and public health impacts associated with excessive algae growth and protect downstream drinking water uses. In addition, Metropolitan continues its involvement with entities along the lower Colorado River seeking to enhance wastewater management within river communities. With its comprehensive monitoring program, Metropolitan anticipates no impact on availability of water supplies.

Other Contaminants of Concern

Metropolitan has identified various other contaminants of concern to its water supply sources.

Arsenic

Arsenic is a naturally occurring element found in rocks, soil, water and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks,

dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes.

The MCL for arsenic in domestic water supplies was lowered to 10 µg/L (10 parts per billion) for groundwater and surface water supplies, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. MWD's water supplies have had low levels of this contaminant and would not require treatment changes or capital investment to comply with this new standard. However, some of MWD's water supplies from groundwater storage programs are at levels near the MCL.

Currently, the California Office of Environmental Health Hazard Assessment (OEHHA) has set a public health goal of 0.004 µg/L for arsenic. For Metropolitan source waters, levels in Colorado River water have ranged from not detected to 3.5 µg/L, while levels in SWP water have ranged from not detected to 4.0 µg/L.

Uranium

Uranium is high priority with Metropolitan as a 16-million-ton pile of uranium mine tailings is 750 feet from the Colorado River in Moab, Utah. Percolation of rainwater through the pile occurs causing contamination of local groundwater resources and flows of uranium into the river. During a large flood or other natural disaster there is the potential for large volumes of the contaminated material to flow into the river. Interim action measures instituted by the U.S. Department of Energy (DOE), the responsible party for remediating the site, include intercepting portions of the contaminated groundwater before it enters the River. Through 2009, over 2,700 pounds of uranium in contaminated groundwater have been removed. Permanent offsite removal by rail has shipped over 1 million tons of mill tailings to a disposal cell 30 miles northwest of the site through March 2010. An additional 2 million tons of mill tailings is expected to be moved by September 2011 and completion is anticipated by 2025, unless additional funding is secured, then completion would be accelerated to 2019.

Concentrations ranging from 950 to 1,190 picocuries per liter (pCi/L) have been detected at the point local groundwater enters the river. At Metropolitan's intake at the river, uranium concentrations of 1 to 6 pCi/L have been detected, well below California's MCL drinking water standard of 20 pCi/L. Metropolitan continues to monitor clean-up effort instituted by the DOE.[35]

Emerging Contaminants

N-Nitrosodimethylamine

N-Nitrosodimethylamine *(*NDMA) is an emerging contaminant of concern believed to be widespread. NDMA is a disinfection-product of water and wastewater treatment processes. Chlorine and monochloramines can react with organic nitrogen precursors to form NDMA. Both the USEPA and CDPH consider NDMA to be a probable human

[35] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010

carcinogen. The CDPH notification level is 0.010 µg/L. In December 2006, OEHHA set a PHG for NDMA of 0.003 µg/L. Concentrations found in Metropolitan supply range from non-detect (reporting limit of 0.002 µg/L) to 0.014 µg/L. Action measures may be required in the future to control or remove NDMA from water supplies.

Chromium VI

Hexavalent chromium or chromium VI is a potential surface water and groundwater contaminant. It is an inorganic chemical used in cooling towers for corrosion control, electroplating, leather tanning, wood treatment, and pigment manufacturing. Contaminant pathways include discharges from industrial users, leaching from hazardous waste sites, and erosion of naturally occurring deposits.

Currently there are no drinking water standards for Chromium VI. California has a current MCL for total chromium (includes chromium VI) of 0.05 mg/L (50 µg/L). This level is currently under review by CDPH. On August 20, 2009, OEHHA released a draft PHG of 0.06 µg/L for Chromium VI in drinking water. The PHG is a health-protective, non-regulatory level that will be used by CDPH in its development of an MCL. CDPH will set the MCL as close to the PHG as technically and economically feasible.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are a growing concern in the water industry. Numerous studies have reported the occurrence of these emerging contaminants in treated wastewater, surface water, and sometimes, in finished drinking water. The sources of PPCPs in the aquatic environment include treated wastewater and industrial discharge, agricultural runoff, and leaching of municipal landfills.

Currently, there is no evidence of human health risks from long-term exposure to the low concentrations of PPCPs found in some drinking water. There are not regulatory requirements for PPCPs; however, the USEPA included 13 PCPs on the Contaminant Candidate List 3 (CCL3).[36] But there are no standardized analytical methods for these compounds.

In 2007, Metropolitan implemented a monitoring program to determine the occurrence of PPCPs and other organic wastewater contaminants in Metropolitan's treatment plant effluents and selected source water locations within the Colorado River and SWP watershed. Analytical methods are still being refined and more work is required to fully understand occurrence issues. Metropolitan is actively involved in various studies related to PPCPs.

[36] CCL 3 is a list of contaminants, managed by the U.S. EPA, that are currently not subject to any proposed or promulgated national primary drinking water regulations, that are known or anticipated to occur in public water systems, and which may require regulation under the Safe Drinking Water Act (SDWA). The list includes, among others, pesticides, disinfection byproducts, chemicals used in commerce, waterborne pathogens, pharmaceuticals, and biological toxins.

Contaminants with Decreasing Concerns

Methyl Tertiary Butyl Ether (MTBE)

MTBE was the primary oxygenate in virtually all the gasoline used in California, prior to the discovery that MTBE had contaminated groundwater supplies and was found in surface water supplies. MTBE was banned in California in 2003 and has been subsequently replaced by ethanol.

CDPH adopted a primary MCL of 13 µg/L for MTBE based on carcinogenicity studies in animals. MTBE also has a California secondary MCL of 5 µg/L, which was established based on taste and odor concerns.

MTBE was discharged into surface water from the exhaust of recreational watercraft. At its Diamond Valley Lake and Lake Skinner, Metropolitan has taken numerous actions to reduce the potential for MTBE contamination. In 2003, Metropolitan's Board authorized a non-polluting boating program, including MTBE-free fuel and clean burning engines, and a monitoring program that will show if MTBE or other gasoline contaminants appear at the lakes.

MTBE and other oxygenates are regularly monitored in MWD's water supplies. In recent years, MTBE testing results in source waters have remained at non-detectable levels (below 3 µg/L).

MTBE still presents a significant problem to local groundwater basins from leaking underground storage tanks and poor fuel handling practices in the past at local gas stations. Treatment can be difficult, but improved underground storage tank requirements and monitoring, and the phase-out of MTBE as a fuel additive, will decrease the likelihood of MTBE groundwater problems in the future.

Metropolitan Water Quality Protection Programs

Metropolitan participates in multiple programs to address and improve water quality concerns and supplies. Some of the programs and activities include:

- Watershed Sanitary Survey;
- Source Water Protection and Assessment;
- Support of DWR policies and programs improving the quality of deliveries to Metropolitan;
- Support of the Sacramento River Watershed Program;
- Water quality exchange partnerships; and
- Implementation of additional security measures.

3.3.3 Murrieta-Temecula Groundwater

The District frequently monitors the water quality of its eight groundwater basins and 48 active wells. Every year the District conducts over 2,000 tests for water quality on each of its wells and throughout the distribution system.

Constituents of concern include TDS, nitrate, VOCs, perchlorate, fluoride and manganese. Groundwater in most of the Pauba aquifer and the Temecula aquifer is generally suitable for domestic and irrigation uses. TDS concentrations in the lower, confined and semi-confined Temecula aquifer tend to be lower than in the Pauba aquifer, though the percent sodium is higher in the Temecula aquifer.

The District has detected Nitrates above 22 mg/L, but less than the MCL of 45 mg/L in one of its 48 active wells. Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age.

While the District's water meets the standards for arsenic, it does contain low levels of this constituent. However, high concentrations have been detected in two groundwater wells causing RCWD to remove them production. In 2009, two other wells showed levels exceeding the MCL but remained in operation under approved blending plans. Arsenic is non-detect in imported water and ranges from non-detect to 25 ug/L in groundwater. Blended, the lowest monthly average is 2.6 ug/L, well below the standard of 10 ug/L for Arsenic.

DHS has indicated that perchlorate in groundwater in California likely reflects its use in the aerospace industry as a solid rocket propellant (in the form of ammonium perchlorate). Perchlorate interferes with the thyroid gland's uptake of iodine to produce thyroid hormones. Normal body metabolism requires thyroid hormones, as do normal prenatal and postnatal development and growth. To protect the public from the adverse health effects of perchlorate and, in the absence of drinking water standards for the contaminant, DHS established an Action Level derived from available health risk assessments.[37] Based on a recent EPA draft toxicity assessment for perchlorate, which suggests that the risks from exposure to perchlorate in drinking water may be greater than previously thought, DHS lowered the Action Level from 18 µg/L to 4 µg/L in January 2002, and subsequently revised it (now known as the Notification Level) to 6 µg/L in March 2004.

Exceedances of Drinking Water Standards

Fluoride: Sampling at the District's wells in 2009 indicated that the detected levels for Fluoride ranged between 0.1 and 4.0 mg/L, while the primary MCL standard is 2 mg/L. Fluoride occurs in the groundwater basins as a result of natural erosion, and water samples exhibiting high concentrations of arsenic often show high concentrations of

[37] Notification levels are health-based advisory levels established by DHS for chemicals in drinking water that lack maximum contaminant levels (MCLs). The DHS changed "action level" to "notification level" in 2004.

fluoride. Well sampling ranges reflect the highest reading and lowest reading from all of the District's wells and do not reflect average readings for all the wells. After well water is extracted it is blended with other well water and imported Metropolitan water. The distribution system lowest monthly average level of fluoride was 0.7 mg/L, well below the MCL.[38]

Manganese: Well sampling has also indicated that the reported levels have ranged between non-detect and 450 ug/L for the secondary MCL of 50 ug/L for manganese. Secondary MCLs are set based upon aesthetics and odor and are not set based on health standards. Non-detect measurements occur when a sample has concentrations below the detectable range of measurement instruments. Manganese is present in the groundwater as a result of leaching from natural deposits. Sampling in the distribution system has indicated that blending reduces the manganese concentration to the non-detect level.

Total Dissolved Solids (TDS)

Total dissolved solids (TDS) sampling has occurred over many years in the Murrieta-Temecula Basin and trend analysis show a mix of increasing and decreasing trends in TDS levels depending on location of wells and aquifer. During 2008-09, samples were collected from 44 wells, of which 31 wells were analyzed for nitrates and TDS only. Sampling from two of these wells (Wells 101 and 109) show TDS concentrations exceeding 750 mg/L, the Basin Plan objective.[39]

3.3.4 Recycled Water

CPDH has established regulations and guidelines for the use of recycled water under the California Code of Regulations, Title 22. Recycled water meets the water quality standards of its intended use. However, one of the challenges with the use of recycled water is that it has a higher salinity and nutrient concentration that than RCWD potable water supply. Salt and nutrients that are applied through landscaping, agriculture and storage must be mitigated to ensure protection of the groundwater basin.

RCWD treats all of the wastewater collected at the SRWRF to tertiary standards. EMWD treats all of the wastewater collected at the TVRWRF to tertiary standards and sells approximately 60 percent of total treated wastewater to EMWD retail and wholesale customers, including RCWD. However, the type of tertiary level treatment provided by EMWD and RCWD does not reduce TDS or nutrients to levels consistent with water supply objectives, but rather are utilized to ensure the protection of public health through the use of recycled water, which presently is managed in a manner that minimizes its' effect on local groundwaters.

[38] RCWD, Consumer Confidence Report, Calendar Year 2009
[39] Santa Margarita River Watershed, Annual Watermaster Report, Water Year 2008-09, p. 89

3.3.5 Changes in the District's Water Supply Due to Water Quality

Imported water treated and delivered from Metropolitan is consistently of good quality, resulting in a reliable supply of imported water. Metropolitan has identified water quality issues that are of concern and has implemented water management strategies to minimize the impact on water supplies, as discussed earlier in Section 4.

The groundwater quality in the Murrieta-Temecula Basin is considered good, especially where recharge occurs. Early monitoring and implementation of programs are intended to help producers maintain the groundwater production ability in accordance with the Basin agreements. Recycled water meets or exceeds stringent water quality standards.

There are no known water quality concerns that will significantly impact water supply reliability. Therefore, there is no projected reduction in water supplies due to water quality constraints during the 25-year planning period.

If water quality does impact the District's water supply in the future, the District will continue to implement its Water Facilities Master Plan and Capital Improvement Program, which provide for system redundancy and enhanced reliability of supply. For example, if groundwater becomes unusable (without treatment) due to water quality concerns, more imported water will be utilized and/or treatment could be applied to the affect groundwater. If imported water becomes limited due to diminished water quality, then additional treatment could be applied and/or more groundwater may be used.

3.4 WATER QUALITY EFFECT ON WATER MANAGEMENT STRATEGIES AND SUPPLY RELIABILITY

The District works collaboratively with EMWD, WMWD, and the Santa Margarita Watershed Watermaster to achieve the highest quality of water, safeguard the groundwater supply, and to ensure reliability of water supplies. The identified water quality issues facing the District include nitrates, TDS, arsenic, fluoride, and quagga mussels. A variety of water management strategies are implemented or planned for implementation by the District as discussed below.

Imported Water Quality

Through its management strategies and in coordination with member agencies, Metropolitan is able to provide member agencies supply options that may help local agencies meet regulatory standards. Currently known and foreseeable water quality issues are incorporated into existing management strategies to maintain the reliability of Metropolitan's supplies for the next 25 years. However, unforeseeable water quality issues could potentially alter Metropolitan's imported water and potentially impact its supply reliability.

Water Quality Monitoring

To comply with MCLs, the District safeguards its water supply by exceeding the monitoring frequency required by the EPA and DHS. The District's distribution system is also monitored at various locations to ensure good quality water throughout the distribution system. In 2009, the District collected more than 2,000 samples for analysis and tested for more than 100 substances.

Diversified Water Resource Mix

The District is seeking to maximize the use of alternative supplies resulting in a diversified water resource mix. The RCWD Water Facilities Master Plan and other planning documents identify the maximum use of recycled water, where appropriate and available, to ensure a reliable water supply for its service area.

Additionally, groundwater will continue to be a focus of water management for the District to optimize and ensure reliability of this valuable and significant local resource. The following section provides water quality program activities of the Watermaster that seek to ensure a reliable supply of groundwater.

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SECTION 4
WATER BALANCE: USE AND RELIABILITY

4.1 INTRODUCTION

Affordable housing, relative to neighboring Los Angeles and Orange Counties, and a Mediterranean climate, has given reason for the cities of Murrieta and Temecula and the surrounding region in southwest Riverside County to be desirable places to live. As such, population within the District's service area has grown significantly. Even agriculture, which is mainly orchards, citrus, avocados, and vineyards has grown, unlike in many other areas in Southern California. This urban and agricultural growth has led to increases in water demands. In particular, summer peaking in demands has been an issue due to the region's semi-arid climate.

The Water Balance section describes the District's water system demands and quantifies the current water system demand by sectors and projects them over the planning horizon of the 2012 AWMP. These projections include water sales to other agencies, water requirements for the Santa Margarita River, system water losses, and water use target compliance.

4.2 PAST, CURRENT, AND PROJECTED WATER USE AMONG SECTORS

Table 4.2-1 quantifies the past and current number of water service customers by sector for the years 2005 and 2010, respectively, and projections of customers through 2035.

Table 4.2-1
Number of Water Service Connections by Sector
Current and Projected

	2010	2012 Est.	2015	2020	2025	2030	2035
Potable Connections							
Single Family Residential	25,143	25,774	26,721	28,298	29,875	31,453	32,938
Multi Family Residential	1,887	1,935	2,006	2,125	2,244	2,363	2,475
Commercial/Institutional/Industrial	3,089	3,166	3,281	3,475	3,668	3,862	4,044
Landscape Irrigation	2,904	3,092	3,374	3,844	4,314	4,784	5,010
Agriculture	10,691	10,765	10,876	11,060	11,245	11,429	11,969
Other[1]	1,557	1,593	1,648	1,738	1,829	1,920	2,010
Total Potable Connections	**45,271**	**46,325**	**47,906**	**50,540**	**53,175**	**55,811**	**58,446**
Recycled – Golf, Landscape, Irrigation	171	173	177	189	189	189	189
Total Recycled Connections	**171**	**173**	**177**	**189**	**189**	**189**	**189**
Total Connections	**45,442**	**46,498**	**48,083**	**50,729**	**53,364**	**56,000**	**58,635**

Source: RCWD Engineering Department; based on land use data.

[1] Construction and other temporary accounts

Table 4.2-2 quantifies the water use per classification (sector) for the District. The projected water use by sector presented in the row entitled "Total Water Demand" reflects the total water demand projections shown in Table 4.2-1, Section 4 Water Reliability Planning, which do not include unaccounted-for water losses. The total water use presented in Table 4.2-1 takes unaccounted-for water losses into consideration.

Table 4.2-2
Past, Current, and Projected Water Use by Sector [1]
(AF)

	2005	2010	2012 Est.	2015	2020	2025	2030	2035
Potable								
Single Family Residential	35,637	29,900	32,473	36,332	39,250	42,387	45,378	48,516
Multi Family Residential	2,247	1,885	2,047	2,291	2,475	2,673	2,861	3,059
Commercial, Institutional, Industrial	3,814	3,200	3,476	3,889	4,201	4,537	4,857	5,193
Landscape/Golf Courses	6,178	5,183	5,629	6,299	6,804	7,348	7,867	8,410
Agricultural	19,899	16,695	18,017	20,000	20,000	20,000	20,000	20,000
Other[2]	680	571	620	693	749	809	866	926
Potable Demand	**68,457**	**57,434**	**62,262**	**69,504**	**73,479**	**77,754**	**81,829**	**86,104**
Recycled & Non-Domestic Demand[3]	3,459	4,367	4,420	4,500	4,800	4,800	4,800	4,800
Sale of Water to Others[4]	160	676	758	881	881	881	881	881
Total Water Demand	**72,076**	**62,477**	**67,440**	**74,885**	**79,160**	**83,435**	**87,510**	**91,785**
Santa Margarita River Discharge[5]	2,077	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Unaccounted-For Water[6]	3,457	2,915	3,157	3,520	3,722	3,936	4,139	4,353
Total Water Use	**77,610**	**69,392**	**74,597**	**82,405**	**86,882**	**91,371**	**95,649**	**100,138**

[1] Total potable and recycled water demand projections were obtained from Section 4, Table 4.2-3. Future demands for estimated based on land use and build out projections from RCWD Engineering data. Non-consumptive demands based on information from RCWD Operations data. Future demands for Agriculture is expected to remain stable.

[2] Includes water to construction, miscellaneous, and other temporary water use.

[3] Recycled water for agriculture, landscape, golf courses, construction and residential.

[4] Water wheeling agreements with EMWD and WMWD, and also to the Pechanga Reservation, which are shown in Table 2.1-2; recycled water to Pechanga included in recycled demand total.

[5] Required Santa Margarita River flows.

[6] Equal to difference between total water production and total billed (sales) water. 2010 was approximately 5.0 percent for potable water and 1.0 percent for recycled water, plus 15.0 percent for recycled water for indirect potable reuse (Table ; projected unaccounted-for water is anticipated to remain constant through the planning period to 2035.

The difference between the water production and the total billed water is defined as unaccounted-for water, or the water losses within a system. Unaccounted-for water may be attributed to unmetered water use, leaking pipes, or other events causing water to be withdrawn from the system and not measured, such as hydrant flushing, street cleaning, new construction line draining and/or filling and draining and flushing, and fire fighting.

An average annual unaccounted-for water loss of 5.0 percent[40] for potable water and 1.0 percent for recycled water was utilized to estimate unaccounted-for future water losses.[41]

Urban water demands have steadily increased in the District's service area since 1978 due to extensive growth. Agricultural water use increased in the early years and has remained relatively constant since 1995.

4.3 AGRICULTURAL

The main crop types within RCWD's service area are perennial and include winegrapes, citrus, and avocados totaling more than 20,000 irrigated acres, or approximately 20 percent of the District's service area. Relative to other crops grown within the region and throughout the State, the volume of water required for growing these crops is not "exceptionally high." Table 4.3-1 shows the annual water requirement in inches and ETo for the main crops in the District's service area.

Table 4.3-1
Crop Water Requirements*
1997 (Typical Year)

Crop Type	Annual Water Requirement (inches)	Annual Water Requirement (ETo %)
Citrus	35.91	70%
Avocados	35.40	69%
Grapes w/ 40% cover crop	18.75	36%

*Data included in this table is summarized from Cal Poly San Luis Obispo's Irrigation Training and Research Center's Report 03-001: California Crop and Soil Evapotranspiration *For Water Balances and Irrigation Scheduling/Design*

Table 4.3-2 illustrates the calculated annual crop water requirement in standard water measurement units, acre-feet and HCF (billing unit) per acre of irrigated crop. More detail on the allocation calculation is included in Section 6.3 of this Plan.

Table 4.3-2
Annual Water Use Allocation by Crop

Crop	Rancho Division		Santa Rosa Division	
	Acre-feet per acre	HCF* per acre	Acre-feet per acre	HCF* per acre
Cool Season Turf	4.09	1782	4.07	1773
Peaches	3.95	1721	3.95	1721
Avocados	3.69	1607	3.70	1612

[40] RCWD Engineering Department
[41] American Water Works Association states 10 percent or less unaccounted-for water (losses) in a water system is acceptable.

Crop	Rancho Division		Santa Rosa Division	
	Acre-feet per acre	HCF* per acre	Acre-feet per acre	HCF* per acre
Grapefruit	3.39	1477	3.43	1494
Pasture	3.22	1403	3.19	1390
Cut Flowers/Nursery Crops	2.95	1285	3.01	1311
Wine Grapes	2.98	1298	2.97	1294

*HCF billing unit is "hundred cubic feet"

4.4 ENVIRONMENTAL

Water for beneficial use of environmental resources is planned at the regional level and supplied within the service areas of each water agency in the region. RCWD does not supply water directly for environmental resources. However, RCWD is required under the Cooperative Water Resource Management Agreement (CWRMA) with Camp Pendleton to release 4,000 acre-feet of year into the Santa Margarita River for use downstream by Camp Pendleton. This release provides additional benefits to the ecological health of the river and groundwater basin.

4.5 RECREATIONAL

Located within the District's service area in Temecula's wine country, Vail Lake is a large reservoir of 1,000 surface-area acres in western Riverside County. Vail Lake is located on Temecula Creek and within the Santa Margarita Watershed, bordered by the Cleveland National Forest, Agua Tivia Wilderness, and Bureau of Land Management lands. It was created in 1948 when the owners of Vail Ranch constructed the 132 foot high Vail Lake Dam, which has been owned and operated by the RCWD since 1978. The 11,000+ acre property surrounding Vail Lake is privately owned, and recreational access to the lake is privately controlled. The lake is considered California's #1 Large Mouth Bass lake and is a popular Southern California destination for fishing, boating, and camping.

Historically, RCWD was only able to store local runoff in Vail Lake; however, the lake has the capacity to store imported water or highly-treated recycled water. Vail Lake has a surface water storage permit in Vail Lake for up to 40,000 AFY from November 1 to April 30. During these months, RCWD releases available water from Vail Lake to the VDC spreading basins, about 1.5 miles downstream, for groundwater recharge. From May through October, existing State permits prohibit storage and require inflow to pass through Vail Lake to Temecula Creek. The amount of local runoff reaching the lake can vary widely depending on hydrological conditions. From 1962 to 2000, flows into Vail Lake ranged from 218 AFY to 29,570 AFY, with an average flow of 5,150 AFY.

With development of the District's Vail Lake Stabilization and Conjunctive Use Project, the District will take advantage of additional imported water during wet years for storage

and use during dry years. While the source of water for Vail Lake has been natural runoff, construction of a pipeline from an imported water turnout to the lake would allow for seasonal storage and conjunctive use storage. Water could be temporarily stored in Vail Lake for future delivery to agricultural users or piped to the Pauba Groundwater Basin for recharge. The additional water for Vail Lake would not impact the reliability of water service to the District's customers, including agriculture.

4.6 MUNICIPAL AND INDUSTRIAL

The District service area includes water service to a variety of municipal and industrial (M&I) customers totaling approximately 77 percent of the District's service area. M&I customers include single family residential; multifamily residential; commercial institutional and industrial; landscape and golf courses; construction and other temporary water use as shown in Section 4.2 above. The District currently serves approximately 48,600 AF of water per year to M&I customers through 35,700 connections. Approximately nine percent of this demand is currently satisfied by recycled water.

4.7 GROUNDWATER RECHARGE

The District currently uses approximately 13,000 acre-feet per year of untreated imported water from Metropolitan for groundwater recharge. Recharge is accomplished through percolation in the VDC Spreading Basins.

To help achieve its mission, the District developed a Regional Integrated Resources Plan (IRP) in 2005. The purpose of the IRP is to provide a long-range water supply plan to reliably meet the needs of the District from now until 2050. The IRP examined different alternatives such as increased water conservation, additional groundwater, conversion of agriculture currently using treated imported water to raw imported water and/or advanced-treated recycled water, groundwater recharge using advanced-treated recycled water, and water transfers. These alternatives were evaluated and a preferred plan was developed. Included is a project to connect imported water connection EM-21 to Vail Lake to expand groundwater, called the Vail Lake Stabilization and Conjunctive Use Project.

The Conjunctive Use Project has been implemented and final construction is expected by early 2013. The Project will take advantage of additional imported water during wet years for storage and use during dry years. While the source of water for Vail Lake has been natural runoff, constriction of the pipeline from an imported water turnout to the lake allows for seasonal storage and conjunctive use storage. Once complete, water use in the District for groundwater recharge is anticipated to increase to 23,000 AF per year.

4.8 TRANSFER, EXCHANGES, AND WATER WHEELING AGREEMENTS

RCWD does not specifically have transfer and exchange agreements. However, RCWD does provide water services to properties within the EMWD and WMWD retail water

service areas under water wheeling agreements. Water is provided by EMWD to RCWD on an annual basis for the wheeling of water to the following EMWD's water customers: Nakayama Park, Lake Skinner Park, and Glen Oaks. Similarly, water is provided by WMWD to RCWD on an annual basis for wheeling water to WMWD's water customer, Rock Mountain.

Direct water service (i.e., outside RCWD service area) are arranged pursuant to interagency agreements. The interagency agreements provide for and address specific issues and terms related to wheeling of water through RCWD's water distribution system from an imported water supply connection to the point of delivery. Table 4.8-1 provides an overview of these agreements.

Table 4.8-1
RCWD Water Wheeling Agreements

Property Served	Service Capacity	Supply Connection	Interagency Agreement	Term	Status
Rancho Glen Oaks	Average 600 gpd/parcel for a maximum 115 metered (parcels) connections	EMWD adjustment of EM-13 allocation or other appropriate delivery point to compensate RCWD	Executed 1/20/93 between RCWD and EMWD	2023 (30 years)	Active
Lake Skinner Park	360 gpm	EM-13 and/or EM-20 will be identified in agreement update to reflect the supply connection to compensate RCWD	Executed 4/21/81 between RCWD and EMWD; update in 2011	2006 (25 years); currently renewing terms	Active; agreement update includes similar conditions of service, identify appropriate supply connection
Nakayama Park: Parcel No. 1 of PM 10037/APN 957-080-023	Undefined amount; inferred as amount used by property owner	Adjustment of EM-13 or EM-20 allocation to compensate RCWD	Executed 5/2/06 between RCWD and EMWD	2036 (30 years)	Active
Rock Mountain	500 gpm	WMWD adjustment of WR-26 or WR-28 allocation to compensate RCWD	Executed 1/19/05 between RCWD and WMWD	2035 (30 years)	Active
Pechanga Reservation	1,050 AFY (50% of safe yield of the Wolf Valley Groundwater Basin)	Produce groundwater from Pechanga wells or through potable connection to RCWD	Executed 12/21/06 Groundwater Management Agreement between RCWD and Pechanga Band of Luiseno Mission Indians	2031/2056 (25 years; auto-renew for 25 more years	Active
Pechanga Reservation	1,000 AFY	Metered connection for recycled from EMWD	Executed 2/28/08 between RCWD and EMWD	2028 (20 years)	Active

The historic and projected amount of wheeled water (sale of water to other agencies) is shown in Table 4.8-2. These amounts are used in the calculation of baseline and targets for compliance with a 20 percent reduction in urban water use by 2020.

Table 4.8-2
Historical and Projected Sale of Water to Other Agencies
(AFY)

	2005	2010	2015	2020	2025	2030	2035
Rancho Glen Oaks – EMWD	4	28	25	25	25	25	25
Lake Skinner Park – EMWD	156	59	200	200	200	200	200
Nakayama Park – EMWD	0	2	2	2	2	2	2
Rock Mountain – WMWD	0	4	4	4	4	4	4
Pechanga Reservation – Potable	0	266	250	250	250	250	250
Potable Subtotal Sale of Water to Other Agencies	**160**	**359**	**481**	**481**	**481**	**481**	**481**
Pechanga Reservation – Recycled	0	317	400	400	400	400	400
Total Sale of Water to Other Agencies	**160**	**676**	**881**	**881**	**881**	**881**	**881**

Source: RCWD Finance Department, Historical Data; RCWD Operations, Projections

4.9 DRAINAGE FROM RCWD SURFACE AREA

Surface drainage typically discharges to tributaries of the Santa Margarita River, including Murrieta and Temecula Creeks. These creeks confluence to form the Santa Margarita River. The River runs through habitat preserves operated by San Diego State University. The river system is highly ephemeral. Most drainages only flow during storm events. Sources of dry weather discharge include well blow offs, rising groundwater at the confluence of Murrieta and Temecula Creeks, excess irrigation runoff and water transfers. Given the size of the watershed, drainage can take multiple paths, including discharge to surface streams, to groundwater, and through preserves created by the Western Riverside County Multiple Species Habitat Conservation Plan.

The Riverside County Stormwater Program conducts dry and wet weather monitoring of several tributaries of the Santa Margarita River, including Murrieta and Temecula Creeks, Adobe Creek and Cole Creek. Monitoring includes over 200 chemical, toxicological and biological indicators. Sampling is typically conducted three times during wet weather and at least one during dry weather depending on the parameters. The program also monitors seven to eight rotating stations located in storm drain outfalls that may also collect agricultural drainage. To monitor the quality of groundwater, the RCWD conducts a comprehensive water quality monitoring program on its production wells.

Stormwater monitoring programs at Murrieta and Temecula Creeks indicate that pyrethroid pesticides may be causing toxicity to benthic organisms. Pyrethroids are typically used for ant control. Recent changes to regulations and labeling related to

pyrethroid pesticide use is expected to significantly reduce stream toxicity associated with pyrethroids. Chloropyrifus pesticides have also been identified as a potential contaminant in receiving waters. However, this listing is based on historic data and chloropyrifus has been largely banned, with only limited agricultural use still allowed. Data also indicates exceedances of nutrient, copper, iron and manganese water quality objectives. Iron and manganese are known to exist in high concentrations in local soils. As a result, rising groundwater typically exceeds the surface water quality standards. Nutrients are likely sourced from natural, urban and agricultural land uses. Copper has been most strongly leaked to brake pad dust from automobile operation.

The District is currently preparing a Salt and Nutrient Management Plan (SNMP) that will provide useful information to further characterize drainage water within the region. The SNMP will be complete in March 2014 and will be utilized for the 2015 Agricultural Water Management Plan Update.

4.10 WATER ACCOUNTING: SUPPLY AND DEMAND (USES)

4.10.1 Water Supply

Historically, groundwater has supplied between 25 to 40 percent of the District's total water supply and imported water has supplied between 60 to 70 percent. Recycled water has provided less than 5 percent; however, current and planned improvements will increase the use of recycled water. Consistent with Section 3, Water Supplies and Sources, Table 4.10-1 summarizes the District's current and projected water supplies under normal conditions.

Table 4.10-1
RCWD Current and Projected Water Supplies
(AF)

Water Supply Sources	2010	2012 Est.	2015	2020	2025	2030	2035
Imported Water (MWD)							
Treated	29,864	36,702	46,960	51,134	55,623	59,901	64,390
Untreated [1]	12,187	12,512	13,000	23,000	23,000	23,000	23,000
Untreated [2]	3,939	3,963	4,000	4,000	4,000	4,000	4,000
Local Groundwater Pumping	24,556	25,334	26,500	26,500	26,500	26,500	26,500
Recycled Water [3]	8,764	8,876	9,044	9,604	9,604	9,604	9,604
Vail Lake Release[4]	2,724	2,834	3,000	3,000	3,000	3,000	3,000
Total Supplies	**82,034**	**90,222**	**102,504**	**117,238**	**121,727**	**126,005**	**130,494**

Source: 2010 RCWD Urban Water Management Plan

Note: Imported and Recycled water amounts shown include unaccounted-for water.

[1] Used for groundwater recharge.
[2] Used for flows to the Santa Margarita River under settlement agreement with Camp Pendleton.
[3] Includes total capacity for the SRWRF (3,160 AFY in 2010, 3,440 AFY in 2015 and 4,000 AFY in 2020 and beyond) and total under agreement with EMWD from the TVRWRF (5,604 AFY or 5 MGD).
[4] Vail Lake releases to the Valle de los Caballos spreading basins for groundwater recharge.

4.10.2 Water Demand Projections

Projecting water demands allows RCWD to determine future water supply investments needed to match expected demands. Water demand projections are used to schedule these investments to ensure they are online when needed thus minimizing cost impacts of idle facilities.

The District's Water Facilities Master Plan and the District's IRP were both developed in 2005. Since that time, factors influencing water use projections, including economic and climate, have created the need to update this plan. As a result, projected water demands included herein were developed using a combination of information from RCWD Engineering, Operations, and Finance Departments.

The RCWD Engineering Department calculated water use projections based on land use, forecasting build out by parcel type. The Finance Department utilized historic water sales to project future water sales, and the Operations Department provided strategic information on water availability and demand forecasts from each water source, including water for groundwater recharge, water required to meet the Santa Margarita River discharge requirements as agreed to in the water rights settlement, and unaccounted-for water. Combining these data, the water demand projections through 2035 in the District service area were developed.

Consumptive water use includes billing classifications that are referred to comparably in the District's Facilities Master Plan. Table 4.10-2 shows the comparison of billing data classifications and land use categories used in combining data.

Table 4.10-2
Billing Data Classifications, Land Use Categories and 2010 AWMP Classifications

2010 Billing Data Classifications	RCWD Facilities Master Plan Classifications	2010 AWMP Classifications
Agricultural Ag/Domestic	Ag/Vineyard Planning Area Estate 20 Estate 10 Estate 5 Estate 2	Agriculture[1]
Domestic	Very Low Density Low Density Medium Density Medium High Density High Density	Single Family Residential
Multiple Dwelling	Multi-Family	Multi-Family Residential
Commercial Schools Misc Gov Other	Commercial Business Park / Industrial	Commercial, Institutional, Industrial
Golf Landscape Reclaimed Water	Open Space – Recreational	Landscape Irrigation Recycled Water: Golf Courses, Landscape Irrigation, Agriculture

[1] Ag/Domestic is included in single family residential

The District's projected water demands consider existing demand in the service area, land use development beyond 2010, and quantity of recycled water use and agricultural water use. Table 4.10-3 shows the total water uses in the RCWD service area by customer classification and additional water uses.

Table 4.10-3
Total Water Uses in RCWD Service Area - Current and Projected
Normal Water Year (AFY)

	2010	2012 Est.	2015	2020	2025	2030	2035
Single Family Residential	29,900	32,473	36,332	39,250	42,387	45,378	48,516
Multi Family Residential	1,885	2,047	2,291	2,475	2,673	2,861	3,059
Commercial/Institutional/ Industrial	3,200	3,476	3,889	4,201	4,537	4,857	5,193
Landscape Irrigation	5,183	5,629	6,299	6,804	7,348	7,867	8,410
Agriculture	16,695	18,017	20,000	20,000	20,000	20,000	20,000
Other[2]	571	620	693	749	809	866	926
Total Potable	**57,434**	**62,262**	**69,504**	**73,479**	**77,754**	**81,829**	**86,104**
Recycled – Golf Courses, Landscape Irrigation, Agriculture	4,367	4,420	4,500	4,800	4,800	4,800	4,800
Total Recycled	**4,367**	**4,420**	**4,500**	**4,800**	**4,800**	**4,800**	**4,800**
Sale of Water to Others - Potable	359	408	481	481	481	481	481
Sale of Water to Others – Recycled	317	350	400	400	400	400	400
Total RCWD Consumptive Demand	**62,477**	**67,440**	**74,885**	**79,160**	**83,435**	**87,510**	**91,785**
Groundwater Recharge with Imported Water	13,000	13,000	23,000	23,000	23,000	23,000	23,000
SMR Discharge[3]	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Vail Lake Releases	2,724	3,000	3,000	3,000	3,000	3,000	3,000
Unaccounted-for Water[4]	2,915	3,157	3,520	3,722	3,936	4,139	4,353
Total Water Use	**85,116**	**90,597**	**108,405**	**112,882**	**117,371**	**121,649**	**126,138**

4.11 WATER SUPPLY RELIABILITY

RCWD and all southern California communities and water agencies are facing increasing challenges and opportunities in their role as stewards of water resources in the region. Increased environmental regulations and competition for water from outside the region have resulted in reduced supplies of imported water. Continued regional population and economic growth increase water demand, putting an even larger burden on local supplies.

The reliability of the District's water supply is currently partially dependent on the reliability of its imported water supplies, which are managed and delivered by EMWD and WMWD, each a direct member agency of Metropolitan. RCWD also overlies the Murrieta-Temecula Groundwater Basin and is working in cooperation with the Santa Margarita River Watershed Watermaster and multiple stakeholders to achieve water supply reliability, water quality and watershed management goals for the Upper Santa Margarita Watershed and Southern California region.

The following sections describe the roles of various agencies in water supply reliability, and the near and long-term efforts they are involved with to ensure future reliability of water supplies to the District and the region as a whole.

4.11.1 Rancho California Water District

RCWD Regional Integrated Resources Plan (IRP)

To help achieve its mission, the District developed a Regional IRP in 2005. The purpose of the IRP is to provide a long-range water supply plan to reliably meet the needs of the District from now until 2050. The IRP examined different alternatives such as increased water conservation, additional groundwater, conversion of agriculture currently using treated imported water to raw imported water and/or advanced-treated recycled water, groundwater recharge using advanced-treated recycled water, and water transfers.

These alternatives were evaluated against a set of objectives, including the following:

- Reliably meet water demands
- Provide sustainable supply
- Maximize local control
- Manage costs
- Manage water quality
- Maintain quality of life
- Maximize implementation potential

Over a dozen alternatives were evaluated. The preferred plan, called Hybrid 1, involves the following components:

1. Implement baseline water conservation measures.

2. Connect imported water connection EM-21 to Vail Lake to expand groundwater recharge.
3. Convert eastern area agriculture, currently using treated imported water, to raw water, delivered from Vail Lake.
4. Construct up to 18 new groundwater wells, along with increased imported water for recharge during non-drought years.
5. Construct a microfiltration/reverse osmosis (MF/RO) treatment facility to reduce the salinity of recycled water so that it can be used to meet western area agricultural demands, as well as potential groundwater replenishment in the future.

The benefits of the preferred IRP alternative to do all of the following:

- Increase groundwater production of about 18,000 acre-feet per year;
- Increase use of recycled water of about 13,600 acre-feet per year;
- Reduce peaking on Metropolitan by about 144 cfs; and
- Achieve cost efficiency by: (1) converting eastern area agricultural users from treated imported water to untreated, (2) reducing the peaking charge paid to Metropolitan, and (3) by maximizing Metropolitan's discounted replenishment water rate for groundwater recharge.

RCWD Recommended Groundwater Production FY July 1, 2010 through June 30, 2011

The RCWD Recommended Groundwater Production report is an annual audit to recommend a groundwater production program for the upcoming fiscal year. The most current review was performed between October 2010 and December 2010 using current data from the water year ending September 20, 2010. The underlying philosophy guiding the audit is one of sound basin management. This management involves the operation of the groundwater basin within the safe yield limits so not to degrade water quality or violate legal restrictions.

The fiscal year groundwater production recommendations are based primarily on review of individual well production and historical hydrographs, as well as consideration of water level elevations from all production and monitoring wells. This information is used to formulate a recommendation for groundwater production for the next fiscal year. The recommendation also includes information gained from workshops held between RCWD, WMWD and consultant staff. Information includes discussion of previous audits, instantaneous yield, natural and artificial recharge, water quality, pump settings, well construction factors, and the projected production from WMWD wells in the Northern Murrieta Valley area.

Recommendations are consistent with RCWD's groundwater management plan and are verified using the calibrated surface and groundwater model of the Murrieta-Temecula Groundwater Basin.[42] The model simulates changes in water levels for a two-year period under recommended production conditions.

Upper Santa Margarita Planning Region Integrated Regional Water Management Plan (IRWMP)

The Upper Santa Margarita Planning Region IRWMP was adopted in 2007 to establish a collaborative effort in the watershed to ensure a sustainable water supply through more efficient use of water, protection and improvement of water quality and environmental stewardship. Through the IRWMP, regional water agencies, flood control districts, counties, cities, federal, state and local agencies and other stakeholders groups, are working across jurisdictional boundaries to implement water resource management projects with multiple benefits.

The following is the vision statement of the IRWMP: *"The Integrated Regional Water Management Plan will take a balanced and consensus-based approach that will provide for the protection and sustainability of the Upper Santa Margarita Watershed's water resources, natural resources, and habitats."*

Development of the IRWM required a cooperative effort on the part RCWD, Riverside County Flood Control and Water Conservation District (RCFC), and the County of Riverside, which have authority for planning and implementation of water management strategies in the watershed. In 2007, RCWD, RCFC and the County of Riverside signed a Memorandum of Understanding (MOU) by which the agencies cooperate and work collaboratively with other stakeholders in the watershed. The MOU provided for a Stakeholder Advisory Committee representing significant water and related organizations in the region to work collaboratively to improve water supply reliability, protect and improve water quality, ensure environmental sustainability, promote multiple benefits, and promote integration and regional planning. As a result, the IRWMP includes a list of priority ranked projects to meet the goals and objectives of the IRWMP. Both the IRWMP and the project listing are flexible and will be updated periodically.

RCWD Capital Improvement Program (CIP)

The RCWD prepares and adopts a CIP on an annual basis, and also considers a projected CIP for the next fiscal year. Projects include a range of capital project, including project that ensure system reliability to serve water to District customers.

Reliability elements in the Water Resource Division include, but are not limited to, such projects as potable water supply well rehabilitation, programmable logic controller

[42] Developed by GEOSCIENCE Support Services, Inc. using data from RCWD, USGS, U.S. Marin Corps Camp Pendleton Base, and Stetson Engineers, Inc. The USGS model MODFLOW was chosen since it is widely accepted as one of the industry standards for groundwater flow simulations.

replacement, variable frequency drive replacement, and motorized valves and electrical controls.

4.11.2 Regional Agencies and Water Reliability

Metropolitan Water District of Southern California (Metropolitan)

Metropolitan's primary goal is to provide reliable water supplies to meet the water needs of its service area at the lowest possible cost. The reliability of Metropolitan's water supply has been threatened as existing imported water supplies from the Colorado River and SWP face increasing challenges.

Metropolitan evaluated the dependability of these supplies and concluded that the combination of imported water and expanding local resource programs would ensure its service area's demands would be met in the future. EMWD and WMWD and their member agencies, including RCWD, expressly rely upon Metropolitan's 2010 AWMP in estimating future imported water availability to its service area.

In April 1998, Metropolitan adopted the WSDM Plan. The guiding principal of the WSDM Plan is to manage Metropolitan's water resources and programs to maximize utilization of wet year supplies and minimize adverse impacts of water shortages to retail customers. From this guiding principle come the following supporting principles:

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

In February 2008, Metropolitan adopted the Water Supply Allocation Plan (WSAP). The WSAP was developed in consideration of the principles and guidelines described in the WSDM Plan, with the objective of creating an equitable needs-based water supply allocation. 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 Metropolitan supplies of up to 50 percent.

Despite these challenges, Metropolitan continues to develop and encourage projects and programs to ensure reliability now and into the future. One such project is Metropolitan's recently completed Diamond Valley Lake in Hemet, California; an 800,000 AF capacity reservoir for regional seasonal and emergency storage for SWP and Colorado River water. The reservoir began storing water in November 1999 and reached the sustained water level by early 2002.

State Water Project (SWP)

The reliability of the SWP impacts Metropolitan's member agencies' abilities to plan for future growth and supply. In January 2010, the DWR Bay-Delta Office published a report

specifically addressing the reliability of the SWP.[43] This report, *The State Water Project Delivery Reliability Report* (DWR, 2009), provides information on the reliability of the SWP to deliver water to its contractors assuming historical precipitation patterns. The report updates the DWR's estimate of current (2009) and future (2029) SWP water delivery reliability. As in previous reliability reports, SWP deliveries are based upon operation simulations in DWR's CalSim II model. The 2009 report shows that future SWP deliveries will be impacted by two significant factors: 1) a significant restriction on the SWP and Central Valley Project (CVP) Delta pumping, as required by the biological opinions issued by the U.S. Fish and Wildlife Service (December 2008) and the National Marine Fisheries Service (June 2009); and 2) climate change, which is altering hydrologic conditions in the state.

The report represents the state of affairs if no Delta improvements are made. It shows the continued erosion of SWP water delivery reliability under the current method of moving water through the Delta. In the *2007 SWP Delivery Reliability Report*, the average Table A delivery was about 63 percent for 2007 conditions and about 66 to 69 percent for 2027 conditions.[44] In the 2009 report, the average Table A delivery is about 60 percent for 2009 conditions and about 60 percent for 2029 conditions. Most of the reduced reliability is caused by the export limitations resulting from the two Biological Opinions—the first factor identified above.

The significance of the most recent projected delivery reliability is that there is a relative decrease in SWP deliveries during wetter (higher allocation) years and a slight increase in deliveries during dry years. Metropolitan will have less SWP water available in wet years to refill its storage assets and for groundwater replenishment and slightly more water in dry years to meet its firm demand. In response to the *2007 State Water Project Delivery Reliability Report*, Metropolitan reduced its forecast of replenishment service water from seven out of ten years to three out of ten years. With the further erosion of SWP reliability projected in the *2009 SWP Delivery Reliability Report*, the availability of replenishment water service from MWD is seemingly more limited in the current 20-year planning period than was thought just two years ago.

On an annual basis, each of the 29 SWP contractors including Metropolitan request an amount of SWP water based on their anticipated yearly demand. In most cases, Metropolitan's requested supply is equivalent to its full Table A Amount.[38] After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, the SWP annual delivery of water to contractors has ranged from 552,600 AFY in 1991 to 3.5 MAF in 2000. Due to the uncertainty in water supply,

[43] Department of Water Resources, State Water Project Delivery Reliability Report. 2009, August 2010.

[44] Two types of deliveries are assumed for the SWP contractors: Table A and Article 21. Table A Amount, in AF, is the contractual, first priority amount of allocated SWP supply; it is scheduled and uninterruptible. Article 21 allows SWP contractors to receive additional water deliveries only under specific conditions. [Department of Water Resources, State Water Project Delivery Reliability Report, 2009.]

contractors are not typically guaranteed their full Table A Amount, but instead a percentage of that amount based on the available supply.

On January 20, 2011, SWP supplies were projected to meet 60 percent of most SWP contractor's Table A Amounts. A Notice to State Water Project Contractors was sent out indicating that this allocation is consistent with the long-term supply contracts and public policy. DWR's January 2011 projection included several factors including existing storage in SWP conservation reservoirs, SWP operational constraints such as conditions pertaining to the recent Biological Opinions for the Delta smelt and salmonids, the longfin smelt incidental take permit, and 2011 contractor demands. At that time, DWR indicated it may revise allocations in 2011 if warranted by emerging hydrologic and water supply conditions. DWR did just that, first on March 16, 2011, increasing the SWP allocation to 70 percent of contractors' requests, then again on April 20, 2011, increasing the SWP water allocation to 80 percent of contractors' requests. DWR's first estimate for 2011 was that it would be able to deliver 25 percent of requests.

On May 2, 2011, DWR released information from snowpack readings stating that snowpack water content was still 144 percent of the April 1 full season average. Melting snow supplies approximately one-third of the water used by Californians. As a result, DWR estimates it will be able to deliver 80 percent of requested SWP water in 2011. In 2010, the SWP delivered 50 percent of a requested 4,172,126 AF, up from a record-low initial projection of 5 percent due to lingering effects of the 2007,-2009 drought. Deliveries were 60 percent of requests in 2007, 35 percent in 2008, and 40 percent in 2009. The last 100 percent allocation – difficult to achieve even in wet years due to pumping restrictions to protect threatened and endangered fish – was in 2006.[45]

The Monterey Agreement, an accord intended to address SWP allocations during drought conditions, states that SWP contractors will be allocated part of the total available project supply in proportion to their Table A Amount. Water is allocated to urban and agricultural purposes on a proportional basis, eliminating a previous initial supply reduction to agricultural contractors. The Agreement further defines and permits permanent sales of SWP Table A amounts and provides for transfer of up to 130,000 AF of annual Table A amounts from agricultural use to municipal use. The Agreement also allows SWP contractors to store water in another agency's reservoir or groundwater basin, resulting in flexibility for SWP contractors to use their share of storage in SWP reservoirs; facilitates the implementation of water transfers; and provides a mechanism for using SWP facilities to transport non-project water for SWP water contractors.

Colorado River Aqueduct (CRA)

Metropolitan also depends on Colorado River water to meet its service area demands. A brief discussion of California's reliance on and reliability of the CRA follows.

[45] DWR Announces Results of Final Snow Survey of 2010-2011 Season, DWR News Release, May 2, 1011

The CRA is owned and operated by Metropolitan to transport water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County. Metropolitan acquires Colorado River water from the U.S. Bureau of Reclamation (USBR) and is limited to the capacity of the CRA, which is approximately 1.25 MAF/yr.[46]

Pursuant to the 1964 U.S. Supreme Court decree, Metropolitan's dependable supply of Colorado River water was limited to 550,000 acre-feet per year assuming no surplus or unused Arizona and Nevada entitlement was available and California agricultural agencies used all of their contractual entitlement. Historically, Metropolitan has also possessed a priority for an additional 662,000 AFY depending upon availability of surplus water. In addition, Metropolitan maintains agreements for storage, exchanges and transfers within the service area of Imperial Irrigation District (IID) that provide water to Metropolitan.[47]

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

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

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

In October 2003, the Quantification Settlement Agreement (QSA), a critical component of California's Colorado River Water Use Plan and the Interim Surplus Guidelines, was authorized defining Colorado River water deliveries, commitments, and transfers. The QSA is a landmark agreement, signed by the four California agencies that use Colorado River water and the U.S. Secretary of the Interior. The amount of Colorado River water available to Metropolitan's service area was augmented with the long-term transfer agreement between the IID and the San Diego County Water Authority (SDCWA). The transfer agreement provides up to 200,000 acre-ft of water per year from IID to SDCWA for a seventy-five year term. The transfer agreement is dependent upon QSA, which was invalidated on January 14, 2010 when a Sacramento Superior Judge issued a final ruling.

[46] Metropolitan Water District of Southern California, 2010 UWMP, p. 1-19, November 2010.
[47] Metropolitan Water District of Southern California, Integrated Water Resources Plan, 2010 Update, November 2010.

If the ruling survives an appeal, the IID-SDCWA transfer agreement may have to be revised and renegotiated. If it remains intact, the QSA will guide reasonable and fair use of the Colorado River by California through the year 2037 with a 45 year renewal for a total of 75 years.

Integrated Water Resources Plan (IRP)

To address Metropolitan's reliability challenges, Metropolitan and its member agencies developed an IRP in 1996. The overall objective of the Metropolitan IRP process is the selection and implementation of a Preferred Resource Mix (or strategy) consisting of complementary investments in local water resources, imported supplies and demand-side management that meet the region's desired reliability goal in a cost-effective and environmentally sound manner. The Metropolitan IRP 2003 Update was approved and released in July 2004, and includes various projects and programs that contribute to the reliability of Metropolitan's imported water supplies. The Metropolitan IRP Update concluded that the resource targets from the 1996 IRP, factored in with changed conditions, will continue to provide for 100 percent reliability through 2025.

Recent history and events have highlighted several emergency trends that need to be addressed in the context of the region's water supply planning and reliability. These trends cover a wide range of considerations including climate change, energy use and greenhouse gas emissions, endangered species protection and conveyance needs in the Bay-Delta. These trends demonstrate the importance of updating Metropolitan's IRP and to the need to solidify adaptive strategies to address additional water supply challenges into the long-term future.[48] As a result, Metropolitan updated its IRP in 2010.

Metropolitan's 2010 IRP Update states that a key evolution from the July 2004 IRP Update is the identification of uncertainties and contingency actions that Metropolitan can take in order to swiftly respond to uncertainties that exist with all water resource programs that will extend planning actions into an operational approach. The Metropolitan IRP is intended as a regional water resource planning document that identifies potential supplies to meet future demands, including contingencies for supply and demand uncertainties. However, Metropolitan recognized that reliable and comprehensive water planning goes beyond resource development. Metropolitan has pursued and developed programs to address emergency response for the Bay-Delta, storage, regional disasters, energy management, long-term financial implications, and coordination with local agencies' own planning efforts. The Metropolitan IRP sets out a general policy framework only and does not constitute approval of any specific actions by Metropolitan. The Metropolitan IRP process provides flexible planning direction, subject to annual adjustments and periodic updates. Specific initiatives or individually-listed projects are representative only and subject to full environmental study and board deliberation and reconsideration prior to any future approval. The Metropolitan IRP assists in a technological and programmatic means to accomplish regional reliability

[48] Metropolitan Water District of Southern California. Integrated Water Resources Plan. 2010 Update.

goals. The options presented in Metropolitan's IRP 2010 Update are projected to meet future water supply needs of Southern California.

As stated in Section 3, in 2009, LRP recycled water and groundwater recovery programs produced a total of 223,000 AF; 161,000 AF and 62,000 AF, respectively. Another 182,000 AF was produced by local agencies without Metropolitan funding assistance. Currently, the LRP has 84 projects planned and 80 in operation, with an ultimate yield of 421,000 AF. Since inception, the projects have produced 1,868,000 AF.[49] Metropolitan's current projections of regional implementation of recycling, groundwater recovery, and seawater desalination exceed the 2004 IRP goals, demonstrating regional water reliability.

In addition to the LRP, Metropolitan also provides financial and technical assistance for implementing water conservation Best Management Practices, as well as a significant investment in regional and local water conservation programs, and distribution of funding for conjunctive management programs in Southern California. Metropolitan has made investments in conservation, water recycling, storage, and supply that are all part of Metropolitan's long-term water management strategy that is adaptive to current reliability challenges.

Western Municipal Water District and Eastern Municipal Water District

As a water wholesaler, Metropolitan supplies supplemental imported water to WMWD and EMWD to meet the water needs of their service areas. Metropolitan's diverse resources and aggressive conservation program protect the reliability of the region's water supply, as discussed above. Metropolitan demonstrates that sufficient supplies can be reasonably relied on to meet projected supplemental demands. As a result, during a single dry year or multiple dry years, Metropolitan will have the resources to supply its member agencies with 100 percent of their imported water demands, as presented in Section 4.2, Demand and Supply Comparison.

Santa Margarita River Watershed Watermaster

As discussed in Section 3, the Watermaster works cooperatively with a steering committee comprised of entities within the watershed and overlying the groundwater basin. This collaborative approach contributes to and supports the management of reliable water supplies in the watershed.

The Watermaster prepares the "Santa Margarita Watershed Annual Watermaster Report", which provides annual reporting of water conditions in the watershed, but does not manage the groundwater basins. Water users in Santa Margarita River watershed are required to report the amount of surface water and groundwater they use to the Watermaster, but groundwater extraction is not restricted. The Annual Watermaster Report, prepared pursuant to the U.S. District Court Order, March 13, 1989, includes

[49] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010

information on surface and subsurface water, imports and exports, water rights, water production and use, threats to water supply, water quality, review of agreements, and Watermaster five-year projection of activities.
The District works cooperatively with the Watermaster to manage the basin on a watershed-wide basis through the Court jurisdiction, using the Annual Watermaster Report, groundwater management agreement, and cooperative water resource agreement, and the annual groundwater hydrogeologic assessment, "*Recommended Ground Water Production",* that continuously guides the management of the Murrieta-Temecula Basin on a sustainable safe yield basis.

California Regional Water Quality Control Board – San Diego Region (9)

Background

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (Regional Boards) are responsible for the protection and, where possible, the enhancement of the quality of California's waters. The SWRCB sets statewide policy, and together with Regional Boards, implements state and federal laws and regulations. Each of the nine Regional Boards adopts a Water Quality Control Plan or Basin Plan, which recognizes and reflects regional differences in existing water quality, the beneficial uses of the region's ground and surface waters, and local water quality conditions and problems.[50]

In 1975, the San Diego Regional Water Quality Control Board (RWQCB) published the original *Comprehensive Water Quality Control Plan for the San Diego Basin* (Basin Plan). In 1994, the RWQCB updated and adopted the Basin Plan to address issues that had evolved over time due to increasing populations and changing water demands in the region, which supersedes the 1975 Basin plan and its amendments.

The scope of the document covers the San Diego Basin, which includes the southwest corner of California and occupies approximately 3,900 square miles. The San Diego Region encompasses most of San Diego County, parts of southwestern Riverside County and southwestern Orange County. The Region is divided into 11 hydrologic areas and 147 hydrologic subareas. RCWD is located in the Santa Margarita Hydrologic Unit. Included in this area of about 750 square miles are portions of Camp Pendleton as well as Murrieta, Temecula and part of Fallbrook. The unit is drained largely by the Santa Margarita River, Murrieta Creek and Temecula River. The major surface water storage areas are Vail Lake and O'Neill Lake.

The Basin Plan is more than just a collection of water quality goals and policies, descriptions of conditions, and discussions of solutions. It is also the basis for the RWQCB's regulatory programs. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The RWQCB also regulates water

[50] Water Quality Control Plan for the San Diego Basin (9), September 8, 1994 (with amendments effective prior to April 25, 2007)

discharges to minimize and control their effects on the quality of the region's ground and surface water. Permits are issued under a number of programs and authorities.

Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. Legal basis and authority for the RWQCB reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code (Porter-Cologne Water Quality Control Act) and the Clean Water Act.[51]

Periodic review of the Basin Plan is required by state and federal law. California Water Code section 13240 states Basin Plans "shall be periodically reviewed and may be revised." Because federal law requires that water quality standards be reviewed every three years, the periodic review of the Basin Plan is commonly referred to as the "triennial review." The triennial review is not itself a Basin Plan amendment and does not itself result in changes to the Basin Plan. It is the process by which the San Diego RWQCB identifies and prioritizes Basin Plan issues in need of further review.

For the 2010 Triennial Review, the San Diego RWQCB is embarking on a new, stakeholder-involved process that includes the formation of a Triennial Review Advisory Committee. The purpose of this committee is to enhance public participation by the regulated community and other stakeholders, and to provide an opportunity for representatives to participate in the prioritization process. The process will seek a consensus-based draft list of priority issues for public review and, ultimately, adoption by the Board.

A public workshop was held on May 6, 2011 to present a proposed short list of suggested revisions of water quality standards and a public hearing was held June 8, 2011 to hear public comment pertaining to the Basin Plan review. After the hearing, Board members considered adoption of a resolution approving the Basin Plan review and adopting a short list of suggested revisions to work on over the subsequent three years.

Watershed Management Initiative

The Watershed Management Initiative, included in the 1995 Strategic Plan of the SWRCB and RWQCBs, addresses issues related to watershed management, describes current regional efforts, and established an action plan to implement watershed management plans statewide.

The San Diego RWQCB is fully committed to implementing the Watershed Management Initiative in the San Diego Region. Watershed management represents a departure from the traditional approach of protecting the quality and beneficial uses of ground and surface waters. The Watershed Management approach provides a framework to integrate

[51] Water Quality Control Plan for the San Diego Basin (9), September 8, 1994 (with amendments effective prior to April 25, 2007)

RWQCB programs and activities and allocating resources so as to more effectively and efficiently address water quality and beneficial use issues. Many water quality and beneficial use problems are best solved by considering entire watersheds, or portions of watersheds, rather than considering only individual waters, discharges, discharge types, or political jurisdictions. Involvement of all stakeholders, governmental and non-governmental agencies must be actively sought to identify the highest priority issues and achieve mutually beneficial solutions.

4.12 DEMAND AND SUPPLIES COMPARISON – WATER RELIABILITY ANALYSIS FOR NORMAL, SINGLE DRY AND MULTIPLE-DRY WATER YEARS

The available supplies and water demands for the District's water service area were analyzed to assess the District's ability to satisfy demands during three hydrologic scenarios: a normal water year, single dry water year, and multiple-dry water years. The tables in this section present the supply-demand balance for each of the hydrologic scenarios for the 25-year planning period 2010 to 2035. It is expected that the District will be able to meet 100 percent of its dry year demand under every scenario.

Metropolitan Supplies and Demands

As previously noted, the District is a member agency of EMWD and WMWD, which are member agencies of Metropolitan. Although only a portion of the District's total water supply is imported by Metropolitan, that portion does have an impact on the District's water reliability and is therefore discussed in this section.

In its 2010 Regional AWMP, Metropolitan chose the year 1977 as the single driest year since 1922 and the years 1990-1992 as the multiple driest years over that same period. These years have been chosen because they represent the timing of the least amount of available water resources from the SWP, a major source of Metropolitan's supply.

Over the 20-year period beginning in 2015 and ending in 2035, Metropolitan projects a 19.5 percent increase in available supply during an average year, a 15.8 percent increase during a single dry year, and a 19.5 percent increase as an average of the three-year multiple dry year.[52] However, on average over the 20-year period, supply in single dry years is only 78.4 percent of the supply corresponding to average years, and in multiple dry years is only 64.8 percent of the supply corresponding to average years. Therefore, demand is projected to remain lower than total available supply in all hydrologic scenarios.

In its 2010 Regional AWMP, Metropolitan also projects an increase in member agency demands. Specifically, Metropolitan projects a 5.0 percent increase over the same 20-year period in the average demand, a 6.8 percent increase during the single dry year

[52] Refer to Tables 4.12-1 and 4.12-2

scenario, and a 7.3 percent increase during the multiple dry year scenario. On average over the 20-year period, demand in single dry years will increase 110.2 percent from average years, and in multiple dry years will increase 113.5 percent from average years. In all cases, the projected regional increase in demands by member agencies are satisfied by anticipated available surpluses in the Metropolitan supply.

Table 4.12-1 summarizes Metropolitan's current imported supply availability projections for average and single dry years over the 20-year period between 2015 and 2030. Based on these projections, Metropolitan will be able to meet all of its projected single dry year service area demands through the year 2035.

Table 4.12-2 summarizes Metropolitan's current imported supply availability projections over the 20-year period beginning in 2015 and ending in 2035 for average and multiple dry year scenarios. When reviewing Table 4.12-2, it is important to note that Metropolitan is projecting a surplus of supply for all multiple dry year scenarios through 2035.

Based on Metropolitan's 2010 RAWMP and 2010 IRP, Tables 4.12-1 and 4.12-2 summarize Metropolitan's current imported supply availability and demand projections for average year, single dry year, and multiple dry years over the 20-year period beginning in 2015 and ending in 2035 expressed in terms of a percentage. The supply projections include current programs and programs under development as well as in-region storage and programs. Reference is made to Metropolitan's 2010 RAWMP for a description of these programs under development, but they include only programs Metropolitan is confident can be implemented and do not include other more speculative regional programs. Even if all the programs under development are removed, there are surpluses in all years and hydrologic scenarios.

When viewed on a regional basis, some of Metropolitan's member agencies and their sub-agencies demands will exceed the percent of average demand shown in the two aforementioned tables, while other Metropolitan member agencies or sub-agencies will have demands less than the percent of average demand. However, when viewed from the overall regional perspective, it is reasonable to assume that these averages will apply to all local water purveyors. Though a less conservative assumption might suggest surplus water supplies not used by agencies experiencing low or no growth may be freed up for use by those water purveyors experiencing more growth.

Metropolitan is projecting an 11.4 percent increase in total demand (including local supplies) over its entire service area between 2015 and 2035 (5,449,000 AFY to 6,069,000 AFY)[53] compared with a 12.6 percent increase in population over the same period of (19,956,000 million to 22,474,000 million).[54] In other words, Metropolitan's projected increase in demand roughly parallels its projected increase in population.

[53] Table 2-8 from Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010
[54] Table A.1-2 from Metropolitan Water District of Southern California,2010 Regional UWMP, November 2010

Table 4.12-1
Metropolitan Regional Imported Water Supply Reliability Projections for Average and Single Dry Years[55]
(AFY)

Region Wide Projections	2015	2020	2025	2030	2035
Supply					
Projected Supply During an Average Year[1]	4,073,000	4,499,000	5,140,000	4,998,000	4,865,000
Projected Supply During a Single Dry Year[1]	3,219,000	3,644,000	4,013,000	3,859,000	3,726,000
Projected Supply During a Single Dry Year as a % of Average Supply	**79.0%**	**81.0%**	**78.1%**	**77.2%**	**76.6%**
Demand					
Projected Demand During an Average Year	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
Projected Demand During a Single Dry Year	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
Projected Demand During a Single Dry Year as a % of Average Demand	**108.2%**	**111.8%**	**110.9%**	**110.0%**	**110.1%**
Surplus					
Projected Surplus During an Average Year	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000
Projected Surplus During a Single Dry Year	1,048,000	1,482,000	1,812,000	1,605,000	1,407,000
Additional Supply Information					
Projected Supply During an Average Year as a % of Demand During an Average Year	**203.0%**	**232.7%**	**258.9%**	**243.9%**	**231.0%**
Projected Supply During an Average Year as a % of Demand During a Single Dry Year	**187.6%**	**208.1%**	**233.5%**	**221.7%**	**209.8%**
Projected Supply During a Single Dry Year as a % of Single Dry Year Demand	**148.3%**	**168.5%**	**182.3%**	**171.2%**	**160.7%**

[1] Projected supplies include current supplies and supplies under development, but are limited by Metropolitan's 1.25 MAF allotment to Colorado River water; data obtained from Metropolitan's 2010 Regional AWMP, November 2010 supply/demand projections.

[55] Metropolitan Water District of Southern California, 2010 Regional AWMP, November 2010

Table 4.12-2
MWD Regional Imported Water Supply Reliability Projections for Average and Multiple Dry Years[56]
(AFY)

Region Wide Projections	2015	2020	2025	2030	2035
Supply					
Projected Supply During an Average Year[1]	4,073,000	4,499,000	5,140,000	4,998,000	4,865,000
Projected Supply as Average of the 3-year Multiple Dry Year Period[1]	2,652,000	2,970,000	3,253,000	3,214,000	3,170,000
Projected Supply During Year 3 of a Multiple Dry Year as a % of Average Supply	**65.1%**	**66.0%**	**63.3%**	**64.3%**	**65.2%**
Demand					
Projected Demand During an Average Year	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
Projected Demand as Average of the 3-year Multiple Dry Year Period	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
Projected Demand as Average of the 3-year of a Multiple Dry Year Period as a % of Average Demand	**111.5%**	**113.2%**	**115.0%**	**114.2%**	**113.9%**
Surplus					
Projected Surplus During an Average Year	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000
Projected Surplus as Average of the 3-year Multiple Dry Year Period	416,000	782,000	970,000	875,000	771,000
Additional Supply Information					
Projected Supply During an Average Year as a % of Demand During an Average Year	**203.0%**	**232.7%**	**258.9%**	**243.9%**	**231.0%**
Projected Supply During an Average Year as a % of Demand as an Average of the 3-year Multiple Dry Year Period	**182.2%**	**205.6%**	**225.1%**	**213.7%**	**202.8%**
Projected Supply During a Multiple Dry Year as a % of Multiple Dry Year Demand	**118.6%**	**135.7%**	**142.5%**	**137.4%**	**132.1%**

[1] Projected supplies include current supplies and supplies under development, but are limited by MWD's 1.25 MAF allotment to Colorado River water; supply is shown for the average of the three dry years rather than a year-by-year detail, because most of MWD's dry year supplies are designed to provide equal amounts of water over each year of the three-year period.

RCWD Supply Reliability as a Percentage of Normal Water Year Supply

Metropolitan's 2010 AWMP Update includes a supply reliability analysis that indicates the region will be able to meet 100 percent of its dry year demand under every hydrologic scenario through the year 2035. Based on historical supply reliability data consistent with Metropolitan, RCWD has identified supply reliability for imported water as 100

[56] Metropolitan Water District of Southern California, 2010 Regional UWMP, November 2010

percentage of normal water year supply and multiple dry water years. For groundwater, RCWD's current extraction capacity is 40,000 AFY and would remain consistent in a single dry water year. However, historically the Basin has been drawn down over multiple dry water years and extraction is reduced in succession to year three of a multiple dry year by about 6 percent, as shown in Table 4.12-3. The District is evaluating increased groundwater production capacity corresponding with increased import groundwater recharge. Table 4.12-3 shows the supply reliability percentages for dry year scenarios for RCWD.

Table 4.12-3
Supply Reliability as a Percentage of Normal Water Year Supply

Water Sources	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Imported	100%	100%	100%	100%	100%
Local (Groundwater)	100%	100%	98%	96%	94%
Recycled	100%	100%	100%	100%	100%

Source: Imported – Metropolitan indicates 100 percent reliable in all hydrologic conditions; Local and Recycled data from RCWD Operations Department

Tables 4.12-3 through 4.12-9 compare current and projected water supplies and demands in normal, single dry year and multiple dry year scenarios for the District. For this analysis, demands are considered consistent with normal year demands in all hydrologic conditions. This is, in part, because Metropolitan has indicated that even though supplies may decrease in single dry years and multiple dry years, it has significant storage and other programs to be 100 percent reliable to meet member agency demands in all hydrologic conditions. Based on the results presented in these tables, the District should not experience any problems in meetings its demands in normal, single dry and multiple dry year scenarios.

Table 4.12-4
Projected Water Supply and Demand
Normal Water Year
(AF)

Water Sources	2015	2020	2025	2030	2035
Imported					
Treated	46,950	51,134	55,623	59,901	64,390
Untreated – Groundwater Recharge	13,000	23,000	23,000	23,000	23,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)	26,500	26,500	26,500	26,500	26,500
Subtotal – Potable Water Supply	**90,460**	**104,634**	**109,123**	**113,401**	**117,890**
Recycled[1]					
SRWRF (RCWD)	3,440	4,000	4,000	4,000	4,000
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**99,504**	**114,238**	**118,727**	**123,005**	**127,494**
Demand					
Potable[2]	69,985	73,960	78,235	82,310	86,585
Recycled[3]	4,900	5,200	5,200	5,200	5,200
Total Demand	**74,885**	**79,160**	**83,435**	**87,510**	**91,785**
% of Year 2010 Demand (62,477 AF)	120%	127%	134%	140%	147%
Supply/ Demand Difference	24,619	35,078	35,292	35,495	35,709
Difference as % of Supply	24.7%	30.7%	29.7%	28.9%	28.0%
Difference as % of Demand	32.9%	44.3%	42.3%	40.6%	38.9%

Source: Demand and supply totals from Tables 4.10-1 and 4.10-3.

[1] Recycled water supply includes SRWRF current (2010) capacity of 3,160 AF, increased by 2880 AF in 2015 and another 560 AF in 2020; current EMWD agreement for TVWRF water is for up to 5,000 AFY.

[2] The rate of potable demand increase from 2015 to 2035 is projected to be consistent with the rate of service area population increase over the same period. Potable demand includes water conveyed outside the RCWD service area.

[3] Recycled water demand includes water conveyed outside the RCWD service area.

Table 4.12-5
Projected Water Supply and Demand
Single Dry Water Year
(AF)

Water Sources	2015	2020	2025	2030	2035
Supply	Single Dry Years				
Imported					
Treated	46,960	51,134	55,623	59,901	64,390
Untreated – Groundwater Recharge	13,000	23,000	23,000	23,000	23,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)[1]	26,500	26,500	26,500	26,500	26,500
Subtotal – Potable Water Supply	**90,460**	**104,634**	**109,123**	**113,401**	**117,890**
Recycled[2]					
SRWRF (RCWD)	3,440	4,.000	4,000	4,000	4,000
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**99,504**	**114,238**	**118,727**	**123,005**	**127,494**
Normal Year Supply	**99,504**	**114,238**	**118,727**	**123,005**	**127,494**
% of Normal Year	100.0%	100.0%	100.0%	100.0%	100.0%
Demand					
Potable[3]	69,985	73,960	78,235	82,310	86,585
Recycled[4]	4,900	5,200	5,200	5,200	5,200
Total Demand	**74,885**	**79,160**	**83,435**	**87,510**	**91,785**
Normal Year Demand	74,885	79,160	83,435	87,510	91,785
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
Supply/ Demand Difference	24,619	35,078	35,292	35,495	35,709
Difference as % of Supply	24.7%	30.7%	29.7%	28.9%	28.0%
Difference as % of Demand	32.9%	44.3%	42.3%	40.6%	38.9%

[1] Single dry year groundwater supplies are projected to equal approximately 100% of normal year groundwater supplies.

[2] Recycled water supply includes SRWRF current (2010) capacity of 3,160 AF, increased by 2880 AF in 2015 and another 560 AF in 2020; current EMWD agreement for TVWRF water is for up to 5,000 AFY.

[3] Potable water demands during a single dry year are estimated to equal 100 percent of potable water demand during a normal year because of the climatic region of RCWD. Includes water conveyed outside of RCWD service area.

[4] Recycled water demands and supply are not dependent on climatic conditions; therefore, recycled water demands are equal to 100 percent of recycled water demand during a normal year. Includes water conveyed outside of RCWD service area.

Table 4.12-6
Projected Water Supply and Demand
Multiple Dry Water Years 2011-2015[57]
(AF)

Water Sources	2011	2012	2013	2014	2015
Supply	Normal Years		Multiple Dry Years		
Imported					
Treated[1]	33,283	36,702	40,122	43,541	46,960
Untreated – Groundwater Recharge	13,000	13,000	13,000	13,000	13,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)[2]	24,945	25,334	25,208	25,067	24,910
Subtotal – Potable Water Supply	**75,228**	**79,036**	**82,330**	**85,608**	**88,870**
Recycled[3]					
SRWRF (RCWD)	3,160	3,160	3,160	3,160	3,440
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**83,992**	**87,800**	**91,094**	**94,372**	**97,914**
Normal Year Supply	83,992	87,800	91,426	95,465	99,504
% of Normal Year	100.0%	100.0%	99.6%	98.9%	98.4%
Demand					
Potable[4]	60,231	62,670	65,108	67,547	69,985
Recycled[3]	4,727	4,770	4,814	4,857	4,900
Total Demand	**64,958**	**67,440**	**69,922**	**72,404**	**74,885**
Normal Year Demand	64,958	67,440	69,922	72,404	74,885
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
Supply/ Demand Difference	19,034	20,360	21,172	21,968	23,029
Difference as % of Supply	22.7%	23.2%	23.2%	23.3%	23.5%
Difference as % of Demand	29.3%	30.2%	30.3%	30.3%	30.8%

[1] While Metropolitan indicates treated imported supplies are adjusted during multiple dry years to reflect Metropolitan supply capability, they also indicated 100 percent reliability to meet member agency demands in all hydrologic conditions.
[2] Groundwater supplies are projected to be 100 reliable in the first year of a drought, and reduce 2 percent per year for the next three years (refer to Table 4.12-3).
[3] Recycled water demands and supply are not dependent on climatic conditions; therefore, recycled water demands are equal to 100 percent of recycled water demand during a normal year.
[4] Historic demand data for potable water supplies has shown that demand varies marginally and is therefore negligible.

[57] All supply and demand factors for multiple dry year periods referenced in the footnotes to the tables are based on the three-year dry period 1990-1992. However, based on substantial growth combined with drought factors, demand factors during all hydrologic conditions remain constant.

Table 4.12-7
Projected Water Supply and Demand
Multiple Dry Water Years 2016-2020[58]
(AF)

Water Sources	2016	2017	2018	2019	2020
Supply	Normal Years		Multiple Dry Years		
Imported					
Treated[1]	47,795	48,630	49,464	50,299	51,134
Untreated – Groundwater Recharge	13,000	13,000	13,000	21,000	23,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)[2]	26,500	26,500	25,970	25,440	24,910
Subtotal – Potable Water Supply	**91,295**	**92,130**	**92,434**	**100,739**	**103,044**
Recycled[3]					
SRWRF (RCWD)	3,440	3,440	3,440	3,440	4,000
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**100,339**	**101,174**	**101,478**	**109,783**	**112,648**
Normal Year Supply	100,339	101,174	108,344	111,291	114,238
% of Normal Year	100.0%	100.0%	93.7%	98.6%	98.6%
Demand					
Potable[4]	70,780	71,575	72,370	73,165	73,960
Recycled[3]	4,960	5,020	5,080	5,140	5,200
Total Demand	**75,740**	**76,595**	**77,450**	**78,305**	**79,160**
Normal Year Demand	75,740	76,595	77,450	78,305	79,160
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
Supply/ Demand Difference	24,599	24,579	24,028	31,478	33,488
Difference as % of Supply	24.5%	24.3%	23.7%	28.7%	29.7%
Difference as % of Demand	32.5%	32.1%	31.0%	40.2%	42.3%

[1] While Metropolitan indicates treated imported supplies are adjusted during multiple dry years to reflect Metropolitan supply capability, they also indicated 100 percent reliability to meet member agency demands in all hydrologic conditions.
[2] Groundwater supplies are projected to be 100 reliable in the first year of a drought, and reduce 2 percent per year for the next three years (refer to Table 4.12-3).
[3] Recycled water demands and supply are not dependent on climatic conditions; therefore, recycled water demands are equal to 100 percent of recycled water demand during a normal year.
[4] Historic demand data for potable water supplies has shown that demand varies marginally and is therefore negligible.

[58] All supply and demand factors for multiple dry year periods referenced in the footnotes to the tables are based on the three-year dry period 1990-1992.

Table 4.12-8
Projected Water Supply and Demand
Multiple Dry Water Years 2021-2025[59]
(AF)

Water Sources	2021	2022	2023	2024	2025
Supply	Normal Years		Multiple Dry Years		
Imported					
Treated[1]	52,032	52,929	53,827	54,725	55,623
Untreated – Groundwater Recharge	13,000	13,000	13,000	13,000	23,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)[2]	26,500	26,500	25,970	25,440	24,910
Subtotal – Potable Water Supply	**95,532**	**96,429**	**96,797**	**97,165**	**107,533**
Recycled[3]					
SRWRF (RCWD)	4,000	4,000	4,000	4,000	4,000
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**105,136**	**106,033**	**106,401**	**106,769**	**117,137**
Normal Year Supply	105,136	106,033	106,931	107,829	118,727
% of Normal Year	100.0%	100.0%	99.5%	99.0%	98.7%
Demand					
Potable[4]	74,815	75,670	76,525	77,380	78,235
Recycled[3]	5,200	5,200	5,200	5,200	5,200
Total Demand	**80,015**	**80,870**	**81,725**	**82,580**	**83,435**
Normal Year Demand	80,015	80,870	81,725	82,580	83,435
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
Supply/ Demand Difference	25,121	25,163	24,676	24,189	33,702
Difference as % of Supply	23.9%	23.7%	23.2%	22.7%	28.8%
Difference as % of Demand	31.4%	31.1%	30.2%	29.3%	40.4%

[1] While Metropolitan indicates treated imported supplies are adjusted during multiple dry years to reflect Metropolitan supply capability, they also indicated 100 percent reliability to meet member agency demands in all hydrologic conditions.
[2] Groundwater supplies are projected to be 100 reliable in the first year of a drought, and reduce 2 percent per year for the next three years (refer to Table 4.12-3).
[3] Recycled water demands and supply are not dependent on climatic conditions; therefore, recycled water demands are equal to 100 percent of recycled water demand during a normal year.
[4] Historic demand data for potable water supplies has shown that demand varies marginally and is therefore negligible.

[59] All supply and demand factors for multiple dry year periods referenced in the footnotes to the tables are based on the three-year dry period 1990-1992.

Table 4.12-9
Projected Water Supply and Demand
Multiple Dry Water Years 2026-2030[60]
(AF)

Water Sources	2026	2027	2028	2029	2030
Supply	Normal Years		Multiple Dry Years		
Imported					
Treated[1]	56,478	57,334	58,190	59,046	59,901
Untreated – Groundwater Recharge	23,000	23,000	23,000	23,000	23,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)[2]	26,500	26,500	25,970	25,440	24,910
Subtotal – Potable Water Supply	**109,978**	**110,834**	**111,160**	**111,486**	**111,811**
Recycled[3]					
SRWRF (RCWD)	4,000	4,000	4,000	4,000	4,000
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**119,582**	**120,438**	**120,764**	**121,090**	**121,415**
Normal Year Supply	119,582	120,438	121,294	122,150	123,005
% of Normal Year	100.0%	100.0%	99.6%	99.1%	98.7%
Demand					
Potable[4]	79,050	79,865	80,680	81,495	82,310
Recycled[3]	5,200	5,200	5,200	5,200	5,200
Total Demand	**84,250**	**85,065**	**85,880**	**86,695**	**87,510**
Normal Year Demand	84,250	85,065	85,880	86,695	87,510
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
Supply/ Demand Difference	35,332	35,373	34,884	34,395	33,905
Difference as % of Supply	29.5%	29.4%	28.9%	28.4%	27.9%
Difference as % of Demand	41.9%	41.6%	40.6%	39.7%	38.7%

[1] While Metropolitan indicates treated imported supplies are adjusted during multiple dry years to reflect Metropolitan supply capability, they also indicated 100 percent reliability to meet member agency demands in all hydrologic conditions.
[2] Groundwater supplies are projected to be 100 reliable in the first year of a drought, and reduce 2 percent per year for the next three years (refer to Table 4.12-3).
[3] Recycled water demands and supply are not dependent on climatic conditions; therefore, recycled water demands are equal to 100 percent of recycled water demand during a normal year.
[4] Historic demand data for potable water supplies has shown that demand varies marginally and is therefore negligible.

[60] All supply and demand factors for multiple dry year periods referenced in the footnotes are based on the three-year dry period 1990-1992.

Table 4.12-10
Projected Water Supply and Demand
Multiple Dry Water Years 2031-2035[61]
(AF)

Water Sources	2031	2032	2033	2034	2035
Supply	Normal Years		Multiple Dry Years		
Imported					
Treated[1]	60,799	61,697	62,595	63,492	64,390
Untreated – Groundwater Recharge	23,000	23,000	23,000	23,000	23,000
Untreated – SMR Discharges	4,000	4,000	4,000	4,000	4,000
Local (Groundwater)[2]	28,800	31,100	25,970	25,440	24,910
Subtotal – Potable Water Supply	**116,599**	**119,797**	**115,565**	**115,932**	**116,300**
Recycled[3]					
SRWRF (RCWD)	4,000	4,000	4,000	4,000	4,000
TVWRF (EMWD)	5,604	5,604	5,604	5,604	5,604
Total Supply	**126,203**	**129,401**	**125,169**	**125,536**	**125,904**
Normal Year Supply	126,203	129,401	125,699	126,596	127,494
% of Normal Year	100.0%	100.0%	99.6%	99.2%	98.8%
Demand					
Potable[4]	83,165	84,020	84,875	85,730	86,585
Recycled[3]	5,200	5,200	5,200	5,200	5,200
Total Demand	**88,365**	**89,220**	**90,075**	**90,930**	**91,785**
Normal Year Demand	88,365	89,220	90,075	90,930	91,785
% of normal year demand	100.0%	100.0%	100.0%	100.0%	100.0%
Supply/ Demand Difference	37,838	40,181	35,094	34,606	34,119
Difference as % of Supply	30.0%	31.1%	28.0%	27.6%	27.1%
Difference as % of Demand	42.8%	45.0%	39.0%	38.1%	37.2%

[1] While Metropolitan indicates treated imported supplies are adjusted during multiple dry years to reflect Metropolitan supply capability, they also indicated 100 percent reliability to meet member agency demands in all hydrologic conditions.
[2] Groundwater supplies are projected to be 100 reliable in the first year of a drought, and reduce 2 percent per year for the next three years (refer to Table 4.12-3).
[3] Recycled water demands and supply are not dependent on climatic conditions; therefore, recycled water demands are equal to 100 percent of recycled water demand during a normal year.
[4] Historic demand data for potable water supplies has shown that demand varies marginally and is therefore negligible.

[61] All supply and demand factors for multiple dry year periods referenced in the footnotes are based on the three year dry period 1990-1992.

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SECTION 5
CLIMATE CHANGE

5.1 VULNERABILITY OF SUPPLY TO SEASONAL OR CLIMATIC SHORTAGE

The District's climate is a semi-arid environment with mild winters, warm summers and moderate rainfall, consistent with coastal and inland Southern California. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The usually mild to warm climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

Climatological data in California has been recorded since the year 1858. During the twentieth century, California has experienced three periods of severe drought: 1928-34, 1976-77 and 1987-91. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by the DWR. These rivers flow into the San Francisco Bay Delta and are the source of water for the SWP. Southern California and, in particular, the southwest Riverside County area, sustained few adverse impacts from the 1976-77 drought, due in large part to the availability of Colorado River water and groundwater in the Murrieta-Temecula Basin. In contrast, the 1987-91 drought created considerably more concern for Southern California.

While the data presented in Section 4 indicates water availability during single and multiple dry year scenarios, response to a future drought would follow the water use efficiency mandates of Metropolitan's WSDM Plan, along with implementation of the appropriate stage of the District's Water Shortage Contingency Plan. These programs are discussed more specifically in Section 2.

5.2 ASSESSING REGIONAL VULNERABILITY TO CLIMATE CHANGE

Vulnerability is the degree to which a system is exposed to, susceptible to, and able to cope with and adapt to, the adverse effect of climate change. The District is a partner in the Upper Santa Margarita Watershed (USMW) Integrated Regional Water Management (IRWM) Plan, which is currently being updated. The Update includes an assessment of vulnerabilities to climate change, and will be complete by early 2014. Assessing potential climate change vulnerabilities is much more efficient with regional collaboration (Natural Resources Defense Council 2007). Information from the 2014 IRWM Plan Update will be used to prepare the 2015 AWMP Update.

Until that time, climate change information has been prepared by agencies that provide water to RCWD. Historically, groundwater has supplied between 25 and 40 percent of the District's total water supply, imported water has supplied between 60 and 70 percent, and recycled water has provided less than 5 percent. Groundwater is less vulnerable to than imported water, and recycled water is considered "drought proof". The District is maximizing groundwater through the implementation of the Vail Lake Stabilization and

Conjunctive Use Project. However, imported water, from the State Water Project and the Colorado River, remains the most vulnerable to climate change.

The U.S. Bureau of Reclamation's 2011 Secure Water Act Report identifies the following climate challenges the Colorado River Basin could likely face[62]:

- On average, Colorado River Basin temperature is projected to increase by 5-6 ^{o}F during the 21st century with slightly larger increased projected in the upper Colorado Basin.
- Precipitation is projected to increase by 2.1 percent in the upper basin while declining by 1.6 percent in the lower basin by 2050.
- Mean annual runoff is projected to decrease by 8.5 percent by 2050.
- Warmer conditions will likely transition snowfall to rainfall, producing more December–March runoff and less April–July runoff.

These challenges have the following potential impacts for the Colorado River Basin:

- Spring and early summer runoff reductions could translate into a drop in water supply for meeting irrigation demands and adversely impacting hydropower operations at smaller reservoirs.
- Increased winter runoff may require infrastructure modification or flood control rule changes to preserve flood protection, which could further reduce warm season water supplies.
- Warmer conditions might result in increased stress on fisheries, shifts in species geographic ranges, increased water demands for instream ecosystems and thermoelectric power production, increased power demands for municipal uses, and increase likelihood of invasive species infestation.
- Endangered species issues might be exacerbated.
- Warming could also lead to significant reservoir evaporation, increased agricultural demands and losses during water conveyance and irrigation.

Where opportunities exist, Reclamation has begun adaptation actions in response to climate stresses as well as land use, population growth, invasive species and others. These activities include extending water supplies, water conservation, hydropower production, planning for future operations and supporting rural water development.
DWR has compiled a summary of key climate change impacts anticipated on California's water resources[63]:

- Seasonal needs associated with agricultural water use are expected to increase. Non-irrigated agriculture and rangeland will be especially vulnerable to reduced

[62] Westwide Climate Assessment, U.S. Bureau of Reclamation, 2011.
[63] Climate Change Handbook for Regional Water Planning, Section 4, Assessing Regional Vulnerability to Climate Change, US Environmental Protection Agency Region 9 and California Department of Water Resources, November 2011

surface flows and soil moisture.

- Evapotranspiration rates are expected to increase, which will increase agricultural water demands.
- A longer growing season will also increase agricultural water demands.
- Snowpack quantity is expected to decrease overall as snowlines recede.
- Snowmelt runoff timing is expected to shift as flows increase in the winter and decrease in the late spring/early summer. This could result in shifted timing of flood control dam functionality and changes in reservoir storage throughout the year.
- While precipitation projections are less definitive than other climate change variables, there is general consensus that precipitation in the Southwestern U.S. will decline over the second half of the 21st Century.
- SWP, Central Valley Project, and Colorado River supplies are expected to be subject to environmental flow restrictions and other flow limitations, which may become more difficult to meet as climate changes.
- Droughts are expected to be more severe and potentially more frequent.
- Eutrophication is expected to occur more often in surface waters as water temperatures increase.
- Longer low-flow conditions may lead to higher contaminant concentrations.
- High turbidity is expected to become more of a concern as storm severity increases and wildfires become more frequent.
- Other water quality issues that typically accompany severe storms (such as spikes in E. coli or cryptosporidium) are expected to become more frequent.
- Pollutant loads may increase with more intense storms.
- Increased salinity intrusion into estuaries and brackish environments as seasonal freshwater flows decrease and sea levels rise.
- Higher volumes of floodwater are anticipated as more precipitation falls as rain.
- Changes in migration patterns and species distribution are anticipated.
- Aquatic and terrestrial invasive species may spread in some areas.
- Certain habitats, such as estuaries and other coastal habitats, are especially vulnerable to climate change effects.
- Certain species, such as Sequoia and Redwood trees and some temperature-sensitive fish species, are especially sensitive to climate change.
- Water quality issues associated with increased erosion and sedimentation may be detrimental to some benthic and aquatic communities.

In coordination with the climate change analysis for the USMW IRWM Plan Update, the District will consider its water resources that are specifically vulnerable to climate change along with prioritization factors specific to the region to prioritize the identified vulnerabilities and identify how to most effectively allocate resources through the planning horizon. Identification of highly vulnerable water resources, especially those that expose the District to high levels of risk, should lead to the development of objectives (and performance metrics) that result in and measure adaptation to climate change.

SECTION 6
EFFICIENT WATER MANAGEMENT PRACTICES

6.1 INTRODUCTION

Efficient Water Management Practices (EWMPs) for agriculture were established as part of California Assembly Bill 3616, Agricultural Efficient Water Management Act of 1990, and were officially defined on January 1, 1999 by an advisory committee consisting of State, federal, and local agencies; agricultural communities; the California university system; environmental and public interest groups; and other interested parties in a Memorandum of Understanding (MOU) establishing the Agricultural Water Management Council (AWMC). These EWMPs were later included in California Senate Bill X7-7 (SB X7-7) on November 9, 2009 as mandated water use efficiency targets for agricultural water suppliers.

EWMPs refer to policies, programs, rules, and other activities conducted by a water supplier that, over the long-term, have been generally justified and accepted by the industry as providing for the advancement of the efficient use of water used for agricultural purposes in California. RCWD recognizes agricultural water use efficiency as an integral component of current and future water supply development and reliability strategies for its service area. The District has made implementation of EWMPs the cornerstone of its agricultural water use efficiency programs and efforts. Details regarding these programs and efforts are provided throughout section 6 of this AWMP.

6.2 EFFICIENT WATER MANAGEMENT PRACTICES

Critical activities and conditional activities are the two general classes of EWMPs defined in SB X7-7. Critical activities must be implemented by agricultural water suppliers and include requirements for accurate measurement of water deliveries to individual farming operations and for adopting a pricing structure for agricultural water customers based at least in part on quantity of water delivered. Conditional activities are those that must be implemented by agricultural water suppliers if they are locally cost-effective and technically feasible. Table 6.2-1 lists EWMPs as required by the Act.

Table 6.2-1
Agricultural Water Management Planning Act
Required Efficient Water Management Practices

CRITICAL (REQUIRED)	
1	Measure the volume of water delivered to customers with sufficient accuracy.
2	Adopt a pricing structure for water customers based on at least in part on quantity delivered.
CONDITIONAL (REQUIRED IF LOCALLY COST EFFECTIVE AND TECHNICALLY FEASIBLE)	
1	Facilitate alternate land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.
2	Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.
3	Facilitate the financing of capital improvements for on-farm irrigation systems.
4	Implement an incentive pricing structure that promotes one or more of the following goals: a. More efficient water use at the farm level. b. Conjunctive use of groundwater. c. Appropriate increase of groundwater recharge. d. Reduction in problem drainage. e. Improved management of environmental resources. f. Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.
5	Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.
6	Increase flexibility in water ordering by, and delivery to, water customers within operational limits.
7	Construct and operate supplier spill and tailwater recovery systems.
8	Increase planned conjunctive use of surface water and groundwater within the supplier service area.
9	Automate canal control structures.
10	Facilitate or promote customer pump testing and evaluation.
11	Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.
12	Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following: a. On-farm irrigation and drainage system evaluations. b. Normal year and real-time irrigation scheduling and crop ETo information. c. Surface water, groundwater, and drainage water quality and quality data. d. Agricultural water management educational programs and materials for farmers, staff, and the public.
13	Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow for more flexible water deliveries and storage.
14	Evaluate and improve the efficiencies of the supplier's pumps.

6.3 DETERMINATION OF EWMP IMPLEMENTATION – CURRENT AND PLANNED

SB X7-7 requires agricultural water suppliers to implement the EWMPs on or before July 31, 2012. The District has committed to use good-faith efforts to implement all 16 of them by that deadline. While many of the EWMPs are implemented exclusively by RCWD with funding allocated annually to the District's operating budget, some of them are implemented by the District through funding partnerships with other agencies. The US Bureau of Reclamation (Reclamation), DWR, Metropolitan, and WMWD cost share with the District on providing water management services to its agricultural water users and for financing capital improvements for on-farm irrigation systems. Reclamation has also provided significant funding for the construction of the Vail Lake Pipeline and Pump Station, which will ultimately lead to increased conjunctive use and distribution system flexibility, while Metropolitan works with the District on finding opportunities for financing crop replacement projects that result in water savings. In addition, Southern California Edison provides free pump testing services that allow the District and its customers to evaluate the efficiency of their well and booster pumps.

Status of EWMPs

Table 6.3-1 provides a summary of the implementation status of each of the EWMPs, and estimated water use efficiency improvements that will result from their implementation. The table is followed by a narrative providing details of the RCWD's efforts related to the implementation of each of the EWMPs.

Table 6.3-1
Status of RCWD
Efficient Water Management Practices

EWMP No.	Description of EWMP Implemented	Estimate of Water Use Efficiency Improvements That Occurred Since Last Report	Description of EWMP Planned	Description of EWMP Demonstrably Inappropriate	Estimated Water Use Efficiency Improvements 5-10 Years into the Future
Critical EWMPs					
1	Accurately measure the volume of water delivered	No improvements made since last report.	___	___	Modified District Administrative Code to include better procedures for meter testing, repair, and replacement. (Completed April 2012)
2	Adopt a pricing structure based on quantity delivered	No improvements made since last report.	___	___	No future improvements anticipated.

EWMP No.	Description of EWMP Implemented	Estimate of Water Use Efficiency Improvements That Occurred Since Last Report	Description of EWMP Planned	Description of EWMP Demonstrably Inappropriate	Estimated Water Use Efficiency Improvements 5-10 Years into the Future
Conditionally Required EWMPs (locally cost effective and technically feasible)					
1	Facilitate alternative land use	No improvements made since last report.	___	___	District to begin facilitating Water Savings Incentive Program through Metropolitan. Offers financial incentives for crop replacement that reduces crop water requirements.
2	___	___	Facilitate use of available recycled water	___	IPR Facility expands recycled water infrastructure to serve agricultural customers. IPR to provide 3,586 AFY additional supply by 2018.
3	Facilitate the financing of capital improvements for irrigation systems	Distribution uniformity for 36 on-farm irrigation systems improved by average of 25%.	___	___	Distribution uniformity for 63 additional on-farm irrigation systems improved by an average of 25%.
4	Implement an incentive pricing structure	Tiered rate pricing structure adopted in 2007.Contributed to decreased agricultural demand throughout District.	___	___	No future improvements planned.
5	Expand line or pipe distribution systems, and construct regulatory reservoirs	Completed Integrated Resources Plan, initiated Vail Lake Pipeline and Pump Station Project.	___	___	Vail Lake Pipeline and Pump Station Project scheduled for completion in mid-2013. Increases storage by 4,521 AFY.
6	___	___	___	Increase flexibility in water ordering by and delivery to water customers	___
7	___	___	___	Construct and operate supplier spill and tailwater recovery systems	___

EWMP No.	Description of EWMP Implemented	Estimate of Water Use Efficiency Improvements That Occurred Since Last Report	Description of EWMP Planned	Description of EWMP Demonstrably Inappropriate	Estimated Water Use Efficiency Improvements 5-10 Years into the Future
8	Increase planned conjunctive use of surface water and groundwater	Increased groundwater production over the past 10 years through artificial recharge and natural yield.	___	___	VDC Conjunctive Use Project will increase recharge of groundwater basin from 12,187 AF (2010) to 25,000 AFY by 2018.
9	___	___	___	Automate canal control structures	___
10	Facilitate or promote customer pump testing and evaluation	Customers who operate wells are informed of the availability of free pump testing services through the regional electrical utility.	___	___	No future improvements anticipated.
11	Designate a water conservation coordinator	A water conservation coordinator has been designated by the District.	___	___	No future improvements anticipated.
12	Provide for the availability of water management services to water users	Facilitated 138 irrigation system evaluations, provided locations for two CIMIS stations, provided water quality information to customers	___	___	62 additional irrigation system evaluations, install four more ETo data stations, continue to provide water quality information to customers, and provide valuable water use efficiency tools/data to growers via RCWD's website
13	Evaluate the policies of agencies	No improvements made since last report.	___	___	No future improvements anticipated.
14	Evaluate and improve the efficiencies of the supplier's pumps	Each well and booster pump is tested annually and bi-annually, respectively. Pumps operating below efficiency industry standards are repaired or replaced.	___	___	No future improvements anticipated.

CRITICAL EWMPs (Required)

EWMP 1: Measure the Volume of Water Delivered to Customers with Sufficient Accuracy

The points at which water is delivered from RCWD's delivery system to each of its agricultural customers consist of a variety of different water meter types including nutating disk, turbine, high pressure turbine, and compound meters. The majority of these meters are read automatically using AMR technology, which can be read remotely and as often as is necessary. All agricultural points of connection are physically accessible to District staff, and are read, at a minimum, on a monthly basis through an automatic (AMR) or manual process. Table 6.3-2 shows the different types of metering devices used by the District to deliver water to agricultural properties, and the accuracy of each of the device types as published by their manufacturer.

Table 6.3-2
RCWD Water Meters

Manufacturer	Type	Size	Accuracy %
Badger	Nutating Disc	¾"	-1% to 1%
Badger	Nutating Disc	1"	-3% to 1%
Badger	Nutating Disc	1 ½"	-3% to 1%
Badger	Nutating Disc	2"	-3% to 1%
Badger	Turbine	2"	-1% to 1%
Meinecke	High Pressure Turbine	2"	-1% to 1%
Badger	Compound	3"	-3% to 1%
Badger	Turbine	3"	-0.5% to 1.5%
Badger	Turbine	4"	-2% to 1%
Badger	Compound	4"	-2.5% to 1%
Badger	Compound	6"	-5% to 0.5%

Each of the manufacturers who supply the water meters used by the District for delivering water to agricultural customers test their meters for accuracy under laboratory conditions and comply with accuracy standards for water measurement regulation. To ensure compliance over the long term, RCWD's Board of Directors approved a modification to the District's Administrative Code in April 2012 to include procedures for the periodic testing, repair, and replacement of water meters. Following is the modification to section 1.7.18 of the Rules and Regulations Governing Water System Facilities and Service, now included in Part III, Chapter 1, Section 1 of the District's Administrative Code.

> **Meter Testing, Repair, and Replacement**
> Meters will be thoroughly inspected for excessive wear during testing and rebuilt or replaced, as required. In addition, when there is uncertainty regarding the accuracy of any size meter within the District, the meter will be tested by staff. Meter sizes ¾" through 2" will be replaced, while meters sized 3" and above will either be rebuilt or replaced if a problem is found.

A. Initial Test. Prior to installation, each meter will be tested by the manufacturer or by the District.

B. Large Meter Testing.

Meter Sizes 3" to 4": annually for meters with usage over 10,000 HCF per year; biannually for meters with usage of less than 10,000 HCF and greater than 5,000 HCF per year; and every 5 years for meters with usage of less than 5,000 HCF per year.

Meter Sizes Larger Than 4": all meters larger than 4" with usage will be tested on an annual basis.

C. On Customer's Request. A customer may, by giving not less than one week's notice, request the District to test the meter serving customer's premises. The District will require the customer to deposit the current fee to cover cost of the test, as indicated in the Customer Guide to Rates & Charges.

D. Replacement Criteria.

Meter Sizes ¾" through 2": to be replaced every 15 years, at 100,000 HCF consumption, or when not testing within specifications.

Meter Sizes 3" and Above: will be evaluated during the testing process and either be repaired or replaced, as required.

EWMP 2: Adopt a Pricing Structure for Water Customers Based on at Least in Part on Quantity Delivered

RCWD maintains a pricing structure for all of its customers based on the quantity of water delivered. Details regarding the pricing structure for RCWD's agricultural customers are provided in the description of Conditional EWMP 4 implementation.

CONDITIONAL EWMPs (Locally Cost Effective and Technically Feasible)

EWMP 1: Facilitate alternate land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage

The main crop types within RCWD's service area are perennial and include winegrapes, citrus, and avocados. Relative to other crops grown within the region and throughout the State, the volume of water required for growing these crops is not "exceptionally high." Table 6.3-3 shows a comparison between the water requirements of crops grown within the service area and other crops grown throughout the region (ET Zone 6).

Table 6.3-3
Crop Water Requirements*
1997 (Typical Year)

Crop Type	Annual Water Requirement (inches)	Annual Water Requirement (ETo %)
Grass (Reference ETo)	51.46	100%
Apples, Plums, Cherries, etc. w/ cover crop	50.98	99%
Almonds w/ cover crop	47.16	92%
Alfalfa, Hay and Clover	46.13	90%
Pasture & Misc. Grasses	46.42	90%
Citrus	35.91	70%
Avocados	35.40	69%
Grapes w/ 40% cover crop	18.75	36%

*Data included in this table is summarized from Cal Poly San Luis Obispo's Irrigation Training and Research Center's Report 03-001: California Crop and Soil Evapotranspiration *For Water Balances and Irrigation Scheduling/Design*

Furthermore, the irrigation of local crops involves micro irrigation systems consisting of low-flow micro-spinning and/or drip emitters with precipitation rates that do not exceed the infiltration rates of the locally farmed soils, which are for the most part, coarse in texture. Therefore, irrigated agriculture is not a major contributor to runoff or ponding within RCWD's service area. Generally, any deep percolation of irrigation water beyond the root zones of local crops drains to the local aquifer as groundwater recharge, or to Temecula Creek, Murrieta Creek, or the Upper Santa Margarita River.

Although implementation of this EWMP is not appropriate for RCWD's farming community, the District is in the process of collaborating with its water suppliers to implement a Water Savings Incentive Program, which facilitates alternate land use through the offering of financial incentives for replacing crops with lower water use varieties. This program is slated for implementation starting in late 2012.

EWMP 2: Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils

RCWD maintains a water reclamation facility and a recycled water distribution system, which supply a current demand of approximately 4,000 acre feet per year to dedicated landscape customers. The typical TDS of recycled water provided by RCWD is 750 mg/L. This exceeds the 500 mg/L TDS level that is permitted for application within the local Basin where a significant portion of the agricultural irrigation takes place within RCWD's service area. Furthermore, the crops being grown outside of the area where these TDS limitations exist consist primarily of avocados, which are known to have extremely low tolerance to chlorides. The typical chloride levels of RCWD's recycled water is 175 mg/L, while the tolerance of avocado trees to chloride concentrations is below 100 mg/L.

However, in the interest of maximizing water resources within the District's service area, the District investigated the use of demineralized wastewater for agricultural supply in the Santa Rosa Division, and raw untreated imported water in the eastern Rancho Division. In 2007, the RCWD completed a Demineralization and Non-Potable Water Conversion Feasibility Study, which examined a series of technically innovative approaches for the demineralization of wastewater and associated disposal of reject brine. In 2010, an update to the 2007 Study was prepared, which presented treatment alternatives, and updated cost and avoided cost estimates. An Indirect Potable Reuse (IPR) project was considered as an alternative in the 2010 analysis, which concluded that an IPR project is a feasible option for the production of recycled water within RCWD's service area.

The District is in now the process of completing a comprehensive IPR Study to explore options for expanding its recycled water distribution system to provide recycled water to agricultural customers while complying with local Basin Plan Groundwater TDS Objectives and mitigating the intolerance of local crops to salt concentrations found in recycled water. The IPR Study outlines the option of tertiary treatment and transportation of reclaimed water from RCWD's existing water reclamation facility to a proposed Advanced Water Purification Facility for further treatment before being pumped to Vail Lake or the local groundwater basin for storage where it would be captured by groundwater wells and used for water supply by RCWD domestic and agricultural customers. The feasibility analysis and preliminary design study of the IPR project is scheduled to conclude in January 2013 with a project concept for subsequent CEQA analysis, permitting, design and construction. The study will also include brine management and disposal options.

EWMP 3: Facilitate the Financing of Capital Improvements for On-farm Irrigation Systems

Since 2010, RCWD has implemented an Agricultural Irrigation Efficiency Program (AIEP/Program), which offers financial incentives to local farmers for improving the efficiency of on-farm irrigation systems. The original intent of the Program was to assist a few farmers by providing them with technical assistance and reimbursing them for 50 percent of the equipment costs required for irrigation system retrofits that improve distribution uniformity. More recently, additional funding made available through grant

awards and partnerships has made the AIEP available to a greater number of farmers, increased the agency cost share amount available to farmers for the irrigation system retrofits, and broadened the types of irrigation system improvement projects that are eligible for funding.

To date, California Department of Water Resource's Proposition 84 Implementation Grant funding awarded to RCWD has helped pay for 138 agricultural irrigation system audits. Figure 6-1 shows the results of these audits, which confirms that the majority of the irrigation systems tested for distribution uniformity operated at a level below that which is considered "good" by industry standards.

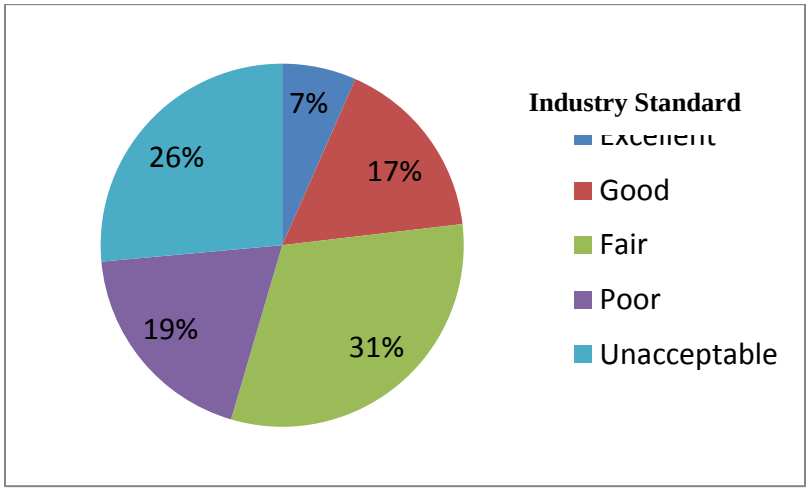

Figure 6-1
Pre-Retrofit Irrigation System Audit Results

Of the 138 irrigation systems that were tested for distribution uniformity, 36 have been improved through equipment retrofits financed under the AIEP. Figure 6-2 quantifies these improvements in terms of increases in distribution uniformity percentage.

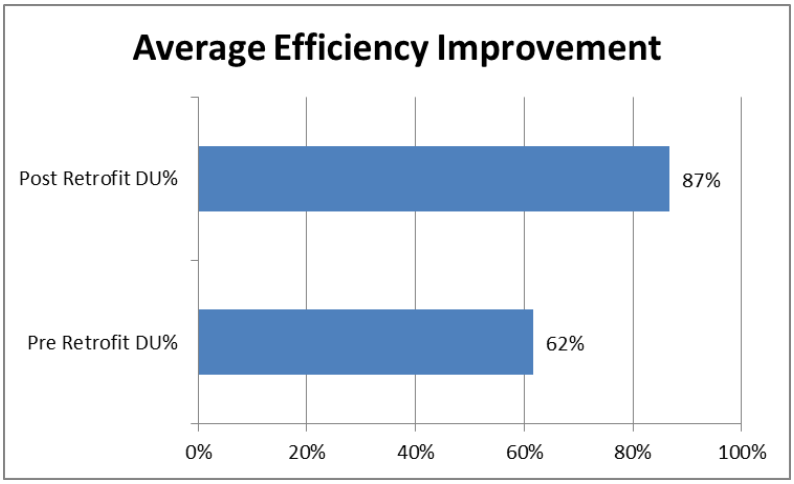

Figure 6-2
Average Efficiency Improvement in Distribution Uniformity (DU)

Approximately $150,000 has been provided to the 36 customers for their irrigation system retrofits, and more than $600,000 has been set aside for additional projects. It is expected that DU improvements accomplished at each of the 36 properties will remain constant for the life of the irrigation system retrofit, which is estimated to be 10 years. To ensure this is the case, for each property owner who implements a retrofit, RCWD will ask for access to their property for conducting visual inspections of the retrofitted irrigation systems twice during a 10-year monitoring period.

EWMP 4: Implement an Incentive Pricing Structure That Promotes One or More of the Following Goals:

a. More Efficient Water Use at the Farm Level Such That it Reduces Waste

In 2008, RCWD implemented a tiered-rate pricing structure for agricultural water use that promotes more efficient use of water at the farm level and reduces waste. Under this rate structure, each agricultural customer is charged a Tier 1 rate plus an energy/pumping charge for each hundred cubic feet of water (HCF) used up to an amount of water allocated to the customer for meeting the needs of their property. Water allocations provided to agricultural customers are based on:

- historical weather data (ETo) obtained from the California Irrigation Management Information System (CIMIS) network of weather stations
- crop water-use information obtained from agricultural and academic publications
- planted acreage obtained through GIS irrigated acreage measurements
- information about livestock reared for human consumption or market, and the associated irrigated grazing areas
- "incidental" domestic use are provided with additional water allocations for domestic indoor and landscape water use

Table 6.3-4 lists both historical and fiscal year 2006-2007 ETo data for two weather stations maintained by the CIMIS network. CIMIS Station 62 is located in RCWD's Santa Rosa Division and CIMIS Station 137 in the District's Rancho Division.

Table 6.3-4
CIMIS Station Evapotranspiration (ETo) Data
(inches)

Month	Station 62		Station 137	
	Historical	FY 2006/07	Historical	FY 2006/07
July	6.79	6.13	6.47	7.01
August	6.75	5.95	6.22	6.64
September	5.29	5.15	4.84	5.62

Month	Station 62		Station 137	
	Historical	FY 2006/07	Historical	FY 2006/07
October	4.18	3.66	3.66	3.59
November	3.41	3.15	2.36	2.11
December	2.87	2.99	1.83	1.77
January	2.74	2.88	1.83	2.11
February	2.71	2.65	2.20	2.68
March	3.79	4.68	3.42	5.01
April	4.79	4.11	4.84	4.81
May	5.48	5.53	5.61	6.05
June	6.19	6.22	6.26	7.07
Total	**54.99**	**53.10**	**49.54**	**54.47**

Table 6.3-5 lists a select sampling of crop coefficients compiled from academic and agricultural sources that were used to calculate water allocations as part of the tiered-rate structure.

Table 6.3-5
Select Monthly Crop Coefficients

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cool Season Turf	0.61	0.64	0.75	1.04	0.95	0.88	0.94	0.86	0.74	0.75	0.69	0.55
Peaches	0.55	0.55	0.65	0.65	0.90	0.90	0.90	0.90	0.90	0.90	0.65	0.55
Avocados	0.60	0.60	0.60	0.75	0.85	0.85	0.85	0.85	0.75	0.60	0.60	0.60
Grapefruit	0.65	0.65	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.65	0.65	0.65
Pasture	0.30	0.30	0.30	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.30
Flowers/Nursery	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Wine Grapes	0.30	0.30	0.45	0.45	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.30

Multiplying monthly ETo in Table 6.3-4 by a specific monthly crop coefficient in Table 6.3-5 generates a crop specific water use requirement for a particular month. An annual water use requirement, measured in inches, can be calculated by adding all monthly requirements.

Table 6.3-6 below illustrates the calculated annual crop water requirement in standard water measurement units, acre-feet and HCF (billing unit) per acre of irrigated crop.

Table 6.3-6
Annual Water Use Allocation by Crop

Crop	Rancho Division		Santa Rosa Division	
	Acre-feet per acre	HCF* per acre	Acre-feet per acre	HCF* per acre
Cool Season Turf	4.09	1782	4.07	1773
Peaches	3.95	1721	3.95	1721
Avocados	3.69	1607	3.7	1612
Grapefruit	3.39	1477	3.43	1494
Pasture	3.22	1403	3.19	1390
Cut Flowers/Nursery Crops	2.95	1285	3.01	1311
Wine Grapes	2.98	1298	2.97	1294

*HCF billing unit is "hundred cubic feet"

As growing conditions on agricultural properties change over the course of time (i.e., increased irrigated acreage), growers may request an increase to their Tier 1 water allocation. This process involves the verification of irrigated acreage through an on-site or GIS analysis.

For each HCF consumed in excess of a customer's water allocation, a Tier 2 rate (overuse rate) is charged in addition to the Tier 1 rate and energy/pumping charge. Table 6.3-7 illustrates RCWD's tiered-rate pricing structure for agricultural customers.

Table 6.3-7
RCWD Tiered Rate Structure for Agricultural Customers

Rancho Division (FY 2012/2013)			Santa Rosa Division (FY 2012/2013)		
Pump Zone	Ag Rate	Overuse Rate	Pump Zone	Ag Rate	Overuse Rate
1305	$1.0608	$1.6668	1305	$1.4240	$2.0300
1380	$1.0923	$1.6983	1434	$1.4717	$2.0777
1485	$1.1364	$1.7424	1440	$1.4740	$2.0800
1550	$1.1637	$1.7697	1500	$1.4962	$2.1022
1605	$1.1889	$1.7949	1670	$1.5591	$2.1651
1610	$1.1889	$1.7949	1990	$1.6775	$2.2835
1790	$1.2645	$1.8705	2160	$1.7404	$2.3464
1880	$1.3821	$1.9881	2260	$1.7774	$2.3834
2070	$1.3821	$1.9881	2550	$1.8847	$2.4907
2350	$1.4997	$2.1057	2850	$1.9957	$2.6017

EWMP 5: Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

To address long-term issues of imported water supply availability, system capacity constraints, and rising imported water costs, RCWD examined all possible supply-side and demand-side management opportunities through development of an Integrated Resources Plan (IRP). The purpose of the IRP was to identify strategies for meeting the needs of the District's customers in an economical and sustainable manner through development of a long-term water supply plan that can meet water demands until 2050. The IRP identifies a preferred strategy for meeting RCWD's long term-water supply needs through implementation of structural and non-structural supply options, as well as demand-side options, for enhancing distribution system flexibility and capacity.

To support IRP implementation, the District is in the process of updating its Facilities Master Plan (FMP). The purpose of the FMP is to ensure the District is successful in fulfilling its mission of delivering reliable, high quality water, wastewater and reclamation services to its customers and communities in a prudent and sustainable manner through improvement and maintenance of the District's water distribution facilities. As part of the FMP update, RCWD will develop its annual Capital Improvement Program, which will identify specific system upgrades and expansions targeted for completion for the upcoming year.

For example, construction of the Vail Lake Pipeline and Pump Station (VLPPS) was identified in the IRP as a strategy for increasing distribution system flexibility and capacity and for meeting the District's long term water supply development goals. Historically, RCWD has used Vail Lake to store local runoff, but is now in the process of finishing the last phase of the VLPPS, which will allow the District to bring untreated, imported water into the lake. This water can then be pumped from the lake using the newly constructed pump and pipeline facilities to the District's spreading fields for underground storage. The completion of the VLPPS is scheduled for early 2013.

Furthermore, a recent Indirect Potable Reuse (IPR) Study outlined the option of tertiary treatment and transportation of reclaimed water from RCWD's existing water reclamation facility to a theoretical Advanced Water Purification Facility for further treatment before being pumped to Vail Lake for storage. From Vail Lake, this advanced treated recycled water would be transported to the Upper VDC for recharge of the aquifer where it would be captured by wells and used by all RCWD water customers including agricultural ones. Further advanced feasibility work is underway, particularly in the area of brine management and disposal, to advance the IPR project alternative to a preliminary design stage and allow development of a project concept, environmental documentation to consider project alternatives, and necessary permitting, design and construction.

EWMP 6: Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

RCWD delivers water to all of its customers on an on-demand basis through a pressurized pipeline system. EWMP 6 is not relevant to RCWD's water operations since is not necessary for agricultural water users to order water, nor is it possible for RCWD to increase the flexibility water availability.

EWMP 7: Construct and operate supplier spill and tailwater recovery systems.

RCWD delivers water to all of its customers through a pressurized pipeline system that is not prone to the operational spills common to the canal delivery systems that serve many of the State's agricultural water users. Therefore, construction of tailwater recovery systems or supplier spill recovery systems such as full-flexibility lateral interceptors is not appropriate to the District's water delivery operation. The District is, however, considering coordinated efforts with Riverside County Flood Control for opportunities to capture storm water for groundwater recharge of high quality water for Basin Plan Management.

EWMP 8: Increase planned conjunctive use of surface water and groundwater within the supplier service area.

In addition to the extraction of the natural yield of the local basins, RCWD artificially recharges the Pauba Valley Basin with untreated imported water for enhanced groundwater production. RCWD has increased groundwater production over the past 10 years to meet increased water demands. Artificial recharge was 15,661 AF in 2005 and 12,187 AF in 2010, and is projected to increase to 23,000 AFY in 2015. RCWD's 2012 Upper VDC Conjunctive Use Optimization Study concluded that increasing artificial recharge of the local groundwater basin should be employed to reduce the costs of treated water and to enhance the sustainability of water supply during drought. Specific recommendations from the report include:

- Increasing recharge capacity while optimizing recovery rates through operation of new, strategically-located wells
- Managing recharge and recovery rates considering that leakage to deeper aquifer occurs at the advantage of creating long-term storage
- Managing the distribution pattern of recharge within the basin to avoid recharge and subsequent water loss to adjacent creeks
- Rehabilitating existing wells to enhance yields

RCWD also stores local runoff in Vail Lake, which was created in 1948 through construction of Vail Dam on Temecula Creek. After 1999, significant groundwater recharge from Vail Lake occurred in the following years: 2006, 2008, 2009, and 2010. The District is now in the process of completing the construction of the VLPPS, a conjunctive use project, which will allow the District to store additional untreated,

imported water in Vail Lake. The combination of this naturally occurring and imported water could be stored and pumped from the lake using the District's newly constructed pipeline and pump station to the Upper VDC for underground storage. The completion of the VLPPS is scheduled for early 2013.

EWMP 9: Automate canal control structures.

RCWD's water distribution system consists solely of pressurized pipelines and includes no canal delivery structures. Therefore, it is inappropriate for RCWD to implement EWMP 9.

EWMP 10: Facilitate or Promote Customer Pump Testing and Evaluation

Through Agency Agreements RCWD has with its customers, the District functions as the manager of the local aquifer. For this reason, construction or operation of private wells must be approved by the District. Customers who operate wells approved by the District are informed of the availability of free pump testing services available through Southern California Edison (SCE).

EWMP 11: Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

RCWD has designated a water conservation coordinator who will develop and implement the AWMP and prepare progress reports.

EWMP 12: Provide for the Availability of Water Management Services to Water Users. These services may include, but are not limited to, all of the following:

a. On-farm Irrigation and Drainage System Evaluations

RCWD makes available to all agricultural water users within its service area an Agricultural Irrigation Efficiency Program, which provides financial incentives to farmers for on farm irrigation system improvements. As part of program participation, farmers are provided with free irrigation system audits/evaluations, which include recommendations for implementation of applicable best management practices and water use efficiency improvements. The program also provides financial incentives to farmers who choose to implement the recommendations made as part of the irrigation system audits/evaluation process.

b. Normal Year and Real-Time Irrigation Scheduling and Crop Evapotranspiration Information

RCWD has provided a location for two CIMIS stations to be installed within the District's service area. Weather data produced by these two stations is available to local growers on DWR's CIMIS website. Additionally, RCWD is in the process of planning for the installation of 4 more weather stations within its service area by mid-

2013. These additional stations will be installed in strategically chosen areas within the service area that represent specific microclimates. Data produced by the stations will be made available to farmers on the District's website.

c. Surface water, groundwater, and drainage water quantity and quality data

RCWD holds Agricultural Water Users Meetings at least one time per year to provide farmers with information on water quantity and quality. Speakers from the Metropolitan provide information on RCWD's imported water supply, and the District's General Manager speaks about the local water supply. Additionally, information is provided by other RCWD staff regarding water quality considerations and assistance programs available to farmers.

With regard to water quality, total dissolved solids and chloride data are of specific importance to growers within RCWD's service area. This data is made available in a Consumer Confidence Report that is distributed to all District customers on an annual basis. Furthermore, growers have the ability to call the District's Water Quality Department to obtain water quality data specific to their area. The District also has plans to make more frequently collected water quality data available to growers on the District's website.

d. Agricultural Water Management Educational Programs and Materials for Farmers, Staff, and the Public

Educational outreach provided to farmers within RCWD's service area consists mainly of technical assistance that is offered through the District's Agricultural Irrigation Efficiency Program. The technical assistance involves irrigation system audits/site-evaluations that are provided free of charge to farmers. These audits/site-evaluations provide farmers with important information regarding the hydraulic efficiency of their irrigation systems and information regarding the overall efficiency of their irrigation water management practices. Following an audit/evaluation, farmers are provided with a variety of informational materials relating to efficient farming practices.

RCWD also facilitates occasional field days and demonstrations for farmers pertaining to new irrigation technologies and proper use of field testing equipment. A workshop pertaining to the use of wireless telemetry technologies for irrigation scheduling is planned for 2013.

EWMP 13: Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow for more flexible water deliveries and storage.

The District's two primary imported water sources included State Water Project and Colorado River water delivered by Metropolitan through EMWD and WMWD. Under existing 10-year purchase agreements with Metropolitan, WMWD and EMWD purchases totaled approximately 200,000 AF in 2010. During that year, RCWD purchased

approximately 46,000 AF through WMWD and EMWD. Metropolitan has evaluated the reliability of these imported supplies and concluded that these supplies can be met in the future under all hydrologic conditions.

The distribution systems of the agencies that directly supply RCWD with imported water are capable of delivering water to RCWD's system on an on-demand basis. Therefore, the District has not had to contend with issues pertaining to water delivery and storage flexibility. However, RCWD is engaged in a wide range of activities to ensure that the region continues to have a reliable supply of water in future years. Integrated Resources Planning, Integrated Regional Water Management Planning, Water Shortage Contingency Planning, and Demand Management Measures are all strategies employed by the District for sustaining adequate water supplies and managing local water demands.

EWMP 14: Evaluate and improve the efficiencies of the supplier's pumps.

RCWD Operations staff perform weekly look, listen, and feel checks for each of the District's well and booster pumps. These checks consist of pump vibration detection and flow observation activities. For any pump that shows signs of malfunction, a pump efficiency test is performed.

In addition to pump efficiency tests conducted as a result of the weekly checks, each of the District's well pumps and booster pumps is tested on an annual and bi-annual basis, respectively. Pumps found to be operating below industry standards for efficiency are repaired or replaced.

SECTION 7
COMPLETED AWMP CHECKLIST

Checklist is included on the following pages.

AGRICULTURAL WATER MANAGEMENT PLAN CHECKLIST

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
1			1.4	AWMP Required?	10820, 10608.12
	1 – Introduction	Section 2.1, pg. 2-4	1.4	At least 25,000 irrigated acres or	10853
	n/a		1.4	Less than 25,000 irrigated acres and available funding specified	10853
2	1 – Introduction	Section 1.2, pg. 1-2	1.4	Initial AWMP prepared and adopted by December 31, 2012?	10820(a)
3	1 – Introduction	Section 1.1, pg. 1-1	1.4	December 31, 2015 update?	10820(a)
4	1 – Introduction	Section 1.1, pg. 1-1	1.4	5-Year cycle update?	10820(a)
5	n/a		1.4	New agricultural water supplier after December 31, 2012 – AWMP prepared and adopted within 1 year?	10820(b)
6	n/a		1.5, 4.2	1999 AWC MOU: Report on EWMP implemented or scheduled for implementation included?	10827
7	n/a		1.5, 5	USBR Conservation Plan:	10828(a)
			1.5, 5.1	Adopted and submitted to USBR within the previous four years, AND	10828(a)(1)
			1.5, 5.1	The USBR has accepted the water conservation plan as adequate	10828(a)(2)
8	1 – Introduction	Section 1.2, pg. 1-2	1.4	UWMP or participation areawide, regional, watershed, or basinwide water management planning; does the plan meet requirements of SB x7-7 2.8? (use checklist)	10829
9	2 – RCWD Service Area	Sections 2.2-2.5 pgs. 2-7 through 2-22	3.1 A	Description of previous water management activities	10826(d)
	4 – Water Balance	Sections 4.1-4.10 pgs. 4-1 through 4-10			

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
10	1 – Introduction	Section 1.2, pgs.1-2 and1-3	3.1 B.1	Was each city or county within which supplier provides water supplies notified that the agricultural water supplier will be preparing or amending a plan?	10821(a)
11	1 – Introduction	Section 1.2, pg. 1-2	3.2 B.2	Was the proposed plan available for public inspection prior to plan adoption?	10841
12	1 – Introduction	Section 1.2, pg. 1-2	3.1 B.2	Publically-owned supplier: Prior to hearing, was the notice of time and place of hearing published within the jurisdiction of the publicly owned agricultural water supplier in accordance with Government Code 6066?	10841
		Section 1.2, pg. 1-2	3.1 B.2	14 days notification for public hearing?	GC 6066
	1 – Introduction	Section 1.2, pgs. 1-2 and Appendix B	3.1 B.2	Two publications in newspaper within those 14 days	10631(b)
	1 – Introduction	Section 1.2, pgs. 1-2 and Appendix B	3.1 B.2	At least 5 days between publications? (not including publication date)	10631(b)(1)
13	n/a		3.1 B.2	Privately-owned supplier: was equivalent notice within its service area and reasonably equivalent opportunity that would otherwise be afforded through a public hearing process provided?	10631(b)(2)
14	1 – Introduction	Section 1.2, pg. 1-2	3.1 C.1	After hearing/equivalent notice, was the plan adopted as prepared or as modified during or after the hearing?	10631(b)(2)

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
15	1 – Introduction	Section 1.2, pg. 1-2	3.1 C.2	Was a copy of the AWMP, amendments, or changes, submitted to the entities below, no later than 30 days after the adoption?	10631(b)(2)
			3.1 C.2	The department	10631(b)(2)
			3.1 C.2	Any city, county, or city and county within which the agricultural water supplier provides water supplies.	10631(b)(3)
			3.1 C.2	Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.	10631(b)(4)
			3.1 C.2	Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.	10631(c)(1)
			3.1 C.2	Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.	10631(c)(2)
			3.1 C.2	The California State Library.	10631(d)
			3.1 C.2	Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.	10631(e)(1)
16			3.1 C.3	Adopted AWMP availability	10631(f)(1)
	1 – Introduction	Section 1.2, pg. 1-2	3.1 C.3	Was the AWMP available for public review on the agricultural water supplier's Internet Web site within 30 days of adoption?	10631(f)(3)
	n/a		3.1 C.3	If no Internet Web site, was an electronic copy of the AWMP submitted to DWR within 30 days of adoption?	10631(f)(4)

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
17	6 – Efficient Water Management Practices	Section 6.3, pgs. 6-3 through 6-18	3.1 D.1	Implement the AWMP in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.	10631(g)
18	2 – RCWD Service Area	Sections 2.1-2.5, pgs. 2-1 through 2-22	3.2	Description of the agricultural water supplier and service area including:	10631(h)
		Section 2.1, pg. 2-1	3.2 A.1	Size of the service area.	10631(i)
		Section 2.1, pg. 2-2	3.2 A.2	Location of the service area and its water management facilities.	10631(j)
		Section 2.1, pgs. 2-5 through 2-6	3.2 A.3	Terrain and soils.	10631(k)
		Section 2.1, pg. 2-6	3.2 A.4	Climate.	10631.1(a)
		Section 2.2, pg. 2-7	3.2 B.1	Operating rules and regulations.	10632(a)
		Section 2.3, pg. 2-7	3.2 B.2	Water delivery measurements and calculations.	10632(b)
		Section 2.4, pgs. 2-7 through 2-8	3.2 B.3	Water rate schedules and billing.	10632(c)
		Section 2.5, pgs. 2-8 through 2-22	3.2 B.4	Water shortage allocation policies.	10632(d)
	4 – Water Balance	Sections 4.3-4.8, pgs. 4-3 through 4-7	3.3	Water use within the service area, including all of the following:	10632(e)
		Section 4.3, pgs. 4-3 through 4-4	3.3 A	Agricultural.	10632(f)
		Section 4.4, pg. 4-4	3.3 B	Environmental.	10632(g)
		Section 4.5, pgs. 4-4 through 4-5	3.3 C	Recreational.	10632(h)
		Section 4.6, pg. 4-5	3.3 D	Municipal and industrial.	10632(i)
		Section 4.7, pg. 4-5	3.3 E	Groundwater recharge.	10633
		Section 4.8, pgs. 4-5 through 4-7	3.3 F	Transfers and exchanges.	10633(a)
	n/a		3.3 G	Other water uses.	10633(b)

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
19			3.4 A	Description of the quantity of agricultural water supplier's supplies as:	10633(c)
	3 – Inventory of Water Supplies	Sections 3.1.1, 3.1.2, 3.1.3, & 3.2.1, pgs. 3-1 through 3-5, & 3-8 through 3-10	3.4 A.1	Surface water supply.	10633(d)
		Sections 3.1.4 and 3.2.2, pgs. 3-5 & 3-10 through 3-17	3.4 A.2	Groundwater supply.	10633(e)
		Sections 3.1.5, 3.2.3 & 3.2.4 pgs. 3-7, & 3-17 through 3-28	3.4 A.3	Other water supplies.	10633(f)
	4 – Water Balance	Section 4.9, pgs. 4-7 through 4-8	3.4 A.4	Drainage from the water supplier's service area.	10633(g)
20			3.4 B	Description of the quality of agricultural waters suppliers supplies as:	10634
	3 – Inventory of Water Supplies	Section 3.3.2, pgs. 3-38 through3-47	3.4 B.1	Surface water supply.	10635(a)
		Section 3.3.3, pgs. 3-48 through3-49	3.4 B.2	Groundwater supply.	10635(b)
		Section 3.3.4, pg. 3-49	3.4 B.3	Other water supplies.	10642
		Section 3.3.1, pg. 3-38	3.4 C	Source water quality monitoring practices.	10642
	4 – Water Balance	Section 4.9, pgs. 4-7 through 4-8	3.4 B.4	Drainage from the water supplier's service area.	10642

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
21	4 – Water Balance	Section 4.10, pgs. 4-8 through 4-10	3.5	Description of water accounting, including all of the following:	10643
		Section 4.10.1, pg. 4-8	3.5 A	Quantifying the water supplier's water supplies.	10644(a)
		Section 4.10.2, pgs. 4-9 through 4-10	3.5 B	Tabulating water uses.	10645
		Sections 4.10 & 4.12, pgs. 4-9 & 4-10, & 4-27 through 4-33	3.5 C	Overall water budget.	10826(b)(7)(C)
22	4 – Water Balance	Section 4.11, pgs. 4-11 through 4-33	3.5 D	Description of water supply reliability.	10826(b)(8)
23	5 – Climate Change	Section 5, pgs. 5-1 through 5-4	3.6	Analysis of climate change effect on future water supplies analysis	10826(c)
24	6 – Efficient Water Management Practice	Sections 6.1-6.3, pgs. 6-1 through 6-18	3.7	Water use efficiency information required pursuant to Section 10608.48.	10826(e)
25	6 – Efficient Water Management Practice	Section 6.3, pgs. 6-3 through 6-18	3.7 A	Implement efficient water management practices (EWMPs)	10608.48(a)
26	6 – Efficient Water Management Practices	Section 6.3, pgs. 6-6 through 6-7	3.7 A.1	Implement Critical EWMP: Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).	10608.48(b)
27	6 – Efficient Water Management Practices	Section 6.3, pg. 6-7	3.7 A.1	Implement Critical EWMP: Adopt a pricing structure for water customers based at least in part on quantity delivered.	10608.48(b)
28	6 – Efficient Water Management Practices	Section 6.3, pgs. 6-8 through 6-18	3.7 A.2	Implement additional locally cost-effective and technically feasible EWMPs	10608.48(c)
29	n/a		3.7 B	If applicable, document that EWMPs are not locally cost-effective or technically feasible	10608.48(d)

No.	AWMP Chapter [b]	AWMP Location	Guidebook Section Location	AWMP Requirement Description [a]	Water Code Section (or other, as identified)
30	6 – Efficient Water Management Practices	Section 6.3, pgs. 6-3 through 6-5	3.7 A	Include a report on which EWMPs have been implemented and planned to be implemented	10608.48(d)
31	6 – Efficient Water Management Practices	Section 6.3, pgs. 6-3 through 6-5	3.7 A	Include (in the report) an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future.	10608.48(d)
32	n/a		5	USBR water management/conservation plan may meet requirements for EWMPs	10608.48(f)
33	n/a		6 A	Lack of legal access certification (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(2)(A)
34	n/a		6 B	Lack of technical feasibility (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(1)(B), §597.3(b)(2)(B)
35	n/a		6 A, 6 B	Delivery apportioning methodology (if water measuring not at farm gate or delivery point)	CCR §597.3(b)(2)(C)
36	n/a		6 C	Description of water measurement BPP	CCR §597.4(e)(2)
37	n/a		6 D	Conversion to measurement to volume	CCR §597.4(e)(3)
38	n/a		6 E	Existing water measurement device corrective action plan? (if applicable, including schedule, budget and finance plan)	CCR §597.4(e)(4)

[a] The AWMP Requirement descriptions are general summaries of what is provided in the legislation.

[b] The Chapter classification is provided for topical clarification only.

APPENDICES

Appendix A	Agricultural Water Management Planning Act (Section I, Part 2.8, Division 6 of the Water Code)
Appendix B	Notice of Public Hearing and Resolution for Plan Adoption
Appendix C	References
Appendix D	Rancho California Water District Rules and Regulations Governing Water System Facilities and Services, Part III, Chapter 1, Section 1
Appendix E	RCWD Water Shortage Contingency Plan
Appendix F	RCWD Water Conservation Policy

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APPENDIX A
AGRICULTURAL WATER MANAGEMENT PLANNING ACT OF 2009

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CALIFORNIA WATER CODE DIVISION 6
PART 2.8 AGRICULTURAL WATER MANAGEMENT PLANNING

Chapter 1. General Declarations and Policy

10800. This part shall be known and may be cited as the Agricultural Water Management Planning Act.

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) Urban water districts are required to adopt water management plans.

(d) The conservation of agricultural water supplies is of great statewide concern.

(e) There is a great amount of reuse of delivered water, both inside and outside the water service areas.

(f) Significant noncrop beneficial uses are associated with agricultural water use, including streamflows and wildlife habitat.

(g) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.

(h) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.

(i) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.

(j) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.

10802. The Legislature finds and declares that all of the following are the policies of the state:

(a) The conservation of water shall be pursued actively to protect both the people of the state and the state's water resources.

(b) The conservation of agricultural water supplies shall be an important criterion in public decisions with regard to water.

(c) Agricultural water suppliers shall be required to prepare water management plans to achieve conservation of water.

Chapter 2. Definitions

10810. Unless the context otherwise requires, the definitions set forth in this chapter govern the construction of this part.

10811. "Agricultural water management plan" or "plan" means an agricultural water management plan prepared pursuant to this part.

10812. "Agricultural water supplier" has the same meaning as defined in Section 10608.12.

10813. "Customer" means a purchaser of water from a water supplier who uses water for agricultural purposes.

10814. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of that entity.

10815. "Public agency" means any city, county, city and county, special district, or other public entity.

10816. "Urban water supplier" has the same meaning as set forth in Section 10617.

10817. "Water conservation" means the efficient management of water resources for beneficial uses preventing waste, or accomplishing additional benefits with the same amount of water.

Chapter 3. Agricultural Water Management Plans

Article 1. General Provisions

10820.

(a) An agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015, and on or before December 31 every five years thereafter.

(b) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(c) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

10825.

(a) An agricultural water supplier required to prepare a plan pursuant to this part shall notify each city or county within which the supplier provides water supplies that the agricultural water supplier will be preparing the plan or reviewing the plan and considering amendments or changes to the plan. The agricultural water supplier may consult with, and obtain comments from, each city or county that receives notice pursuant to this subdivision.

(b) The amendments to, or changes in, the plan shall be adopted and submitted in the manner set forth in Article 3 (commencing with Section 10840).

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities. (3)

Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.

(6) Water delivery measurements or calculations. (7)

Water rate schedules and billing.

(8) Water shortage allocation policies.

(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:

(1) Surface water supply. (2)

Groundwater supply. (3)

Other water supplies.

(4) Source water quality monitoring practices.

(5) Water uses within the agricultural water supplier's service area, including all of the following:

(A) Agricultural.

(B) Environmental.

(C) Recreational.

(D) Municipal and industrial. (E)

Groundwater recharge. (F)

Transfers and exchanges. (G)

Other water uses.

(6) Drainage from the water supplier's service area.

(7) Water accounting, including all of the following:

(A) Quantifying the water supplier's water supplies.

(B) Tabulating water uses.

(C) Overall water budget.

(8) Water supply reliability.

(c) Include an analysis, based on available information, of the effect of climate change on future water supplies.

(d) Describe previous water management activities.

(e) Include in the plan the water use efficiency information required pursuant to Section 10608.48.

10827. Agricultural water suppliers that are members of the Agricultural Water Management Council, and that submit water management plans to that council in accordance with the "Memorandum of Understanding Regarding Efficient Water Management Practices By Agricultural Water Suppliers In California," dated January 1, 1999, may submit the water management plans identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10826.

10828.

(a) Agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, may submit those water conservation plans to satisfy the requirements of Section 10826, if both of the following apply:

(1) The agricultural water supplier has adopted and submitted the water conservation plan to the United States Bureau of Reclamation within the previous four years.

(2) The United States Bureau of Reclamation has accepted the water conservation plan as adequate.

(b) This part does not require agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, to prepare and adopt water conservation plans according to a schedule that is different from that required by the United States Bureau of Reclamation.

10829. An agricultural water supplier may satisfy the requirements of this part by adopting an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) or by participation in areawide, regional, watershed, or basinwide water management planning if those plans meet or exceed the requirements of this part.

Article 3. Adoption and Implementation of Plans

10840. Every agricultural water supplier shall prepare its plan pursuant to Article 2 (commencing with Section 10825).

10841. Prior to adopting a plan, the agricultural water supplier shall make the proposed plan available for public inspection, and shall hold a public hearing on the plan. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned agricultural water supplier pursuant to Section 6066 of the Government Code. A privately owned agricultural water supplier shall provide an equivalent notice within its service area and shall provide a reasonably equivalent opportunity that would otherwise be afforded through a public hearing process for interested parties to provide input on the plan. After the hearing, the plan shall be adopted as prepared or as modified during or after the hearing.

10842. An agricultural water supplier shall implement the plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.

10843.

(a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after the adoption of the plan. Copies of amendments or changes to the plans shall be submitted to the entities identified in subdivision (b) within 30 days after the adoption of the amendments or changes.

(b) An agricultural water supplier shall submit a copy of its plan and amendments or changes to the plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.

(5) Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.

(6) The California State Library.

(7) Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.

10844.

(a) Not later than 30 days after the date of adopting its plan, the agricultural water supplier shall make the plan available for public review on the agricultural water supplier's Internet Web site.

(b) An agricultural water supplier that does not have an Internet Web site shall submit to the department, not later than 30 days after the date of adopting its plan, a copy of the adopted plan in an electronic format. The department shall make the plan available for public review on the department's Internet Web site.

10845.

(a) The department shall prepare and submit to the Legislature, on or before December 31, 2013, and thereafter in the years ending in six and years ending in one, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

Chapter 4. Miscellaneous Provisions

10850.

(a) Any action or proceeding to attack, review, set aside, void, or annul the acts or decisions of an agricultural water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(1) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(2) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 120 days after submitting the plan or amendments to the plan to entities in accordance with Section 10844 or the taking of that action.

(b) In an action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an agricultural water supplier, on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the agricultural water supplier has not proceeded in a manner required by law, or if the action by the agricultural water supplier is not supported by substantial evidence.

10851. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part. This part does not exempt projects for implementation of the plan or for expanded or additional water supplies from the California Environmental Quality Act.

10852. An agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

10853. No agricultural water supplier that provides water to less than 25,000 irrigated acres, excluding recycled water, shall be required to implement the requirements of this part or Part 2.55 (commencing with Section 10608) unless sufficient funding has specifically been provided to that water supplier for these purposes.

SEC. 5. This act shall take effect only if Senate Bill 1 and Senate Bill 6 of the 2009–10 Seventh Extraordinary Session of the Legislature are enacted and become effective.

APPENDIX B
NOTICE OF PUBLIC HEARING AND RESOLUTION FOR PLAN ADOPTION

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(951) 684-1200
(951) 368-9006 Fax

Account Information

Phone #:	(951) 296-6900
Name:	RANCHO CALIFORNIA WATE
Address:	P.O. BOX 9017 , TEMECULA, CA 92590 USA
Account #	100141364
Client:	
Placed By:	Ana Belland
Fax #:	(951) 296-6860

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Bill Size:	
Amount Due:	**$327.60**

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PUBLIC NOTICE FOR ADOPTION OF THE RANCHO CALIFORNIA WATER DISTRICT 2012 AGRICULTURAL WATER MANAGEMENT PLAN

Notice is hereby given that a public hearing will be conducted by the Board of Directors of the Rancho California Water District on Thursday, December 13, 2012, at or after 8:30 a.m. at the District's Headquarters located at 42135 Winchester Road, Temecula, California 92590.

In accordance with the Water Conservation Act of 2009 (Senate Bill x7-7); California Water Code §10820 et seq.) the Rancho California Water District has prepared a 2012 Agricultural Water Management Plan (AWMP) Update. The purpose of the public hearing is to receive public comment prior to formal adoption of the District's 2012 AWMP Update. Copies of the draft 2012 AWMP are available for public review at the District's Headquarters located at 42135 Winchester Road, Temecula, California 92590, during regular business hours. The draft 2012 AWMP is also available at the District's website - www.ranchowater.com.

If you cannot attend, you are encouraged to submit written comments prior to the public hearing. Written comments may be mailed to: Denise Landstedt, Senior Water Resources Planner, Planning Department, Rancho California Water District, 42135 Winchester Road, Temecula, California 92590, or e-mailed to landstedtd@ranchowater.com. Questions regarding the draft 2012 AWMP should also be directed to Denise Landstedt at landstedtd@ranchowater.com or (951) 296-6916.

DATED: November 13, 2012

Kelli E. Garcia, Secretary of the Board of Directors of the Rancho California Water District 11/20, 27

U-T San Diego

Order Confirmation

Account Number: 1214178
Customer: RANCHO CALIF WATER DISTRICT
42135 WINCHESTER RD
TEMECULA, CA 92590

Telephone: (909) 676-4101
Fax:
EMail:

Ad Number: 0010687190
PO Number: 2012 AG WATER MGMT PLAN
Date Ordered: 11/13/2012
Orderer: ANA BELLAND
Order Status: Live
Queue: Ready
Colors: <NONE>
Prod Colors:
Production Method: AdBooker
Ad Size: 3.22 x 3.18
Columns: 2.00 Inches: 3.18

Total Amount: $192.56
Payment Method:
Payment Amount: $0.00
Amount Due: $192.56

Sales Rep: TAMMI SWENSON
Telephone: (951) 676-4315
EMail: TAMMI.SWENSON@UTSANDIEGO.COM

Product	Zone	Placement	Position	Start Date	End Date	Insertions
NCTimes	Full Run	NCT Legals	NCT Legals	11/20/2012	11/27/2012	2
NCTimes Mobile	Full Run	NCT Legals	NCT Legals	11/20/2012	11/27/2012	2
The Californian	Full Run	NCT Legals	NCT Legals	11/20/2012	11/27/2012	2

Ad Content

PUBLIC NOTICE FOR ADOPTION OF THE RANCHO CALIFORNIA WATER DISTRICT 2012 AGRICULTURAL WATER MANAGEMENT PLAN Notice is hereby given that a public hearing will be conducted by the Board of Directors of the Rancho California Water District on Thursday, Decoember 13, 2012, at or after 8:30 a.m. at the District's Headquarters located at 42135 Winchester Road, Temecula, California 92590. In accordance with the Water Conservation Act of 2009 (Senate Bill x7-7; California Water Code 10820 et seq.), the Rancho California Water District has prepared a 2012 Agricultural Water Management Plan (AWMP) Update. The purpose of the public hearing is to receive public comment prior to formal adoption of the District's 2012 AWMP Update. Copies of the draft 2012 AWMP are available for public review at the District's Headquarters located at 42135 Winchester Road, Temecula, California 92590, during regular business hours. The draft 2012 AWMP is also available at the District's website - www.ranchowater.com. If you cannot attend, you are encouraged to submit written comments prior to the public hearing. Written comments may be mailed to: Denise Landstedt, Senior Water Resources Planner, Planning Department, Rancho California Water District, 42135 Winchester Road, Temecula, California 92590, or emailed to landstedtd@ranchowater.com. Questions regarding the draft 2012 AWMP should also be directed to Denise Landstedt at landstedtd@ranchowater.com or (951) 296-6916. DATED: November 13, 2012 Kelli E. Garcia, Secretary of the Board of Directors of the Rancho California Water District PUB: 11/20, 11/27/2012

PUBLIC NOTICE FOR ADOPTION OF THE RANCHO CALIFORNIA WATER DISTRICT 2012 AGRICULTURAL WATER MANAGEMENT PLAN

Notice is hereby given that a public hearing will be conducted by

Printed: 11/13/2012 3:02 pm

U-T San Diego

Order Confirmation

Ad Order: 0010687190

Notice is hereby given that a public hearing will be conducted by the Board of Directors of the Rancho California Water District on Thursday, December 13, 2012, at or after 8:30 a.m. at the District's Headquarters located at 42135 Winchester Road, Temecula, California 92590.

In accordance with the Water Conservation Act of 2009 (Senate Bill x7-7; California Water Code 10820 et seq.), the Rancho California Water District has prepared a 2012 Agricultural Water Management Plan (AWMP) Update. The purpose of the public hearing is to receive public comment prior to formal adoption of the District's 2012 AWMP Update. Copies of the draft 2012 AWMP are available for public review at the District's Headquarters located at 42135 Winchester Road, Temecula, California 92590, during regular business hours. The draft 2012 AWMP is also available at the District's website - www.ranchowater.com.

If you cannot attend, you are encouraged to submit written comments prior to the public hearing. Written comments may be mailed to: Denise Landstedt, Senior Water Resources Planner, Planning Department, Rancho California Water District, 42135 Winchester Road, Temecula, California 92590, or emailed to landstedtd@ranchowater.com. Questions regarding the draft 2012 AWMP should also be directed to Denise Landstedt at landstedtd@ranchowater.com or (951) 296-6916.

DATED: November 13, 2012
Kelli E. Garcia, Secretary of the
Board of Directors of the
Rancho California Water District PUB: 11/20, 11/27/2012

Printed: 11/13/2012 3:02 pm

RESOLUTION NO. 2012-12-2

RESOLUTION OF THE BOARD OF DIRECTORS OF THE RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ADOPTING THE RANCHO CALIFORNIA WATER DISTRICT 2012 AGRICULTURAL WATER MANAGEMENT PLAN

WHEREAS, the California Legislature enacted Senate Bill x7-7 during the 2009-2010 Extraordinary Session of the California Legislature, which includes Water Code Section 10800 et. Seq., known as the Agricultural Water Management Planning Act of 2009 (Act); and

WHEREAS, the Rancho California Water District (the "District") has prepared a 2012 Agricultural Water Management Plan pursuant to the requirements of the Act; and

WHEREAS, the purpose of the 2012 Agricultural Water Management Plan is to ensure the appropriate level of reliability in water service sufficient to meet the needs of the District's agricultural water customers during normal, single dry and multiple dry years; and

WHEREAS, the District continues to develop and implement agricultural efficient water management practices and alternative water supplies that contribute toward the conservation and efficient use of water resources to ensure adequate water supplies now and in the future; and

WHEREAS, the 2012 Agricultural Water Management Plan will be periodically reviewed and updated, if determined appropriate, no less than every five years in the years ending in zero and five, beginning in 2015, to reflect changes in water supply trends and conservation policies and practices within the water service area of the District; and

WHEREAS, a public hearing was properly noticed and was held by the Board of Directors of the District on December 13, 2012 to receive public comments regarding the 2012 Agricultural Water Management Plan.

NOW THEREFORE, it is hereby resolved by the Board of Directors of the Rancho California Water District as follows:

Section 1. The Board of Directors of the Rancho California Water District approves and adopts the 2012 Agricultural Water Management Plan for the Rancho California Water District.

Section 2. The General Manager is hereby authorized and directed to file a copy of the 2012 Agricultural Water Management Plan with the California Department of Water Resources within 30 days after the date of this resolution.

Section 3. The General Manager is hereby authorized and directed to implement the programs described in the 2012 Agricultural Water Management Plan.

ADOPTED, SIGNED, AND APPROVED this 13th day of December 2012.

John E. Hoagland, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Kelli E. Garcia, Secretary of the
Board of Directors of the
Rancho California Water District

[Resolution No. 2012-12-2]

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APPENDIX C
REFERENCES

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Rancho California Water District
2012 Agricultural Water Management Plan

REFERENCES

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Rancho California Water District Engineering Department staff

Rancho California Water District Finance Department staff

Rancho California Water District Operations Department staff

Rancho California Water District Planning Department staff

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APPENDIX D
RANCHO CALIFORNIA WATER DISTRICT RULES AND REGULATIONS GOVERNING WATER SYSTEM FACILITIES AND SERVICES, PART IV, CHAPTER 1

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Rancho California Water District Administrative Code
Rules and Regulations Governing Water System Facilities and Service
Part III, Chapter 1, Section 1

Meter Testing, Repair, and Replacement

Meters will be thoroughly inspected for excessive wear during testing and rebuilt or replaced, as required. In addition, when there is uncertainty regarding the accuracy of any size meter within the District, the meter will be tested by staff. Meter sizes ¾" through 2" will be replaced, while meters sized 3" and above will either be rebuilt or replaced if a problem is found.

A. Initial Test. Prior to installation, each meter will be tested by the manufacturer or by the District.

B. Small Meter Testing and Repair.

Testing - Meters 2" and Smaller: Meters will only be tested at the discretion of the District if the meter is suspected of being inaccurate.

Repair: During the testing process, all meters will be thoroughly inspected for excessive wear; if excessive wear is found, the meter will be replaced. In addition, all inaccurate meters will be replaced.

C. Large Meter Testing and Repair.

Testing - 3" to 4" Meters: Meters with usage over 10,000 HCF per year will be tested by the District annually; meters with usage of less than 10,000 HCF and greater than 5,000 HCF per year will be tested by the District biennially; and meters with usage of less than 5,000 HCF per year will be tested by the District every five (5) years. In addition, if any meter register is suspected of being inaccurate, the meter will be tested by the District.

Testing - Meters Larger Than 4": All active meters larger than 4" will be tested by the District on an annual basis. In addition, if any meter register is suspected of being inaccurate, the meter will be tested by the District.

Repair: During the testing process, all meters will be thoroughly inspected for excessive wear; if excessive wear is found, the meter will be rebuilt or replaced, at the discretion of the District. For meters sized 3" and above, inaccurate meters will be rebuilt or replaced, at the discretion of the District.

D. Meter Testing At Customer's Request. A customer may, by giving not less than one week's notice, request the District to test the meter serving the customer's premises. The District will require the customer to deposit the current fee to cover cost of the test, as indicated in the Customer Guide to Rates & Charges.

The deposit will be returned if the meter is found to register more than a 3 percent error in favor of the District. The customer will be notified not less than two days in advance of the time and place of the test. A customer shall have the right to be present or to be represented by a designated person. A written report, giving the results of the test will be given to the customer within fourteen (14) days after

completion of the test. When, upon testing, a meter is found to be registering more than 3 percent fast under manufacturer's design-rated capacity, the District will refund to the customer the full amount of the overcharge based on corrected meter readings for the period not exceeding six (6) months that the meter was in use by the customer.

E. Meter Replacement Criteria.

¾" through 2" Meters: All meters will be replaced every 15 years, or when consumption exceeds 100,000 HCF, or when not testing within District specifications.

3" Meters and Larger: All meters will be evaluated during the testing process and repaired or replaced, at the discretion of the District.

APPENDIX E
RCWD WATER SHORTAGE CONTINGENCY PLAN

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WATER SHORTAGE CONTINGENCY PLAN

Rancho California Water District

General Manager
Matthew Stone

Director of Planning
Perry Louck

Senior Water Resources Planner
William Stephens

Adopted: July 10, 2008
Revised: June 2009
Revised: May 2011

Rancho California Water District
42135 Winchester Road
Temecula, CA 92590 (951) 296-6900

Table of Contents

RCWD Water Shortage Contingency Plan

Section 1: Purpose and Principles of Plan

1.1 Water Code 10632

The Rancho California Water District (District) has developed a Water Shortage Contingency Plan (WSC Plan) in accordance with California Water Code 10632. The Water Code 10632 states that water agencies must develop a supply shortage contingency plan in the event of drought, water supply reductions, failure of water distribution system, or other emergencies. The contingency plan must demonstrate the ability of an agency to meet demands under a supply shortage of up to 50 percent. Emphasis is placed on protection of public health, sanitation, fire protection, and general public welfare.

As such, this WSC Plan adopts regulations and restrictions on outdoor water use only, including domestic, commercial/institutional, parks and golf courses, and agriculture. Recycled water users may be exempt from some restrictions in this WSC Plan.

1.2 MWD Water Surplus and Drought Management Plan

The District currently receives approximately 65 percent of its total water supply (treated and untreated) from the Metropolitan Water District of Southern California (MWD). This imported water is delivered through water connections of the Eastern Municipal Water District (EMWD) and Western Municipal Water District of Riverside County (WMWD). Both EMWD and WMWD are member agencies of MWD, and, therefore, the District is subject to MWD's plans and policies during a water shortage.

To deal with periods of water surplus and drought, MWD developed its Water Surplus and Drought Management Plan (WSDM Plan). MWD strategically manages water in times of surplus to ensure there is an adequate supply during a shortage. The WSDM Plan defines surplus and shortage conditions as follows:

> Surplus:
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> Supplies are sufficient to allow MWD to meet full service demands, make deliveries to all interruptible programs (replenishment, long-term seasonal storage, and agricultural deliveries), and deliver water to regional and local facilities for storage.
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> Shortage:
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> Supplies are sufficient to allow MWD to meet full service demands and make partial or full deliveries to interruptible programs, sometimes using stored water and voluntary water transfers.

Severe Shortage:

Supplies are insufficient to meet full service demands and MWD is required to make withdrawals from storage, call on its water transfers, and possibly call for extraordinary drought conservation and reduce deliveries under the Interim Agriculture Water Program (IAWP).

Extreme Shortage:

Supplies are insufficient to meet full service demands and MWD is required to allocate its available imported supplies to its member agencies.

The following actions represent MWD's plan for dealing with supply shortages in the general order they would be implemented:

1. Draw on stored water in the Diamond Valley Lake
2. Draw on out-of-region groundwater storage
3. Reduce/suspend discounted long-term groundwater and surface storage replenishment deliveries
4. Draw on contractual groundwater storage programs within the region
5. Draw on State Water Project terminus reservoir storage
6. Call for extraordinary drought conservation and public education
7. Reduce agricultural deliveries in accordance with IAWP
8. Call on water transfer options contracts and purchase transfers on the spot market
9. Allocate MWD's firm imported supplies to its member agencies

1.3 MWD Interim Agricultural Water Program (IAWP)

RCWD provides water service to approximately 1,700 Agriculture and Agriculture/Domestic accounts. In 2003-2004, the District delivered a high volume of approximately 29,000 acre-feet (AF) of IAWP water to these customers.

The IAWP offers surplus water to Southern California's agricultural industry at discounted water rates. MWD's Administrative Code generally defines agriculture under the IAWP as water used for growing or raising agricultural, horticultural or floricultural products for the purposes of commerce, trade or industry, or for use by educational or correctional institutions, on parcels where greater than one acre is used exclusively for the aforementioned purposes. It applies to both the growing of crops and raising of livestock and fowl for human consumption or market. These agricultural water supplies will be interrupted as part of MWD's shortage actions. MWD will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users.

According to MWD's IAWP Reduction Guidelines, MWD has the right to discontinue surplus water service in whole or in part with one year's written notice.

After an agency participant is given a notice of discontinuation, MWD's General Manager may reduce IAWP deliveries up to 30 percent prior to any urban water allocation action under the WSDM Plan.

The timing of potential reductions in IAWP deliveries, as a dry year supply measure is important to note as Colorado River and State Water Project (SWP) supplies are determined annually on a calendar year basis. The initial SWP supply allocation is estimated in December; however, the supply remains uncertain and may not be finalized until May or June. A lead-time between the time that Metropolitan issues a notice of a reduction in agricultural deliveries under the IAWP and when the reductions begin is necessary for the member agencies to communicate and implement plans with their retail agencies and/or IAWP participants. As a result, Metropolitan's notification protocol includes a 60-day period between the time when Metropolitan notifies agencies of the reduction and when the reduction actually occurs.

Since a call for reduction in IAWP deliveries would typically occur after an extended dry period, monthly IAWP usage targets for the upcoming reduction period should be based on IAWP water usage in a prior dry year (Baseline). This Baseline will remain in place for the period in which the IAWP reduction is in effect, and for droughts continuing into successive years.

Metropolitan will monitor reduction performance on a monthly basis, but assess penalties at six-month intervals. At the end of each six-month period, Metropolitan will assess financial penalties for IAWP water over-use (debits) or issue credits for IAWP water under-use. Member Agencies demonstrating IAWP use below their usage targets during the first six-months (under-use) of the reduction period will be able to carry forward the under-use amount as a credit into the second six-month period. Should the agency incur a debit in the second six month period, its over-use would be reduced by credits carried forward from the first six-months. However, should the IAWP reductions continue beyond one year, credits from the first, and second six-month periods would not carry forward into a successive year. Credits would revert to zero at the end of each twelve-month period.

Actual IAWP water consumption will be measured every six months. If an agency used less water than it was allotted it receives a credit that carries over into the next six month period. If the agency used more water than it was allotted via the established baseline then it is assigned a debit. If an agency uses more water than it is allotted they have to pay MWD's penalty rate for the amount of water over the established baseline.

1.4 Principles of District's Water Shortage Contingency Plan

The overall principle of the District's WSC Plan is to reliably meet water demands during shortages caused by droughts, supply reductions, and emergency conditions. The WSC Plan recognizes the following priorities for

potable water:

1. Public safety, health and welfare
2. Economic sustainability
3. Quality of life for the District's customers

The potable water use regulated and/or prohibited under this WSC Plan is considered to be non-essential use. Continued use of such water during times of water shortage or other emergency supply conditions are deemed to constitute a waste of water and will be subject to appropriate penalties as described in Section 4 of this WSC Plan.

In the event that the reduction in water sales as a result of implementation of the WSC Plan negatively impacts the coverage of the District's fixed costs obligations, the District will utilize its drought reserves (see Section 5 of this WSC Plan).

1.5 Public Notice and Coordination with Other Water Agencies

The District will periodically provide the public with information about the WSC Plan, including its implementation. Such information will include, but not be limited to, stages of action, restrictions on water use, water-saving tips, and potential penalties for noncompliance of WSC Plan. In addition, the District will coordinate its implementation of its WSC Plan with the Metropolitan Water District of Southern California and the Eastern and Western Municipal Water Districts. This will be necessary to ensure efficient regional water management during periods of water supply shortage.

Example Local Media Outlets:

KZSW TV Channel 27	Television
The Press Enterprise	Newspaper & Online
The Californian	Newspaper & Online
The Business Press	Newspaper
Valley News	Newspaper

Section 2: Authorization and Application of WSC Plan

2.1 Authorization of WSC Plan

The water shortage contingency measures of this WSC Plan shall apply to all persons, customers, and property using water provided by the District. The terms "persons" and "customers" used in this WSC Plan include individuals, home and property owners, corporations, businesses, agencies, associations, and all other legal entities.

A declaration by the Board or the General Manager of a water shortage condition as outlined below shall be made by public announcement and shall be published in a newspaper of general circulation. The declaration shall become effective immediately upon such publication.

There are two basic conditions which can trigger the declaration of the WSC Plan:

Condition No. 1: Long and Short Term Water Supply Deficiencies

As outlined in Water Code 10632, the District's General Manager shall request the Board of Directors (Board) to authorize and implement provisions of the WSC Plan, which declares that the demand for District water is anticipated to be in excess of water supply. The request shall be made at a regular or special meeting of the Board where findings will dictate the necessity, if any, to implement the measures of the WSC Plan. The Board will have the authority to initiate or terminate any of the measures described in the WSC Plan.

Condition No. 2: Emergency Water Shortage Response

Emergency water shortages are defined as an unexpected event that prevents adequate water to be delivered to customers due to a problem in the District's water distribution system. By adopting this WSC Plan, the Board authorizes the General Manager to declare the extent of the water shortage emergency and to indicate which measures of the WSC Plan are needed.

2.2 Criteria for Water Shortage Stages

The District will continue to monitor water demands and supplies on a regular basis and shall determine when conditions warrant initiation or termination of each stage of the WSC Plan as follows:

Stage 1 – Water Watch: The term Water Watch acknowledges that while near term regional supply and storage conditions may from time to time improve due to wet weather, there are continued long term challenges that warrant continued wise and efficient use of water. These include ongoing regulatory restrictions on pumping from the Bay-Delta region for the State Water Project, which makes up a significant portion of RCWD's imported water supply. In addition, our Mediterranean climate and average rainfall of 14 inches in our

service area make ongoing efficient water use imperative. RCWD and other retail water agencies in California have been mandated by the state to work with customers to achieve a 20 percent reduction in per capita water use by the year 2020. Under Stage 1 conditions, customers are requested to continue to use water efficiently, maximize recycled water use, practice sensible voluntary water conservation and take advantage of the District's indoor and outdoor water conservation incentive programs to eliminate water waste. It should also be noted that water waste is in violation of California Law and District's Water Waste Prohibition Ordinance at any Stage. Agricultural customers participating in the MWD IAWP program shall comply with the ongoing terms of the program during its multi-year phase out. RCWD will set water budgets for IAWP participants at the level permitting by the MWD program terms and declared MWD supply conditions as they relate to the IAWP.

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Stage 2 – Water Alert: There is a probability that the District may not be able to meet all of the water demands of its customers. This may correlate to MWD's WSDM Plan stage of "Shortage" and the MWD Allocation Plan's Regional Shortage Level 1 through 2, or may mean local groundwater levels are lower than normal. Expected water shortages for the District's municipal and industrial (M & I) customers are less than 10 percent. Additional voluntary conservation measures will be called upon during this stage. During this stage it is anticipated that the District's agricultural customers will be asked to comply with reduction plans, mandatory certification and allocations designed to meet MWD's IAWP first level requirements. AG Request for Variance Forms will be considered but not guaranteed during Stage 2. Some nonessential outdoor water-use restrictions in the residential and commercial sectors may be implemented.

Stage 3 – Water Warning: Water supplies are not sufficient to meet the District's M & I demands by more than 10 percent, but less than 20 percent. This may correlate to MWD's WSDM Plan stage of "Severe Shortage" and the MWD Allocation Plan's Regional Shortage Level 3 through 4. During this stage it is anticipated that the District's agricultural customers will comply with additional IAWP demand restrictions including 10 and 20-percent reductions to site-specific allocations. AG Request for Variance Forms will NOT be considered during Stage 3 EXCEPT for AG-Domestic customer health and safety reasons. Some restrictions on certain non-essential outdoor residential, commercial and landscape water use will be implemented. Financial penalties for non-compliance of such restrictions will be imposed. Declaration of stage 3 will trigger the New Water Demand Off-set Program (NWDOP).

Stage 4 – Extreme Water Warning: Water supplies are not sufficient to meet the District's M & I demands by more than 20 percent, but less than 30 percent. This may correlate to MWD's WSDM Plan stage of "Extreme Shortage" and the MWD Allocation Plan's Regional Shortage Level 5 through

6. During this stage the District's agricultural customers will comply with additional IAWP demand restrictions that may include 45 and 60-percent reductions to site-specific allocations and urban landscapes will greatly reduce water use. AG Request for Variance Forms will NOT be considered during Stage 4 EXCEPT for AG-Domestic customer health and safety reasons. If this stage is the result of an extended drought and has been triggered by Condition No. 1 of Section 2 of this WSC Plan, the District will explore increased conservation incentives for demand management measures that will have immediate and substantial impacts on water demands. More severe restrictions on non-essential outdoor water use will be implemented. Significant financial penalties for non-compliance of such restrictions will be imposed.

Stage 5 – Water Emergency: Water supplies are not sufficient to meet the District's M & I demands by more than 30 percent. This may correlate to MWD's WSDM Plan stage of "Extreme Shortage" and the MWD Allocation Plan's Regional Shortage Level 7 through 10 or may be as a result of an emergency situation resulting in the inability of the District's water distribution system to deliver all of the District's supply. During this stage the District's agricultural customers will greatly reduce water consumption for all crops, or might even be discontinued. AG Request for Variance Forms will NOT be considered during Stage 5 EXCEPT for AG-Domestic customer health and safety reasons. Restrictions on all non-essential outdoor water use will also be implemented. Severe financial penalties for non-compliance of such restrictions will be imposed.

Section 3: Supply Shortage Contingency Measures

The following represents the shortage contingency measures the District will impose for its domestic (household), commercial/institutional, and agricultural customers. Through timely communication, using various local media outlets, the District will provide updates regarding supply conditions and WSC Plan Stages. The District is not responsible for any customer issues that may arise from the implementation of the WSC Plan or adjustment in timing of the WSC Plan's Stages.

3.1 Domestic (Household) Customers

Stage 2 – Water Alert (M & I shortage under 10 percent):

The following voluntary measures will be requested:

Outdoors

1. Irrigate lawns and landscape only between 8:00 p.m. and 7:00 a.m. (customers with weather-based irrigation controllers will be exempt from this requirement).
2. Eliminate sprinkler overspray from driveways and sidewalks. Divide irrigation runtimes into multiple cycles to eliminate run-off water that leaves the landscaped area.
3. Install a self-adjusting "Smart" irrigation controller. Ensure the controller has a manual mode that will allow compliance with higher stages of this water shortage plan.
4. Tune-up your irrigation system by checking for and repairing leaks and damaged sprinklers.
5. Use a broom instead of a hose to clean driveways, sidewalks and other hardscape surfaces.
6. Refrain from using decorative fountains unless they are equipped with a recycling system.
7. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with automatic shutoff valve.

Indoors

1. Wash only full loads of laundry and/or dishes.
2. Fix leaky faucets.
3. Shorten showers and turn off faucets while brushing teeth or shaving.
4. No penalties or mandatory restrictions will be imposed during this stage.

Stage 3 – Water Warning (M & I shortage from 10 to 20 percent):

The following mandatory measures will be imposed:

Outdoors

1. Irrigate lawns and landscape only between 8:00 p.m. and 7:00 a.m. (customers with weather-based irrigation controllers are exempt from this restriction).
2. Do not allow irrigation water to leave the landscaped area.
3. If new landscaping must be installed, only landscaping meeting the specifications of "California-Friendly" landscaping as defined by the Metropolitan Water District of Southern California will be allowed. Customer should plan new installations carefully. Newly installed plant materials may be unsustainable in higher stages of this water shortage contingency plan. Use a broom instead of a hose to clean driveways, sidewalks and other hardscape surfaces.
4. Eliminate sprinkler overspray from driveways and sidewalks. Divide irrigation runtimes into multiple cycles to eliminate run-off water that leaves the landscaped area.
5. Tune-up your irrigation system by checking for and repairing leaks and damaged sprinklers.
6. Refrain from using decorative fountains unless they are equipped with a recycling system.
7. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with automatic shutoff valve.

It is recommended but <u>not</u> mandatory that customers install a self-adjusting "Smart" irrigation controller and ensure the controller has a manual mode that will allow compliance with higher stages of this water shortage plan.

<u>Indoors</u>

1. Wash only full loads of laundry and/or dishes.
2. Fix leaky faucets.
3. Shorten showers and turn off faucets while brushing teeth or shaving.

The declaration of a stage 3 water warning will trigger implementation of the New Water Demand Offset Program for new or expanded water use. See the New Water Demand Offset Program plan for details.

Penalties for non-compliance <u>will</u> be imposed for flagrant or repeat violations (see Section 4).

<u>Stage 4 – Extreme Water Warning (M & I shortage from 20 to 30 percent):</u>

The following additional <u>mandatory</u> measures will be imposed:

<u>Outdoors</u>

1. Irrigate lawns and landscape only between 8:00 p.m. and 7:00 a.m. (customers with weather-based irrigation controllers will be exempt from this requirement).
2. Do not allow irrigation water to leave the landscaped area.

3. If new landscaping must be installed, only landscaping meeting the specifications of "California-Friendly" landscaping as defined by the Metropolitan Water District of Southern California will be allowed. Customers should plan new installations carefully. Newly installed plant materials may be unsustainable in higher stages of this Water Shortage Contingency Plan.
4. Washing of personal vehicles at home (including autos, trucks, trailers, motor homes, boats or others) is prohibited.
5. Eliminate sprinkler overspray from driveways and sidewalks. Divide irrigation runtimes into multiple cycles to eliminate run-off water that leaves the landscaped area.
6. Tune-up your irrigation system by checking for and repairing leaks and damaged sprinklers.
7. Refrain from using decorative fountains unless they are equipped with a recycling system.
8. Use a broom instead of a hose to clean driveways, sidewalks and other hardscape surfaces.

It is recommended but not mandatory that customers install a self-adjusting "Smart" irrigation controller and ensure the controller has a manual mode that will allow compliance with higher stages of this water shortage plan.

Indoors

1. Wash only full loads of laundry and/or dishes.
2. Fix leaky faucets.
3. Shorten showers and turn off faucets while brushing teeth or shaving.

Penalties for non-compliance will be imposed (see Section 4).

Stage 5 – Water Emergency (M & I shortage greater than 30 percent):

The following additional mandatory measures imposed:

Outdoors

1. No irrigation of lawns, landscapes and/or ornamental gardens. Vegetable gardens under 5,000 square feet in area grown for personal consumption are exempt.
2. Washing of personal vehicles at home (including autos, trucks, trailers, motor homes, boats, or others) is prohibited.
3. Water for refilling recreational swimming pools and spas is prohibited.
4. No replacement water may be provided for ponds or lakes.
5. Turn off all decorative fountains and consider using any remaining water to irrigate landscape. Make sure to empty completely so standing water does not attract insects.
6. Use a broom instead of a hose to clean driveways, sidewalks and other

hardscape surfaces.

7. Install pool and spa covers to minimize evaporative water loss and limit use of misting devices.

Indoors

1. Wash only full loads of laundry and/or dishes.
2. Fix leaky faucets.
3. Shorten showers and turn off faucets while brushing teeth or shaving.

Penalties for non-compliance will be imposed (see Section 4).

3.2 Commercial/Institutional and Landscape Customers

Stage 2 – Water Alert (M & I shortage under 10 percent):

The following voluntary measures will be requested:

1. All Commercial/Institutional and Landscape Customers, including but not limited to parks, school grounds, highway medians, commercial landscaping, and golf courses will be restricted to irrigation applications between 8:00 p.m. and 7:00 a.m. These irrigators will be advised to adjust automatic irrigation timers according to changing weather patterns and landscape requirements.

Customers irrigating with recycled water will be exempt from the watering restrictions imposed in Stage 2 provided signage on the site conforms to recycled water-use requirements and is clearly visible.

Customers that can demonstrate the use of an active "Smart" Irrigation Controller that is currently on the Irrigation Association's Smart Water Application Technology (SWAT) approved irrigation controller list will be exempt from the watering restrictions imposed in Stage 2 - 4.

2. Eliminate sprinkler overspray from driveways and sidewalks. Divide irrigation runtimes into multiple cycles to eliminate run-off water that leaves the landscaped area.
3. Install a self-adjusting "Smart" irrigation controller. Ensure the controller has a manual mode that will allow compliance with higher stages of this water shortage plan.
4. Refrain from using decorative fountains unless they are equipped with a recycling system.
5. Install pool and spa covers to minimize evaporative water loss.

No penalties or mandatory restrictions will be imposed during this stage.

Stage 3 – Water Warning (M & I shortage from 10 to 20 percent):

The following mandatory measures will be imposed:

1. All Commercial/Institutional and Landscape Customers, including but not limited to parks, school grounds, highway medians, commercial landscaping, and golf courses will be restricted to irrigation applications between 8:00 p.m. and 7:00 a.m.

Customers who can demonstrate the use of an active "Smart" Irrigation Controller that is currently on the Irrigation Association's Smart Water Application Technology (SWAT) approved irrigation controller list will be exempt from the watering restrictions imposed in Stage 2 - 4.

2. Recycled water customers will be exempt from Stage 3 restrictions provided signage on the site conforms to recycled water-use requirements and is clearly visible.
3. If new landscaping must be installed, only landscaping meeting the specifications of "California-Friendly" landscaping as defined by the Metropolitan Water District of Southern California will be allowed. Customer should plan new installation carefully. Newly installed plant materials may be unsustainable in higher stages of this Water Shortage Contingency Plan.
4. Eliminate sprinkler overspray from driveways and sidewalks. Divide irrigation runtimes into multiple cycles to eliminate run-off water that leaves the landscaped area.
5. No hosing down driveways, sidewalks or other hardscape except for California Department of Health Services prescribed health and sanitary reasons.
6. Commercial car wash operators will work to ensure most of the water used is captured and reaches the municipal wastewater system so that it can be recycled for reuse in community landscapes. Car wash operators shall work with the District to distribute discount coupons or other incentives to discourage the washing of vehicles in private driveways.
7. No commercial, industrial or institutional entity shall allow the use of its premises for charity or fundraising car washes.

It is recommended but not mandatory that customers install a self-adjusting "Smart" irrigation controller. Ensure the controller has a manual mode that will allow compliance with higher stages of this Water Shortage Plan.

The declaration of a Stage 3 water warning will trigger implementation of the New Water Demand Offset Program for new or expanded water use. See the New Demand Offset Program plan for details.

Penalties for non-compliance will be imposed for flagrant or repeat violations (see Section 4).

Stage 4 – Extreme Water Warning (M & I shortage from 20 to 30 percent):

The following additional mandatory measures imposed:

1. All Commercial/Institutional and Landscape Customers, including but not limited to parks, school grounds, highway medians, commercial landscaping, and golf courses will be restricted to irrigation applications between 8:00 pm and 7:00 am.
    a. Recycled-water customers will be exempt provided signage on the site conforms to recycled water-use requirements and is clearly visible.
    b. Customers that can demonstrate the use of an active "Smart" Irrigation Controller that is currently on the Irrigation Association's Smart Water Application Technology (SWAT) approved irrigation controller list will be exempt from the watering restrictions on irrigation.

2. If new landscaping must be installed, only landscaping meeting the specifications of "California-Friendly" landscaping as defined by the Metropolitan Water District of Southern California will be allowed. Customer should plan new installation carefully. Newly installed plant materials may be unsustainable in higher stages of this water shortage contingency plan.
3. Eliminate sprinkler overspray from driveways and sidewalks. Divide irrigation runtimes into multiple cycles to eliminate run-off water that leaves the landscaped area.
4. No new hydrant-construction or temporary construction meter permits will be issued by District.
5. No hosing down driveways, sidewalks, or other hardscape except for California Department of Health Services prescribed health and sanitary reasons.
6. Commercial car wash operators will work to ensure most of the water used is captured and reaches the municipal wastewater system so that it can be recycled for reuse in community landscapes. Car wash operators shall work with the District to distribute discount coupons or other incentives to discourage the washing of vehicles in private driveways.
7. No commercial, industrial or institutional entity shall allow the use of its premises for charity or fundraising car washes.
8. No water for decorative fountains may be used even if it has a recycling system.
9. Install pool and spa covers to minimize evaporative water loss.

Penalties for non-compliance will be imposed (see Section 4).

<u>Stage 5 – Water Emergency (M & I shortage greater than 30 percent):</u>

The following additional mandatory measures:

1. No irrigation of lawns and landscape (recycled water customers <u>may</u> be exempted provided signage on the site conforms to recycled water-use requirements and is <u>clearly</u> visible).
2. Water for refilling recreational swimming pools and spas is prohibited.
3. No water for commercial car washes.
4. All hydrant-construction and/or temporary construction meter permits will be rescinded by the District.
5. No planting of new landscaping (seed, sod, or other plant materials).
6. No replacement water will be provided for ponds or lakes. Aeration equipment shall be managed in such a way as to eliminate evaporative loss of water.
7. No hosing down driveways, sidewalks or other hardscape except for California Department of Health Services prescribed health and sanitary reasons.

8. No commercial, industrial or institutional entity shall allow the use of its premises for charity or fundraising car washes.
9. No water for decorative fountains may be used, even if it has a recycling system.

Penalties for non-compliance will be imposed (see Section 4).

3.3 Agricultural Customers

Although the District retains the right to implement actions independent of Metropolitan Water District, each successive stage, with respect to Agricultural Customers, will be triggered by actions associated with Metropolitan Water District's Interim Agricultural Water Program (IAWP) unless the District's WSC Plan or an individual Stage in the WSC Plan is triggered by a local event leading to either a Condition 1 scenario or a Condition 2 scenario as outlined in Section 2 of this WSC Plan.

Stage 2 – Water Alert (M & I shortage under 10 percent) IAWP at 30-percent reduction:

The District will implement and adopt through separate resolution an Agricultural Allocation Plan for recipients of discounted agricultural water. Each discount program participant will be given a site-specific maximum annual allocation based on data gathered through mandatory self-certification. Annual allocations will be divided into monthly allocation targets based on dry-year Evapotranspiration rates as recorded at either CIMIS station 62 or 137. Customers in the Santa Rosa Division will use station 62. Customers in the Rancho Division will use station 137. To accommodate various billing cycles, monthly targets will be divided further into daily allotments.

Following written or verbal contact from a representative of the District, self-certification activities may be verified at anytime during the mandatory call for reduction. Site verifications will be conducted at District expense.

Agricultural customers electing to ignore mandatory certification requirements will be given allocations based on the MWD IAWP reduction requirements plus 10 percent. Allocations will remain in effect until MWD rescinds the order for reduction or requests additional demand reduction. Financial penalties based on MWD IAWP guidelines will be passed through to program participants. Penalty amounts will directly reflect MWD penalties imposed on RCWD.

Stage 3 – Water Warning (M & I shortage from 10 to 20 percent) IAWP at 40 to 50-percent reduction:

Site specific allocations will be adjusted downward to match additional MWD calls for further agricultural water-use reduction. Reductions of 10 to 20 percent

from all site-specific allocations are expected. Financial penalties based on MWD IAWP guidelines will be passed through to program participants. Penalty amounts will directly reflect MWD penalties imposed on RCWD.

Stage 4 – Extreme Water Warning (M & I shortage from 20 to 30 percent) IAWP at 75 to 90-percent reduction:

Site specific allocations will be adjusted downward to match additional MWD calls for further agricultural water-use reduction. Reductions of 45 to 60 percent from all site-specific allocations are expected. Financial penalties based on MWD IAWP guidelines will be passed through to program participants. Penalties in excess of MWD IAWP amounts may be imposed by RCWD.

Stage 5 – Water Emergency (M & I shortage greater than 30 percent) IAWP at 100-percent reduction:

Site specific allocations will be adjusted downward to match additional MWD calls for further agricultural water-use reduction. Reductions in excess of 60 percent from all site-specific allocations are expected. Suspension of all agricultural water may be necessary. Financial penalties based on MWD IAWP guidelines will be passed through to program participants. Penalties in excess of MWD IAWP amounts may be imposed by RCWD.

Section 4: Enforcement and Variances

Measures called for in the stages of the District's WSC Plan will be primarily enforced through financial penalties. In extreme cases, certain types of outdoor water service may be discontinued until the emergency situation is over.

4.1 Domestic & Commercial Customers

For Stages 3 and 4 of the WSC Plan, domestic and commercial customers will have their allocation reduced to coincide with MWD's Supply Allocation Plan. For example if MWD implements a 10 percent reduction, RCWD customers will have their allocation reduced by 10 percent. Customers will therefore hit tier 2 charges 10 percent sooner than before. If customers exceed their allocation and begin paying tier 2 rates, they will also have to pay penalties. Any penalty will represent any MWD penalties imposed (the total MWD penalty would be allocated to customers based on a pro-rata share). All penalties collected would be used for additional administration of the WSC Plan, to pay MWD for penalties assessed to the District, to implement additional demand management measures during an extended water shortage as well as to replenish the Drought Cash Reserve for the District (see Section 5).

4.2 Agricultural Customers

In accordance with separate measures adopted in the District's AG Reduction Plan, a site-specific allocation will be assigned for permanent and non-permanent crops. Each crop type will be assigned a base water demand using reference Evapotranspiration (ET) and the generally accepted crop-coefficient for that crop. Different stages of the District's Water Shortage Contingency Plan would call for the prescribed allocation to be reduced and in some cases discontinued completely. Any water use above the specified reduction will be subject to a financial penalty as spelled out in the AG Reduction Plan.

Agricultural Customer penalties will represent the MWD penalties imposed under the MWD Interim Agricultural Water Program and levied solely as a result of agricultural activities during any of the District's WSC Plan stages. If MWD does not assess an IAWP penalty for a given stage of the District's WSC Plans, no penalties will be retained by the District. All penalties collected would be used to pay MWD for penalties assessed to the District or to fund conservation/efficiency programs for agricultural customers.

4.3 Variances

The District may, in writing, grant temporary variance for any penalties or restrictions imposed by the WSC Plan. Variances may be granted due to health and safety reasons or because of special circumstances in how the base water demand was established and the actual use during a restrictive stage.

All variances must be requested in writing within 15 days of the WSC Plan's staged implementation. The following information must be provided:

1. Name, contact phone number, service address and customer account number of petitioner;
2. Purpose of water use (e.g., domestic, commercial, agriculture);
3. Specific provision(s) of the WSC Plan from which the petitioner is requesting relief;
4. Detailed statement as to how the provision of the WSC Plan adversely affects the petitioner or what damage or harm will occur;
5. Description of the relief requested;
6. Period of time for which the variance is sought; and
7. Any alternative water use restrictions (for example indoor use) that the petitioner is taking or proposes to take to meet the intent of the WSC Plan.

Section 5: Revenue and Rate Impacts

Currently the District has a Cash Reserve Policy to deal with risk. One element of that reserve policy is a Drought Reserve. The Drought Reserve takes into account changes in the District's water supply operational costs and the reduced revenues from lower water sales. The target Drought Reserve level is $5.1 million. This reserve will be used to minimize any potential rate impacts caused by the implementation of the District's WSC Plan.

Any penalties collected through non-compliance of the WSC Plan would be partially used to replenish this Drought Reserve, implement additional demand management measures during an extended water shortage, contribute to increased administration costs, and pay for any MWD penalties imposed to the District.

Section 6: District's Emergency Actions

The Water Code 10632 requires 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.

The District operates in an area where the probability of an earthquake is high. Depending on the severity, an earthquake may damage the water system. The District's Emergency Response Plan provides a framework for an organized response to an earthquake emergency. The primary objectives of the WSC Plan are to maintain the functionality of the water distribution system, assess the system and if necessary make rapid repair to any damage, and prevent any further damage. The District's response to an earthquake will be directed by the General Manager.

The following are the District Response Phases in the event of an Earthquake:

Phase I – Inspection: A rapid inspection to determine injuries and any damage which might affect the distribution system.

Phase II – Report Back: Emergency communications flow: additional inspection procedures.

Phase III – Repair: Coordination of maintenance forces.

Phase IV – Management Procedures: Key Management responsibilities for the emergency.

Phase V – Operating/Maintenance/Engineering: Outlines procedures for division staff.

Prior to Phase I inspections, system operators and inspectors report to the Emergency Operating Center to receive assigned inspection routes. The Emergency Operating Center creates a communications hub for the District to efficiently manage their available resources. For example, personnel inspecting

Vail Dam, wastewater treatment facilities, and wells receive their assignments from and report their findings to the Emergency Operating Center. The Emergency Response WSC Plan contains ten areas that are inspected with driving directions for specific inspections routes. If inspections reveal damage to any of the areas the necessary repairs are made. Communications are ongoing at all phases of the response to an earthquake. The District has primary and secondary radio systems to insure communications will be available during an emergency. The Emergency Response WSC Plan also includes an analysis of the potential of an electrical power outage. The District depends on electricity to boost water to higher elevations via pumping stations, although some wells use natural gas as their energy source. In an emergency situation involving a power outage the District will utilize emergency generators to provide customers with a reliable source of water.

Section 7: Definitions for WSC Plan

1. Acre-foot: a uniform volume of water that will cover one acre (43,560 square feet) to a depth of 1 foot (approximately 325,851 gallons).
2. Aesthetic water use: water use for ornamental or decorative purposes including, but not limited to, fountains, reflecting pools and water gardens.
3. Agricultural water use: water used for the irrigation and maintenance of both permanent and non-permanent agricultural crops including, but not limited to, avocado, citrus, wine grapes, corn and other products for human consumption or the generation of feed for livestock.
4. Beneficial water use: the efficient use of water resources for agriculture, commercial, domestic, habitat, industrial or recreation purposes.
5. Billing Unit: the unit amount of water used to apply water rates for the purposes of calculating commodity charges for the customer water usage; equal to 100 cubic feet or 748 gallons of water.
6. California-Friendly landscaping: defined by Metropolitan Water District as a landscape that features low-water using plants, state-of-the-art irrigation and controllers, sustainable landscaping techniques, and maintenance plan. Specific guidelines can be found at www.bewaterwise.com.
7. CIMIS: California Irrigation Management Information System; additional information at wwwcimis.water.ca.gov.
8. Commercial/Institutional water use: water used in businesses producing goods, providing services or in multiple family dwellings (apartments and condominiums), home owners' associations (HOA) property owners' associations (POA), schools, hospitals and correctional facilities.
9. Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.
10. Demand management: water-efficiency measures, practices or incentives implemented by the District to reduce or change the pattern of customer water demand.
11. District: Rancho California Water District.
12. Domestic (household) water use: water used for outdoor landscape irrigation or recreation and indoor personal needs such as drinking, bathing, heating, cooking, sanitation, or for general cleaning.
13. Drought: an extended period of below-normal precipitation that can result in water-supply shortages, increased water demand, or both.
14. EMWD: Eastern Municipal Water District.
15. Evapotranspiration (ET): water lost from the surface of soils and plants through evaporation and transpiration, respectively.

16. Evapotranspiration (ET) rate: the quantity of water transpired from plant tissues and evaporated from the surface of surrounding soil, expressed as a depth of water in inches or feet; where the ET rate is affected by temperature, solar radiation, humidity, wind and soil moisture.

17. Hardscape: asphalt, concrete, masonry or wood surfaced areas including streets, parking lots, sidewalks, driveways, patios, and decks.

18. Irrigation: the application of water to soil to meet the water needs of crops, turf, shrubbery, gardens, or wildlife food and habitat not satisfied by rainfall.

19. Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks and rights-of-way and medians.

20. MWD: Metropolitan Water District of Southern California.

21. Non-permanent crop: agricultural commodity produced from plants that are removed following harvest and must be replanted to reproduce.

22. Non-essential water use: water uses that are neither essential nor required for the protection of public, health, safety, and welfare, including:
    a. Irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this WSC Plan;
    b. Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other equipment or vehicle;
    c. Use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas, unless required by the California Department of Health Services for health and sanitary reasons;
    d. Use of water to wash down buildings or structures for purposes other than immediate fire protection or hazardous substance remediation;
    e. Flushing gutters or permitting water to run or accumulate in any gutter, swale or street;
    f. Use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools used solely for recreational purposes;
    g. Use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life; and
    h. Use of water from hydrants for construction purposes or any other purposes other than fire fighting.

23. Non-potable water: water not suitable for drinking; which may be recycled water or imported raw water, or a blend of the two.

24. Permanent crop: agricultural commodity produced from plants that remain following harvest.

25. Potable water: water suitable for drinking.

26. Raw water: untreated imported water.

27. Recycled water: municipal wastewater that has been treated to meet all applicable federal, state and local standards for use in approved applications, including but not limited to agricultural and landscape irrigation. Recycled water is not for human consumption.

28. Run-off: Irrigation water (agriculture and landscape) which is not absorbed by the soil to which it is applied and flows from the planted area.

29. Water waste: the use of water that results in water flowing into any gutter, street, sidewalk, swale, or storm drain in a steady stream of flow during the course of a period of five or more continuous minutes or the use of water that results in water pooling in a public street, sidewalk, right-of-way or easement, or water applied to a landscape or agricultural crop in excess of the commonly accepted ET adjustment factor or crop-coefficient.

30. WMWD: Western Municipal Water District of Riverside County

APPENDIX F
RCWD WATER CONSERVATION POLICY

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RANCHO CALIFORNIA WATER DISTRICT
Water Conservation Policy

Prepared in Response to
Metropolitan Water District's
Request for
Conservation Compliance

42135 Winchester Road
Temecula, California
92592

(951) 296-6900

Adopted
May 14, 2009

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Section

Section 1. Findings and Declaration of Policy

The District finds and determines that because of the prevailing conditions in the State it is necessary and appropriate for the District to adopt, implement, and enforce a water conservation program to ensure sufficient water for human consumption, sanitation, and fire protection. The District further finds the waste or unreasonable use, or unreasonable method of use of water shall be prevented and that water conservation practices shall be encouraged at all times.

In times of drought or water supply cutbacks, provisions of this Policy may be modified in accordance with the Metropolitan Water District of Southern California's Water Surplus and Drought Management Plan, as well as Rancho California Water District's Water Shortage Contingency Plan (WSCP). This Policy is in effect at all times and defers updates and implementation strategies, regarding water conditions and supplies to the WSCP for timely communications and media outreach when stage alerts are executed.

Section 2.General Provisions

In order to comply with requirements of state legislation and the Best Management Practices, it shall be a violation of this Policy at any time to make, cause, or permit the use of water for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner constituting Waste. Customers shall abide by the following requirements:

1. Refrain from hosing down driveways and other hard surfaces, except for health or sanitary reasons.

2. Repair faucets, toilets, pipes and other potential sources of water leaks.

3. Irrigate landscape only between 8 pm and 7 am. This provision does not apply when:

    a. Manually watering during the establishment period of a new landscape.
    b. Supervised spot watering to address landscape issues.
    c. Temperatures are predicted to fall below freezing.
    d. Testing/repairing an irrigation system.
    e. The use of drip and point-to-point irrigation systems.
    f. Longer watering window is needed due to system constants.

4. Adjust and operate all landscape irrigation systems in a manner, which will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.

5. Prevent excessively irrigating any lawn or landscape area that would cause the sheeting of water to flow; eliminate water runoff from lawns or landscape areas into any gutters, streets, or alleys.

6. Do not use decorative fountains unless they are equipped with a re-circulating system.

7. When Installing plumbing fixtures use low-flow devices, except for those that require high-flow fixtures for health and/or sanitary reasons. Where possible, install pool and spa covers to minimize water loss due to evaporation during non-operating days.

8. Do not allow water to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve to avoid run off into gutters, streets or alleys.

9. When installing new landscaping, refer to the Water Use Classification of Landscape Species (WUCOLS). Plant low-water California Friendly Landscapes. Non-functional turf areas are not recommended. Turf lined channels are only permitted when justified by environmental regulations.

10. Refrain from watering during rain, or high winds by turning off irrigation timer.

Section 3.Penalties and Restitutions

All existing and future customers with excessive run off that would cause water to flow from property into any gutters, streets, or alleys are subject to the following:

Residential

a. For the first violation, the District shall issue a written notice of fact of such violation to the customer.

b. For the second violation, within twelve months from the first notice of violation the District shall issue a written notice of fact of such violation to the customer, requesting an "Evaluation Check List" (See Exhibit "A") be completed and returned to District within 14 days. Failure to complete and return evaluation will necessitate third violation to be enacted.

c. For a third violation within twelve months from the first notice of violation, a surcharge in the amount of $30.00 shall be added to the Customer's water bill.

d. For a fourth violation within twelve months from the first notice of violation, a surcharge in the amount of $60.00 shall be added to the Customer's water bill. The customer will also be required to have a "Water Use Efficiency Evaluation Report" (see Exhibit "B") performed within 21 days. District shall provide evaluation service. Failure to participate will necessitate fifth violation to be enacted

e. For the firth violation within twelve months from the first notice of violation, a surcharge in the amount of $300.00 shall be added to the Customer's water bill.

f. For the sixth violation within twelve months from the first notice of violation, a flow restrictor shall be installed at customers domestic or irrigation meter until problem is resolved.

Commercial

a. For the first violation, the District shall issue a written notice of fact of such violation to the customer.

b. For the second violation, within twelve months from the first notice of violation the District shall issue a written notice of fact of such violation to the customer, requesting an "Evaluation Check List" (See Exhibit "A") be completed and returned to District within 14 days. Failure to complete and return evaluation will necessitate third violation to be enacted.

c. For a third violation within twelve months from the first notice of violation, a surcharge in the amount of $30.00 shall be added to the Customer's water bill.

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f. For the sixth violation within twelve months from the first notice of violation, a flow restrictor shall be installed at customers domestic or irrigation meter until problem is resolved.

Customers are to pay water bills, penalties, in accordance with due dates on their bills. An Appeals Process is offered to customers that disagree with penalties outlined in this section of the ordinance. If the appeal is upheld in favor of the customer, appropriate monies will be refunded. Details of the appeals process are included in section 4 of this ordinance.

The District shall use the revenues derived from the implementation of this section of the ordinance for water use efficiency programs and rebates.

Section 4.Appeals Process

Any Customer may appeal the imposition of penalties and restitutions of this Policy, by filing a written request with the Planning Department for an appeals hearing. The District must receive the request within 30 days of the mailing of the required irrigation evaluation or penalty notice. A request for a hearing shall set forth, in detail, all facts supporting the request.

The Planning Department shall, within 15 days of receiving a request for an appeal hearing provide written notice to the customer of the hearing date, time, and place. The hearing date shall not be more than 30 days from the mailing of such notice by certified mail, unless a later date is agreed to by the customer.

At the hearing, a Planning Department representative will represent the District. The customer will have the opportunity to present information supporting his or her position concerning the required irrigation evaluation or penalty charges. After the hearing, the Planning Department shall deliver a written report to the General Manager setting forth findings of fact, conclusions, and a recommendation on whether to uphold, modify, or reverse the original penalties. Upon receipt of the written report, the General Manager shall issue his decision within 15 calendar days of the hearing. The written decision of the General Manager shall be sent to the customer by certified mail. The General Manager's decision shall be final on the 16th day after it is mailed, unless a request for a hearing is filed with the Board of Directors no later than 5:00 p.m. on the 15th day following such mailing.

Any customer may appeal a decision made by the General Manager, prior to the date that the General Manager's order becomes final, by filing a written request for a hearing with the Board of Directors. The request for the Board of Directors' hearing shall set forth in detail all the issues in dispute and all facts supporting the request. No later than 30 days after receipt of the request for a hearing, the Board of Directors shall either set the matter for a hearing, or deny the request for the hearing. Whether to grant or deny a request for a hearing on an appeal to the General Manager's decision shall be within the sole discretion of the Board of Directors.

If required, a hearing shall be held by the Board of Directors within 30 days of the date the request for a hearing was granted, unless a later date is agreed to by the customer and the Board of Directors. The Board of Directors shall make a determination whether

to uphold, modify, or reverse the General Manager's decision. The order of the Board of Directors shall be final upon its adoption. The written decision and order of the Board of Directors shall be sent to the customer by certified mail within 15 days after the close of the hearing.

If the matter is not heard within the required time, due to actions or inactions of the customer or the Board of Director's decision to deny the request for the hearing, the General Manager's decision shall be final.

Section 5.Variance Conditions

A variance may be issued by the District, in writing, to grant temporary variance for water uses otherwise prohibited under this Policy if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance, and if one or more of the following conditions are met:

1. Compliance with this Policy cannot be technically accomplished during the duration of a water supply shortage or other condition for which the Policy is in effect.

2. Alternative methods or technology used as part of District sanctioned trial or test study can be implemented which will achieve the same level of reduction in water use.

3. Doctor approved health circumstances, illness or injury will be considered on a case-by-case basis.

Written Variance shall be accepted by the Planning Department, and may be denied at sole discretion.

Section 6.Definitions of Terms

Appellant - means the Customer appealing a decision of the District for relief from the requirements of this Policy.

Appeal Process - refers to a set of procedures allowing an appellant the opportunity to present facts and details, supporting his or her position concerning penalties and restitutions of this policy.

Best Management Practices – defines the best and most proven water conservation methods for urban water users in California.

Board of Directors - means the Board of Directors of the Rancho California Water District.

California Friendly Landscapes - refers to landscape that features low-water using plants, state-of-the-art irrigation and controllers, sustainable landscaping techniques/ maintenance plan.

Customer - means any person, firm, partnership, association, corporation, or local political entity using water obtained from the water system of Rancho California Water District.

Evaluation Check List – will differ between the residential customer and the commercial customer. The appropriate Evaluation Check List will be provided by District to the customer for the purpose of evaluating the cause of water waste.

District – refers to Rancho California Water District.

Excessive Run Off - over irrigation of landscaped areas, leaks, or any other type of action that would cause water to flow into any gutter, streets, or alleys.

Non-Functional Turf Areas – (not recommended) a landscape turf area used for aesthetic purposes.

Variance Conditions – refers to a conflict requesting a temporary variation for water use.

Waste - means any unreasonable or non beneficial use of water, or any unreasonable method of use of water, including, but not limited to, the specific uses prohibited and restricted by this Ordinance as hereinafter set forth

Water Use Classification of Landscape Species (WUCOLS) – is a guide to help landscape professionals identify irrigation water needs of landscape species. It can be used either for the selection of species or to assist in developing irrigation schedules. It is not intended to be used as a required or approved list by RCWD for selection of plant species – *the WUCOLS guide is provided by District upon request.*

Water Use Efficiency Evaluation Report – is a standard of site data collections to efficiently evaluate the performance of an irrigation system.

In times of drought or water supply cutbacks, provisions of this Policy may be modified in accordance with the Metropolitan Water District of Southern California's Water Surplus and Drought Management Plan, as well as Rancho California Water District's Water Shortage Contingency Plan, or action taken by the Board of Directors.

Exhibit "A" Evaluation Check List

RESIDENTIAL

NAME:_____ PHONE NUMBER:_____

ADDRESS:_____

ACCOUNT NUMBER:_____

TOTAL LANDSCAPED AREA IN SQUARE FEET: _____

SYSTEM ON A TIMER: ☐YES ☐NO BRAND OF TIMER _____

TIME OF DAY IRRIGATION RUNS (S): _____ A.M _____ P.M.

NUMBER OF TIMES PER DAY:_____

NUMBER OF DAYS PER WEEK SYSTEM RUNS: _____

CURRENT WATERING SCHEDULE

VALVE	TYPE OF SPRINKLER'S	RUN TIME PER DAY	TURF / SHRUBS	LOCATION
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				

DATE:_____

CUSTOMER SIGNATURE:_____

Please send copy of the report to:

Bill Stephens
Rancho California Water District
PO Box 9017
Temecula, Ca. 92589-9017

COMMERCIAL **Exhibit "A.1" Evaluation Check List**

Site Name: _____ Date: _____

Inspected by: _____ Page# _____

Water Meter #: _____

Controller Identification								
Station Number:								
Plant Material Type								
Sprinkler Type								
Observed Problems:								
Valve Malfunctions								
Low Pressure								
High Pressure								
Titled Sprinklers								
Spray Deflection								
Sunken Sprinklers								
Plugged Equipment								
Arc Misalignment								
Low Sprinkler Drainage								
Leaky Seals or Fittings								
Lateral or Drip Line Leaks								
Missing or Broken Heads								
Slow Drainage or Ponding								
Compaction / Thatch / Roof								
Notes and Comments:								

Please send copy of the report to: Bill Stephens
Rancho California Water District
PO Box 9017
Temecula, Ca. 92589-9017

Water Use Efficiency Evaluation Report

Irrigation Controller Data

Controller A «brand name and model»

Controller A has «number of » stations with «number» start times and irrigates «number» days a week. The irrigation system has «add features, rain switch ect. » During the evaluation it was noted «give turf distribution uniformity and precipitation rate » «add any special comments »

Controller B «brand name and model»

Controller B has «number of » stations with «number » start times and irrigates «number » days a week. The irrigation system has «add features, rain switch ect. » During the evaluation it was noted «give turf distribution uniformity and precipitation rate » «add any special comments ».

The irrigation system is managed by «name of person » «company name, address and phone # »

Soil Survey

A«# of inches »inch soil core sample was extracted and evaluated. The moisture reading content indicates« indicate saturated, wet or dry »soil, with a root zone depth of «# of inches » inches. Elementary analyses indicates that «add any additional information ». The soil is of various combinations; «give %»% sand, «give %» % silt and «give %» % clay. The soil texture is«indicate soil texture» soil, with an intake rate of«give inches» in/hr. .

Landscape Assessment

The total landscaped area was measured and is approximately «show square feet» sq. ft. «show square feet» sq. ft is considered functional turf (a landscaped turf area that serves as a surface for such purposes as playing a sport or gathering for group activities) and «show square feet» sq. ft. non-functional turf (used for aesthetic purposes) which includes trees, shrubs and ground cover. The turfs general appearance is in «indicate good, fair or poor» condition.

Field Observations

Listed are items that require attention and once corrected will help improve water efficiency
(copy as needed)

CONTROLLER

Station # 1
Valve run time;
Sq. ft. of functional turf;
Sq. ft. of non-functional turf;
Type of sprinklers;
Observations;

Station # 2
Valve run time;
Sq. ft. of functional turf;
Sq. ft. of non-functional turf;
Type of sprinklers;
Observations;

Station # 3
Valve run time;
Sq. ft. of functional turf;
Sq. ft. of non-functional turf;
Type of sprinklers;
Observations;

Station # 4
Valve run time;
Sq. ft. of functional turf;
Sq. ft. of non-functional turf;
Type of sprinklers;
Observations;

Station # 5
Valve run time;
Sq. ft. of functional turf;
Sq. ft. of non-functional turf;
Type of sprinklers;
Observations;

Station # 6
Valve run time;
Sq. ft. of functional turf;
Sq. ft. of non-functional turf;
Type of sprinklers;
Observations;

CODES

Codes are to be used to identify problems and should be noted in station observations

code 1	Hydrozoning; valves not separated by plant water requirements, grass and shrubs not recommended on same valve.
code 2	Functional turf.
code 3	Non-functional turf
code 4	Valve malfunctioning; over 30 seconds to close, need to rebuild or replace.
code 5	Missing sprinkler; causing flooding, loss of water and low pressure.
code 6	Broken sprinkler; causing flooding, loss of water and low pressure.
code 7	Plugged equipment; system needs to be flushed, sprinkler nozzles and filters cleaned.
code 8	Leaky sprinkler seals; water spraying out of the side of the sprinkler casing.
code 9	Spray deflection; grass blocking spray pattern, add riser and cut grass around sprinklers.
code 10	Spray deflection; shrubs blocking spray pattern, add riser and cut shrubs.
code 11	Sprinkler spacing irregular; spacing of sprinklers not consistent with design layout.
code 12	Tilted sprinklers; sprinklers not parallel to the soil, causing poor coverage and erosion.
code 13	Sunken sprinklers; sprinklers not popping up above foliage, compressed or need to add riser.
code 14	Arc misalignment; over spray, sprinkler spray arc needs adjusted by set screw on sprinkler head.
code 15	Mixed nozzles; sprinkler nozzles should be matched.
code 16	Mixed sprinklers; a common practice to replace broken sprinklers with whatever is handy, this does not make for a uniform distribution system.
code 17	High pressure; misting at sprinkler head, adjust by turning down valve, adjusting set screw and check nozzle size.

Cont.

code 18	Low pressure; sprinklers not popping up. Check for line break, or too many sprinkler on one line.
code 19	Too many sprinklers; it appears that too many sprinklers are being run off of one valve.
code 20	Over spray; sprinklers are over spraying onto hardscape and wasting water, potential hazard.
code 19	Adjustments; poor coverage, sprinklers should reach head-to head coverage (100%) to the next sprinkler, need to adjust.
code 21	Broken pipe; causing flooding, erosion and unsafe conditions.
code 22	Low head drainage; install a check valve on the lowest sprinkler head.
code 23	Brown spots; poor coverage do to
code 24	Water stains on asphalt and side walk, runoff due to over watering or over spray of sprinklers. Over watering can cause root rot and any fertilizer to be washed pass the root zone.
code 25	Convert spray system to drip. This conversion can save up to 75% of water use.
code 26	Drip emitters plugged; clean Y filters every 6 months. Replace plugged emitters.
code 27	Add wood chip mulch to exposed soil around plants. This will help to conserve water by holding in moisture and aid in weed control, add about 3"
code 28	Sprinkler(s) not oscillating

Please send copy of the report to:

Bill Stephens
Rancho California Water District
PO Box 9017
Temecula, Ca. 92589-9017