The driest three consecutive years are based on historical rainfall data from 1935 to 1998. Using projected demand data for 2005 and 2010, and assuming a normal hydrology; the demands for 2006, 2007, and 2008 were interpolated. Then the hydrology factors for 1988, 1989, and 1990 were applied to the 2006, 2007, and 2008 estimates to obtain the estimates presented in Table 3.1. Treated imported water supply decreases from 2007 to 2008 due to the model assumption of applying the 1990 hydrology. The year 1990 was a hydrology year in which MWDSC limited treated water supply for agricultural demands by 25 percent, which is also reflected in the agricultural deficit presented in Table 5-1. If a severe drought period were to occur MWDSC may be required to implement savings strategies from the WSDM Plan discussed in Section 5.2 and RCWD may enact its drought resolution. If RCWD were in a situation of increased reliance on imported water it will experience higher operating costs. This is discussed further in Section 5.5.6.

5.5.3 Water Code Section 10632 (c)

Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

RCWD operates in an area where the probability of an earthquake is high. Depending on the severity, an earthquake may damage the water system. RCWD's Emergency Response Plan provides a framework for an organized response to an earthquake 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 will be directed by the General Manager.

RCWD has 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 personnel.

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 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.

5.5.4 Water Code Section 10632 (d-f)

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. (f) Penalties or charges for excessive use, where applicable.

As presented in Section 5.5.1, 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.

Currently, RCWD does not have set charges for excessive water other than its Tier II rate structure. The Tier II rate charge is $81 per acre-foot ($0.18595 per hcf) in addition to the normal water rate. This is applied to customers who exceed their water allocation determined by their customer class. When it is required, RCWD will pass through penalties from MWDSC to its customers. No other prohibitions are set forth by RCWD beyond those presented in Section 5.5.1.

5.5.5 Water Code Section 10632 (g)

An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

RCWD's current rate structure is designed to mitigate the impacts of reduced sales volumes through adequate fixed revenue coverage. As stated in RCWD's 2004

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".

According to the Fiscal year 2005-2006 Operating and Non-Operating Budget report, local water production saves the district $9,000,000 in annual operating costs when compared to the cost of import water. In ideal conditions the District's goal is to produce 30,000 acre-feet of local water annually. In a prolonged drought situation the goal may be dropped to 25,000 acre-feet. This would increase RCWD's water production costs by $1,500,000. Further, prolonged drought conditions will likely result in MWDSC discontinuing the reduced rate for recharge water, and its agricultural credit program. The discontinuation of these programs would increase RCWD's costs by $1,000,000 and $1,800,000 respectively. Therefore, if drought conditions caused local groundwater production to be reduced by 5,000 acre-feet, and MWDSC discontinued its reduced rate for recharge water and its agricultural credit program the District's operating charges would increase by $4,300,000. In preparation for such a condition, RCWD has a Drought Reserve that is set at one year's impact of estimated drought costs. The reserve requirement is $4,300,000 and protects RCWD and its customers should a drought situation arise.

5.5.6 Water Code Section 10632 (h & i)

(h) A draft water shortage contingency resolution or ordinance. (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

RCWD's water shortage resolution was discussed in Section 5.5.1, and a copy of the ordinance is attached in Appendix B. The last ordinance was drafted in 1991, however, the District's fiscal year 2005-2006 report on Operating and Non-Operating Budgets lists updating the current Drought Ordinance as an objective. The target date for the update is December 2005.

If the water saving actions contained within the ordinance are ever necessitated by water shortage conditions, 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.

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Section 6
Water Recycling

6.1 Agency Participation in Recycled Water Planning

Recycled water planning within Rancho California Water District's (RCWD) service area requires close coordination with several agencies. RCWD has recently developed a Regional Integrated Resources Plan or IRP. The IRP evaluated a number of alternatives to increase recycled water within RCWD's service area.

Additionally, the Santa Margarita Water Supply Augmentation Study was conducted by Eastern Municipal Water District (EMWD), RCWD and the 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.

Participating agencies for both the IRP and Santa Margarita Water Supply Augmentation Study are summarized in Table 6-1.

Table 6-1
Participating Agencies in Recycled Water Plan

Participating Agencies	Santa Margarita Water Supply Augmentation Study[1]	RCWD IRP[2]
RCWD	x	x
Metropolitan Water District of Southern California		x
Eastern MWD	x	x
Western MWD		x
US Bureau of Reclamation	x	
1 - Santa Margarita Water Supply Augmentation Study (CDM 2005)		
2 - RCWD Regional Integrated Resources Plan (CDM 2005)		

6.2 Wastewater Collection and Treatment Systems

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 their systems and treat it at two water reclamation facilities: the Santa Rosa Water Reclamation facility (SRWRF), operated by RCWD; and the Temecula Valley Regional Water Reclamation Facility (TVRWRF), operated by EMWD.

Table 6-2 summarizes the past, current, and projected average dry weather wastewater volumes collected and treated and the quantity of wastewater treated to recycled water standards for treatment plants within RCWD's service area. Between 2005 and 2030 the average wastewater collected between the two treatment plants is

expected to almost double from 18,594 million gallons per day (mgd) to 34,780 mgd. The entire amount of wastewater collected is expected to meet recycled water standards. Utilization of treated effluent for recycled water use after further treatment is projected to increase from 36 percent in 2005 to 79 percent in 2030.

Table 6-2
Wastewater Collection and Treatment

Average Wastewater Collected (Acre-Feet)						
Wastewater Plant	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
TVRWRF (EMWD)	14,114	16,970	19,827	21,693	23,560	25,427
SRWRF (RCWD)	4,481	5,685	6,889	7,710	8,532	9,353
Total	18,594	22,655	26,715	29,404	32,092	34,780
Quantity Meeting Recycled Water Standards (Acre-Feet)						
Wastewater Plant	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
TVRWRF (EMWD)	14,114	16,970	19,827	21,693	23,560	25,427
SRWRF (RCWD)	4,481	5,685	6,889	7,710	8,532	9,353
Total	18,594	22,655	26,715	29,404	32,092	34,780

Source: Santa Margarita Water Supply Augmentation Study (CDM, 2005).

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 disposed and eventually ends up in the ocean.

Table 6-3 summarizes the disposal method, treatment levels, and past, current, and projected discharge volumes. All effluent at TVWRF is treated to Title 22 standards. Portions of the effluent that are not used immediately or stored are discharged to Temescal Creek and ultimately the Pacific Ocean. As indicated in the table, SRWRF does not discharge effluent, rather all water is treated to Title 22 standards and either immediately used or stored for future use. The amount of water discharged is expected to increase by 9,521 acre-feet between 2005 and 2030.

Table 6-3
Wastewater Treatment and Disposal (Acre-Feet)

Wastewater Plant	Disposal Method	Treatment	2005	2010	2015	2020	2025	2030
TVRWRF (EMWD)	Ocean via Temescal Creek	Title 22	6,945	9,017	11,089	12,882	14,674	16,466
SRWRF (RCWD)	All Recycled Water Used	Title 22	0	0	0	0	0	0
Total			**6,945**	**9,017**	**11,089**	**12,882**	**14,674**	**16,466**

Source: Santa Margarita Water Supply Augmentation Study (CDM, 2005).

6.2.1 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, Murrieta County Water District (MCWD), and a portion of Elsinore Valley Water District (EVMWD). The MCWD area is expected to have the greatest population grown leading to an increase in flows from 851 AFY in 2005 to 3,663 AFY in 2030 or 0.76 mgd to 3.3 mgd. The portion of EVMWD's service area served by this facility is expected to have the least growth increasing from 1,535 AFY in 2005 to 1,647 AFY in 2030 or 1,4 mgd to 1.5 mgd. Total projected wastewater flows will almost double for this facility between 2005 and 2030.

All reclaimed 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.

6.2.2 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 MCWD and EVMWD service areas. Projected wastewater flows will increase most dramatically from EMWD will increase more than twofold from 4,481 AFY to 9,521 AFY or 4 mgd to 10 mgd. Total flows for TVWRF will increase from 12,658 AFY to 25,539 AFY or 11.3 mgd to 22.7 mgd.

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, reclaimed water is conveyed to 450 MG storage ponds located 10 miles north in Winchester, providing reclaimed 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.

Reclaimed 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.

6.3 Current and Projected Uses of Recycled Water

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 2005, the total recycled water used was 6,691 acre-feet per year.

Water quality concerns in the Santa Margarita River Watershed prevent RCWD from discharging reclaimed 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.

As stated in Section 6.2.1, SRWRF currently recycles all of its reclaimed water. Its reclaimed 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 of capacity, prior to distribution. There is an additional 450 MG of storage available north of Winchester, and reclaimed 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 6-4 and 6-5 summarize current and projected recycled water use, respectively. The use of recycled water for landscaping will be the largest use until 2025, when the projected MF/RO facility will start serving agricultural users with highly treated recycled water.

Table 6-4
Current Recycled Water Uses (AFY)

User type	Treatment Level	2005
Landscape[1]	Title 22	6,497
Agriculture[2]	Title 22	194
	Total	6,691

Source: Santa Margurita Water Supply Augmentation Study, 2005.
[1]Includes flow supplied by both TVRWRF and SRWRF.
[2]Includes flow supplied by TVRWRF.

Table 6-5
Projected Future Use of Recycled Water in RCWD Service Area (AFY)

User type	2010	2015	2020	2025	2030
Landscape	7,700	8,900	9,700	10,500	11,400
Agriculture	190	190	190	13,800	13,800
Total	7,890	9,090	9,890	24,300	25,200

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)

Table 6-6 compares the 2000 UWMP projections for recycled water use to the actual amount of recycled water used for year 2005. Actual recycled water use in 2005 exceeded projected water use by 2,317 acre-feet.

Table 6-6
Recycled Water Uses - 2000 Projection compared with 2005 actual (AFY)

User type	2000 Projection for 2005	2005 Actual Use
Landscape[1]	4,180	6,497
Total	4,180	6,497

Source: 2000 RCWD UWMP, 2000 and Santa Margurita Water Supply Augmentation Study, 2005

Potential recycled water uses in the RCWD area are illustrated in Table 6-7. These potential uses represent the demands for water that could be served with recycled water, but do not account for water quality requirements or availability of recycled water supply. For example, the maximum available recycled water supply for RCWD by 2030 from both the SRWRF and the TVRWRF is approximately 27,000 AFY, whereas the potential recycled water demand by 2030 is approximately 90,000 AFY.

Table 6-7
Potential Recycled Water Uses (AFY)

User type	Treatment Level	2010	2015	2020	2025	2030
Groundwater Recharge	MF/RO[2]	35,000	35,000	35,000	35,000	35,000
Landscape	Title 22	4,481	5,699	6,917	8,135	9,353
Tolerant Agriculture	MF/RO[2]	38,000	39,500	41,000	43,500	46,000
Total		77,481	80,199	82,917	86,635	90,353

Source: Santa Margurita Water Supply Augmentation Study, 2005.
[1] This potential does not take into account the availability of recycled water or the required quality needed.
[2] MF/RO = microfiltration/reverse osmosis.

6.4 Encouraging Recycled Water Use

Numerous methods are utilized by RCWD to encourage recycled water use. These methods are further described below.

6.4.1 Funding

Capital risks associated with recycled water projects are significant hurdles towards increase recycled water production and use. Similar to a potable water system, treatment facilities, distribution networks, pumping stations, and storage reservoirs are required to adequately supply a reliable source of recycled water. These expensive capital investments result in high per unit acre costs, especially if demand is limited in the beginning of the project. Many times the cost per unit is more than purchasing other non-recycled supplies.

RCWD offers recycled water to its customers at a cost less than that of potable water as a financial incentive through its local projects program to encourage the use of recycled water. Additionally, RCWD will construct the MF/RO facility, expected to be online by 2025, that will provide an additional 16,000 AFY of recycled water.

State propositions have dedicated allocations towards water recycling. Proposition 204 provides funding up to $60 million for water recycling loans in California. Proposition 13 provides up to $40 million in grants and low interest loans.

Financial incentives tend to drive the per unit cost of recycled water down and assist in the encouragement of recycled water use. Projects that tend to spread the capital CALFED has recommended that the state and federal government spend $1.5 to 2 billion over the next seven years on water use efficiency, including water recycling.

6.4.2 Partnerships to Encourage Water Recycling

Partnerships between agencies are another means of encouraging recycled water use. Financially, the initial capital investment is spread between two agencies instead of one. Most recycled water production efforts require close coordination between multiple agencies. At a minimum wastewater, groundwater, and water agencies are all impacted by recycled water production. Recycled water production efforts tend to cross existing jurisdiction boundaries and require new management strategies to ensure all parties concerns are met. Additionally, the previously discussed Santa Margarita Water Supply Augmentation Study fostered coordination among EMWD, RCWD and the Bureau of Reclamation.

Projected yields from encouraging partnerships to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.4.3 Regulatory Issues

Both the RWQCB and DHS are involved with water recycling use. The local RWQCB is the permitting authority and DHS regulates recycled water use from a health concern and standards viewpoint. Title 22 of the California Administrative Code provides specific regulations for treatment levels and reuse applications. Currently, there is no uniform criteria for regulating groundwater recharge applications requiring state agency review on a case-by-case basis. A uniform criteria for regulating groundwater recharge would encourage agencies that are reluctant to currently pursue such options based on unknown requirements to pursue groundwater recharge with recycled water.

Projected yields from involvement in regulatory issues to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.4.4 Research to Encourage Recycled Water Use

RCWD supports research efforts to encourage recycled water efforts. These include conducting studies and research to address public concerns, develop new technologies, and health effects assessments. Addressing public concerns is required to gain the support of stakeholders early on in the planning process. From an aesthetic standpoint the public tends to have negative connotations associated with recycling wastewater. Education is required to inform the public of treatment processes. Developing new technologies is a prerequisite to reduce recycled water production

costs. Cost is a major factor deterring agencies from increasing recycled water production. Health effects assessments have a two-fold purpose of alleviating public concerns and ensuring the protection of the public and environment.

Projected yields from research to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.5 Optimizing Recycled Water Use

Over the next twenty five years, recycled water use is projected to increase over three times current levels to 25,200 AFY in 2030. This will reuse over 85 percent of the wastewater generated in RCWD's service area and surrounding areas.

RCWD plans to take numerous actions to facilitate the use and production of recycled water by water and wastewater agencies within RCWD's service area to assist in meeting these projections.

- Install the MR/RO facility to add almost 14,000 AFY of reclaimed water by 2025.
- Apply for Bond funding such as Prop 50.
- Encourage MWD to participate in studies that will benefit recycled water production
- Support MWD in deriving solutions to regulatory issues
- Participation in sub-regional MWD facility studies, such as the Riverside/ San Diego area study

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Section 7
Water Quality Impacts on Reliability

7.1 Introduction

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

California Title 22 Drinking Water Standards (Title 22) incorporates the federal requirements of the Safe Drinking Water Act, 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 RCWD and MWDSC. In order to be in compliance with Title 22, each agency must ensure that the regulated chemicals meet established primary drinking water standards to ensure the safety of the water supply. In addition to the primary drinking water standards, secondary drinking water standards have been set for some minerals based on non-health related aesthetics, such as taste and odor. Both primary and secondary standards are expressed as the maximum contaminated levels (MCL) that are allowable for a given constituent. Unregulated chemicals do not have established drinking water standards, but are chemicals of concern for which standards may be eventually adopted. These unregulated chemicals often have a "notification level", which is a health based advisory level established by Department of Health Services for chemicals in drinking water that lack MCLs.

As illustrated in Table 7-1, RCWD has accounted for known and foreseeable water quality impacts in their current management strategies. RCWD does not anticipate water quality impacts that would either reduce the water supply available or that cannot be handled through existing management strategies.

Table 7-1
Current & Projected Water Supply Changes Due to Water Quality Percentage

Water Source	2005	2010	2015	2020	2025	2030
Local Groundwater Production	0	0	0	0	0	0
MWD	0	0	0	0	0	0
Total	0	0	0	0	0	0

Each of the water sources and any current or future impacts to water quality are discussed below.

7.2 Groundwater Quality

RCWD continually monitors the water quality of its eight groundwater basins and 54 wells. Every year RCWD conducts over 2,000 tests for water quality on each of its wells and throughout the distribution system.

Exceedances of Drinking Water Standards

Sampling at RCWD's wells between 2002 and 2004 has indicated that the primary MCL standard of 2 mg/L for Fluoride has ranged between 0.2 and 7.6. Fluoride occurs in the groundwater basins as a result of natural erosion. Well sampling ranges reflect the highest reading and lowest reading from all of RCWD'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 MWD water. The distribution system average level of fluoride was 0.4 mg/L, well below the MCL.

Well sampling has also indicated that the secondary MCL of 50 ug/L for manganese has ranged between non-detect and 250 ug/L. 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.

7.3 Metropolitan Water District of Southern California

RCWD is a member agency of both EMWD and WMWD. Both of theses wholesalers are members of the MWD. RCWD purchases its water through EMWD and WMWD, but receives its water directly from turnouts in MWD's pipelines. MWD has two primary sources of water, the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Imported water is served as a blend of both sources dependent upon seasonality. Colorado River water tends to be higher in Total Dissolved Solids and lower in dissolved organics. SWP water usually has a lower TDS but higher organic material, which can lead to formation of disinfection byproducts (DBP's). MWD recognizes the impacts of water quality on its member agencies and has embraced water quality planning in its Integrated Resources Plan and monitoring efforts to address water quality issues. Planning efforts have identified management strategies that allow flexibility in operations to improve water quality and source protection while maintaining reliability. MWD's water quality staff conducts both required monitoring and monitoring for constituents of concern that are currently unregulated. Over 300,000 water quality tests are performed each year.

7.3.1 MWD Water Quality Issues

Total Dissolved Solids Management

High TDS levels in imported water delivered by MWD to RCWD impacts RCWD's management of water resources and can adversely affect agriculture. High TDS levels

in potable water leads to increased recycled water treatment costs, results in increased water losses during the recycled water treatment processes, reductions in recycled water use as demand decreases for recycled water with high TDS levels, recycled water does not meet RWQCB standards, brine volumes increase, and ultimately the ability to use the underlying groundwater basins for water storage could be diminished. MWD has established an operational policy objective to deliver water to each of its member agencies at a TDS of 500 mg/l when feasible. This requires careful operational planning and management to achieve.

Colorado River Aqueduct

CRA water has high TDS levels, averaging 650 mg/L during normal water years. 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. In times of extreme droughts salinity levels could exceed 900mg/L. A long term salinity management strategy is in place at the state and federal level for the Colorado River Basin. Funds are appropriated annually to help fund salinity mitigation and reduction projects throughout the watershed.

State Water Project

SWP TDS levels are significantly lower than CRA water, averaging 250mg/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 issues, and evaporation losses 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 Sacramento San Joaquin 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 MWDSC'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 MWDSC's salinity objective and maintain water supply reliability. MWD'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."

Management Actions

MWD has taken numerous actions to reduce TDS concentrations in its water supplies. In 1999, MWD's Board adopted a Salinity Action Plan and a Salinity Management Policy with the goal of delivering water with salinity levels less than 500mg/L. A three year joint effort between the US Bureau of Reclamation and a task force of stakeholders led to the development of the Action Plan. A Salinity Summit attended by representatives from over 60 agencies was held as the Action Plan neared completion to discuss regional salinity issues and how to work together to attain salinity management goals. Components of the action plan include:

- Imported water source control and salinity reductions
- Distribution system salinity management actions
- Collaborative actions with other agencies
- Local salinity management actions to protect groundwater and recycled water supplies.

Under the Action Plan, MWD is reliant upon blending of its source water to meet salinity goals. It is anticipated that the TDS goal will be met in 7 out of 10 years. Hydrologic conditions would result in MWD not achieving this goal in the other three years. Agencies receiving water from MWD, such as RCWD, are cognizant of this and have taken this concern into development of their management strategies.

MWD has obtained Proposition 13 funding to improve salinity levels for The Water Quality Exchange Partnership and The Desalination Research and Innovation Partnership (DRIP) programs. MWD received $20 million to develop a water exchange partnership to access high quality water from the Sierras in exchange for SWP water. Funds are being used to develop the program and construct additional infrastructure. A total of $4 million was received for the DRIP program to develop cost-effective advanced water treatment technologies for removing salts from the CRA, brackish groundwater, wastewater, and agricultural drainage.

Under the CALFED Bay-Delta Program actions are already reducing TDS loading in SWP water and more actions are planned for the next 30 years. Actions in progress include improved management of salts in the San Joaquin Valley, upstream source control, desalination demonstration projects, and programs to control stormwater runoff into SWP aqueducts. In the long-term, additional projects are planned to reduce short-term variations in TDS levels and the long-term average salinity levels.

Without reductions in TDS levels in both the short-term variations and long term average, desalination of CRA water may be needed. However, at the present time current technologies are expensive and 5 to 10 percent of the CRA water would be lost during the treatment process. The DRIP program is designed to assist in obtaining a viable solution to reducing CRA TDS levels.

Perchlorate Management

Perchlorate has been detected at low levels in the CRA water supply, but not in the SWP water supply thus this discussion will focus on the CRA water supply. An exceedance level for perchlorate has not been adopted at this time by DHS. However, DHS 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. DHS 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.

MWD 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. The Nevada Department of Environmental Protection manages a remediation project in Henderson area. Since inception the amount of perchlorate entering the Colorado River has been reduced from 900 pounds per day in 1997 to less than 150 pounds per day as of December 2004.

Management Actions
In 2002, MWD adopted a Perchlorate Action Plan. Plan objectives include:

- 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 MWD Board and member agencies

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

Total Organic Carbon and Bromide Management

Treatment of SWP water supplies containing high levels of total organic carbon (TOC) and bromide with disinfectants, such as chlorine, creates disinfection byproducts (DBPs) linked to specific cancer types. CRA water does not have high levels of TOCs and bromide. TOC and bromide in the Delta region of the SWP are of a significant concern to MWD as concentration levels increase as Delta water is impacted by agricultural drainage and seawater intrusion. In 1998, the USEPA adopted more stringent regulations for DBPs that took effect in 2002. Even more stringent regulations are expected to be proposed in 2005.

Management Actions

MWD's Board adopted a Statement of Needs for the CALFED Bay-Delta Program in 1999 stating that MWD requires a safe drinking water supply for compliance with existing and future regulatory requirements. CALFED's Program has developed numerous conceptual actions to improve Bay/Delta water, however MWD desires CALFED to adopt water quality improvement milestones. These milestones are necessary to assure that MWD and its member agencies will be able to comply with pending water quality regulations.

MWD's Board has committed to install ozone treatment processes at its two treatment plants that solely treat SWP water to avoid the production of DBPs through chlorination. In addition to the concern of DBPs, some studies have linked negative reproductive and developmental effects to chlorinated water. The other three treatment plants that receive a combination of SWP and CRA water utilize blending to reduce levels of DBPs below regulatory requirements. By 2009 MWD plans on installing ozonation facilities at the remainder of its treatment faculties removing the percentage of SWP water that requires blending.

Other Contaminants of Concern

MWD has identified various other contaminants of concern to MWDSC water supply sources.

MTBE

As previously discussed, the use of MTBE as a gasoline oxygenate has resulted in the contamination of surface waters and groundwater. MWD operates boating facilities at its reservoirs. Therefore, these facilities were previously subjected to the introduction of MTBE. MTBE is discharged into surface water from the exhaust of recreational watercraft. MTBE and other oxygenates are regularly monitored in MWD's water supplies. Past monitoring has detected MTBE concentrations varying from non-detect to 3.9 µg/L in treatment plant effluent and up to 6.4 µg/L in source water effluent.

MWD has taken numerous actions to reduce the contamination of its supplies with MTBE including supporting state and federal legislation to reduce the impacts of MTBE. At its Diamond Valley Lake and Lake Skinner, MTBE free-fuel and clean burning engines are required to minimize the introduction of MTBE into surface waters. Water monitoring programs for MTBE and other gasoline components were instituted at the lakes. MWD has also investigated various treatment mechanisms for MTBE. Future contamination of water supplies will more than likely decrease as time elapses since the phase-out of MTBE. However, the extent of future contamination is unknown as MTBE is still within the environment.

Arsenic

Effective 2006, a federal MCL of 10 µg/L (10 parts per billion) will go into effect for domestic water supplies. MWD's water supplies contain low levels of this contaminant within the regulatory requirements. Currently, the California Office of

Environmental Health Hazard Assessment has set a public health goal of 0.004 µg/L for arsenic.

Radon
The USEPA has proposed a radon MCL of 300 pCi/L for drinking water supplies in states where there are no approved Multimedia Mitigation programs for reducing indoor radon. For states with approved programs the standard is 4,000 pCi/L. MWDSC's supplies have radon levels well below the MCL.

Uranium
Uranium is high priority with MWDSC as a 10.5 million ton pile of uranium mine tailings is 600 hundred 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 enter the River. Interim action measures instituted by the Department of Energy (DOE) include intercepting portions of the contaminated groundwater before it enters the River. Concentrations ranging from 950 to 1,190 pCi/L have been detected at the point local groundwater enters the River. At MWD's intake at the River uranium concentrations of 1 to 5 pCi/L have been detected. California has a drinking water standard for uranium of 20 pCi/L. MWD continues to monitor DOE in clean-up effort.

Emerging Contaminants
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. California notification level is 0.010 µg/L. Concentrations ranging from non-detect (reporting limit of 0.002 µg/L) to 0.012 µg/L. Action measures may be required in the future to control or remove NDMA from water supplies.

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. California has a current MCL for total chromium (includes chromium VI) of 0.05 mg/L. This level is currently under review by DHS. The California Legislature required DHS to set a MCL specifically for chromium VI by January 1, 2004. However, this has not been set at this time. MWD participates in a Technical Work Group reviewing remediation plans for chromium VI near Topock, Arizona along the Colorado River.

7.3.2 Water Quality Protection Programs

MWD participates in multiple programs to improve water quality supplies, which include:

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

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

Section 8
Water Service Reliability

8.1 Introduction

The implementation of RCWD's IRP will allow the District to meet demands over the next 45 years in a sustainable and cost-effective manner. It will also reduce the dependency on treated imported water from MWD, and help hedge against droughts and other emergencies by maximizing local groundwater.

8.2 Weather Factors

During the IRP process a statistical model using population and rainfall as explanatory variables for the period 1935-2003 was developed. The model determined that rainfall has a significant effect on annual water demands in RCWD's service area. Temperature is more likely to have an impact on monthly seasonality of water demands. Figure 8-1 illustrates weather demand factors for 1935-2003.

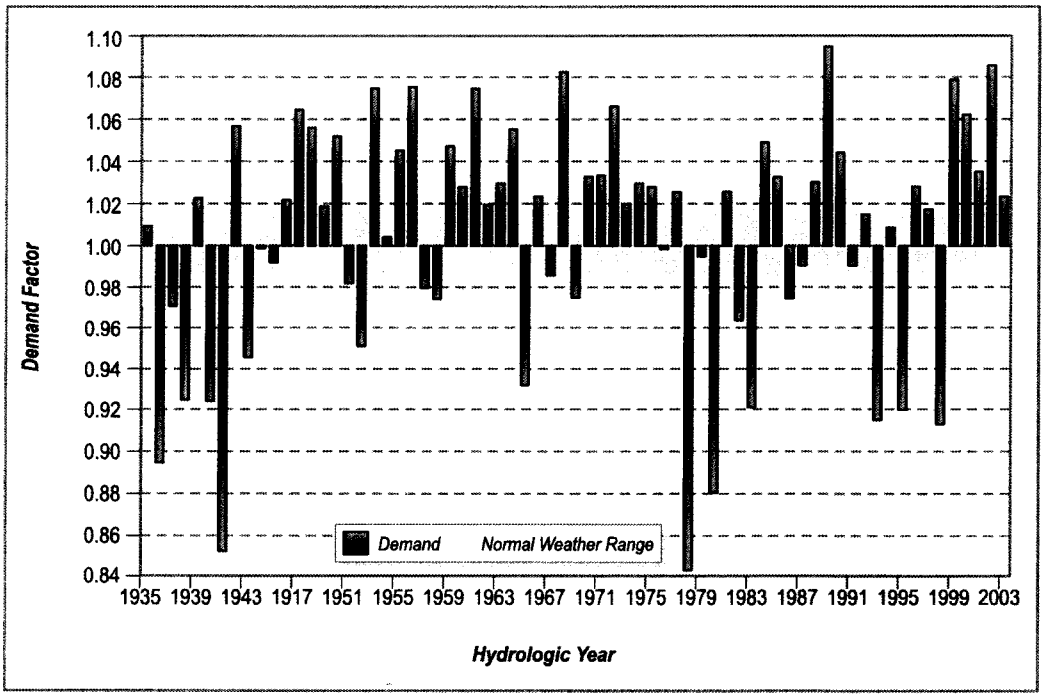

Figure 8-1
Weather Factors for RCWD Water Demands

Seasonal demands were also analyzed in the IRP using historical data from 1995-2004 Figure 8-2 shows the fluctuations on a monthly basis in demand based on agricultural and municipal and industrial water uses. The hotter drier summer months result in increased demands with reduced demands in the colder and wetter winter months.

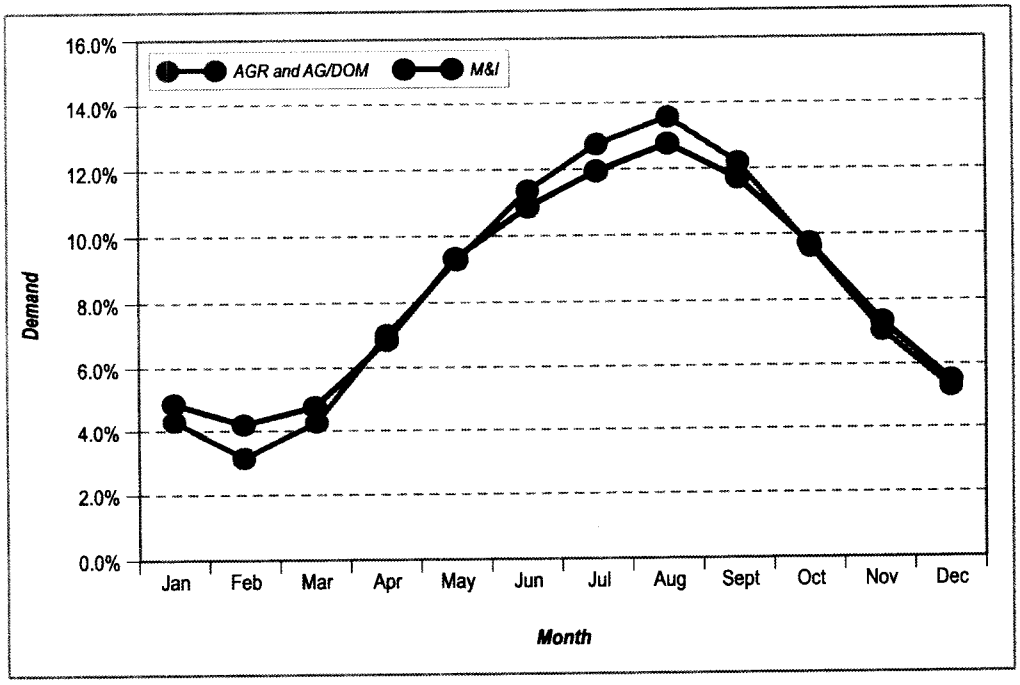

Figure 8-2
Monthly Pattern of RCWD Water Demand

8.3 Local Supply Reliability

RCWD's IRP has determined that its local supply of groundwater and recycled water is 100 percent reliable for the period extending to 2030. To minimize fluctuations in groundwater production, the IRP recommends increasing groundwater recharge with additional purchases of imported water. This increase will permit increased withdrawals of groundwater while minimizing the chance of overdraft conditions and allow for storage of excess water for use in years when natural recharge is diminished as a result of hydrologic conditions. Recycled water supplies may insignificantly fluctuate during varying hydrologic conditions as conservation increases, but these slight fluctuations will not reduce the reliability of the recycled water supply. Table 8-1 summarizes the projected local water supply mix during single-year and multiple-year droughts as a percent of a normal year supply. Normal year supplies vary and will continue to increase in the future as the population base in the service area increases requiring additional groundwater withdrawals and recycled water.

Table 8-1
Local Supply Reliability

			Multiple Dry Water Years (% of Normal)			
Source	**Normal Water Year**	**Single Dry Water Year (%of Normal)**	Year 1	Year 2	Year 3	Year 4
Groundwater	Varies (See Table 2-1 and 2-3)	100	100	100	100	100
Recycled Water	Varies (See Table 2-1 and 2-3)	100	100	100	100	100

The basis for determining normal, single-dry, and multiple-dry years is dependent upon the watershed from which the water supply is obtained. A normal water year is a year in the historical sequence that represents median runoff levels. For purposes, of the UWMP the normal year is 1954. A single-dry year is a year in the historical sequence with the lowest annual runoff for a watershed since 1903, defined as 1989 in this UWMP. A multiple-dry year period is the lowest average runoff for a consecutive multiple year period of three or more years for a watershed since 1903, which has been determined as 1987-1991 for this UWMP. Local groundwater has a different basis of water year data than imported water. Table 8-2 summarizes the basis of water year data for local groundwater. Recycled water is not reflected in the tables as recycled water supplies are not dependent upon hydrologic conditions.

Table 8-2
Local Supply Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	1954	1935-1998
Single-Dry Water Year	1989	1935-1998
Multiple-Dry Water Years	1987-1991	1935-1998

RCWD's IRP is designed to minimize any inconsistencies in its local supply sources and provide multiple flexible sources of water. Inconsistencies that could impact groundwater production include legal, environmental, water quality, and climatic conditions. Legal issues include use of the groundwater basin by other producers, the right to store water at Vail Lake for recharge outside of the current period between November 1 and April 30. Environmental issues include disposal of brine associated with construction of a microfiltration/reverse osmosis (MF/RO) recycled water facility. Water quality issues revolve around contamination of groundwater basins, potential changes to water quality standards, and the use of MF/RO water for agricultural use. Climatic conditions could result in an inconsistency in groundwater recharge by reducing available natural recharge. Table 8-3 summarizes factors that could potentially result in local supply inconsistency. Recycled water is expected to be consistent and is not included within Table 8-3. Implementation of the IRP will minimize supply inconsistencies for both local and imported water supplies. Together local and imported supplies will supplement each other dramatically reducing supply inconsistencies.

Table 8-3
Inconsistency in Local Supply Factors

Name of Supply	Legal	Environmental	Water Quality	Climatic
Groundwater	Use of groundwater basin by others. Right to store water at Valil Lake outside of November 1 to April 30 time period.	Disposal of brine from microfiltration/reverse osmosis facility.	Contamination so supply. Changes in water quality standards. Use of recycled water for agricultural use.	Drought

8.4 Imported Supply Reliability

RCWD utilizes imported water as a part of its resource mix to ensure reliability of its supply. Table 8-4 summarizes the projected imported water RCWD expects to receive from MWD via EMWD and WMWD.

Table 8-4
Agency Demand Projection Provided to Wholesale Agency (AFY)

Wholesaler	2010	2015	2020	2025	2030
MWD via EMWD and WMWD					
Treated Water	39,095	22,461	23,348	35,864	36,792
Untreated Water	25,824	23,207	26,585	19,887	18,292
Total	64,919	45,669	49,933	55,751	55,084

RCWD's imported water supply is purchased through EMWD and WMWD, but is obtained directly from MWD's facilities. As previously explained, the agency demand projections for these two wholesalers are combined to arrive at one demand on MWD. Table 8-5 illustrates MWD's existing and planned sources of water for the period 2010-2030. These numbers reflect RCWD's demands on MWD as listed in Table 8-4.

Table 8-5
MWD Current and Planned (AFY)*

	2010	2015	2020	2025	2030
Current Supplies					
Colorado River	885,700	1,042,700	1,135,200	1,142,700	1,142,700
California Aqueduct	1,396,100	1,166,100	1,140,300	1,140,300	1,140,300
In-Basin Storage	531,700	530,400	513,000	499,200	499,200
Under Development					
Colorado River	0	150,000	114,800	107,300	107,300
California Aqueduct	175,000	370,000	370,000	370,000	370,000
In-Basin Storage	89,000	200,00	200,000	200,000	200,000
Total	**3,077,500**	**3,459,200**	**3,473,300**	**3,459,500**	**3,459,500**

Source: Draft 2005 Regional Urban Water Management Plan (MWD, 2005)
Projected under a repeat of 1990-92 hydrology ending in each of the five year period

MWD has determined in its 2005 UWMP that its resource mix is 100 percent reliable for non-discounted non-interruptible demands using previous dry periods for the forecast period 2005-2030. Table 8-6 summarizes the projected imported water supply mix during single-year and multiple-year droughts as a percentage of a normal year supply. Even though MWD can reliably meet RCWD's demands, the capacity constraint issue associated with the turnouts will potentially cause future peak day water shortages after 2025. Implementation of RCWD's IRP will eliminate the capacity constraints and resolve any peak day water shortages.

Table 8-6
Imported/Wholesale Supply Reliability

		Multiple Dry Water Years (%of Normal)				
Source	Normal Water Year	Single Dry Water Year (% of Normal)	Year 1	Year 2	Year 3	Year 4
MWDSC Supplies	Varies (See Table 2-1 and 2-3	100	100	100	100	100

MWD's basis of water year data is reflected in Table 8-7.

Table 8-7
Imported/Wholesale Supply Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	Not Applicable - Determined by model	
Single-Water Year	1977	1922-1991
Multiple-Dry Water Years	1990-1992	1922-1991

RCWD relies on imported water from MWD that is classified as agricultural water (discounted, interruptible water). The portion of water considered agricultural water is subject to up to a 50 percent reduction by MWD during dry weather or emergencies. Agricultural customers could experience a shortage of up to 4,000 AFY with implementation of the IRP in the eastern service area unless dry year water transfers are implemented by RCWD as discussed under section 2.2.4.

MWD has developed an IRP to manage its water supplies and minimize any inconsistency in its supplies. Factors that may cause an inconsistency in MWD's supplies are listed in Table 8-8.

Table 8-8
Inconsistency in Wholesaler/Imported Supply Factors

Name of Supply	Legal	Environmental	Water Quality	Climatic
MWDSC Imported	Competition for new supplies	Endangered species	Contamination of supply. More stringent water quality standards	Drought Conditions

MWD has identified contamination of its water supplies and the implementation of more stringent water quality standards in its 2005 UWMP as having the possibility of causing an inconsistency in supplies. Development of new supplies could be reduced as a result of the competitive nature of obtaining new supplies. Endangered species may impact imported supplies by requiring minimum flows in waterways or other measures that may reduce flows. Droughts are unpredictable and may reduce available supplies from areas such as the Colorado River Basin

and the Bay-Delta even if local climatic conditions are normal. Through implementation of the IRP, MWD has developed and identified a plethora of resources and measures to counteract any inconsistency in supplies.

8.5 RCWD Service Reliability

Overall, during single-dry and multiple-dry years RCWD's combined local and imported resource mix is 100 percent reliable for non-agricultural customers with implementation of RCWD's IRP. RCWD's IRP delineated supply sources are flexible and designed to supplement each other if one source is reduced. With implementation of the Hybrid 1 alternative of RCWD's IRP, peak day water shortages associated with imported treated water will be eliminated. Additionally, RCWD's IRP calls for increased utilization of recycled water, a relatively drought proof water supply that is consistent regardless of seasonal or climatic variations.

8.5.1 Normal Water Year

During normal water years throughout the projection period between 2010 and 2005, RCWD's resource mix is 100 percent reliable (see Table 8-9). All forecasted demands throughout the projection period are expected to be met with the resource mix identified in RCWD's IRP.

Table 8-9
Service Area Reliability Assessment for Normal Water Year (AFY)

	2010	2015	2020	2025	2030
Total Demand [1]	100,700	108,000	124,400	132,900	140,400
Percent of Year 2005	108%	116%	134%	143%	151%
Total Supply	100,700	108,000	124,400	132,900	140,400
Percent of Year 2005	108%	116%	134%	143%	151%
Difference (Supply minus Demand)	0	0	0	0	0
Difference as a Percent of Supply	0%	0%	0%	0%	0%
Difference as a Percent of Demand	0%	0%	0%	0%	0%

[1] Includes consumptive demand, imported water for groundwater recharge, and unaccounted use

8.5.2 Single - Dry Water Year

Using the single-driest year of 1989, projections of water demands were compared to projected supplies for the period 2010 to 2030 (see Table 8-10). Throughout the projection period, RCWD's water resource mix remains reliable. During dry years, it is expected that demands would increase approximately 7 to 8 percent over the normal year period (Table 8-9 demands) due to hotter and drier weather. Supplies are also expected to increase by approximately 7 to 8 percent over the normal year period to meet demands.

Table 8-10
Service Area Reliability Assessment for Single Dry Year (AFY)

	2010	2015	2020	2025	2030
Total Demand	108,215	116,163	133,130	142,377	150,543
Percent of Projected Normal	107%	108%	107%	107%	107%
Total Supply	108,215	116,163	133,130	142,377	150,543
Percent of Projected Normal	107%	108%	107%	107%	107%
Difference (Supply minus Demand)	0	0	0	0	0
Difference as a Percent of Supply	0%	0%	0%	0%	0%
Difference as a Percent of Demand	0%	0%	0%	0%	0%

8.5.3 Multiple Dry Water Years

To determine the reliability of RCWD's water resource mix under a multi-year drought scenario the 1987-1991 drought period was used as a hydrologic base year to obtain supply and demand forecasts in five year intervals. Each five-year increment (e.g. 2006-2010) assumes the same multiple dry year period condition.

During the 1990 and 1991 drought years MWD curtailed imported water deliveries for agriculture. Therefore, if this hydrologic period was repeated in the future, RCWD could expect shortages for its agricultural customers. Reliability increases in the latter years of the projection period when planned improvements are constructed such as the MF/RO facility that would supply recycled water to agricultural users. Additionally, water transfers and potential agriculture conservation measures could reduce the potential agricultural water shortages.

Tables 8-11 through 8-15 summarize the reliability under multiple dry years.

Table 8-11
Service Area Reliability Assessment for Multiple Dry Years (AFY)

	2006	2007	2008	2009	2010
Total Demand	93,863	98,501	105,269	102,758	99,864
Percent of Projected Normal	99%	102%	108%	104%	99%
Total Supply	93,863	98,501	105,269	99,675	93,872
Percent of Projected Normal	99%	102%	108%	100%	93%
Difference (Supply minus Demand)	0	0	0	-3,083	-5,992
Difference as a Percent of Supply	0%	0%	0%	-3%	-6%
Difference as a Percent of Demand	0%	0%	0%	-3%	-6%

Note: Supply shortages in 2009 and 2010 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-12
Service Area Reliability Assessment for Multiple-Dry Years (AFY))

	2011	2012	2013	2014	2015
Total Demand	101,332	106,200	113,376	110,434	107,092
Percent of Projected Normal	99%	102%	108%	104%	99%
Total Supply	101,332	106,200	113,376	106,016	98,524
Percent of Projected Normal	99%	102%	108%	100%	91%
Difference (Supply minus Demand)	0	0	0	-4,417	-8,567
Difference as a Percent of Supply	0%	0%	0%	-4%	-9%
Difference as a Percent of Demand	0%	0%	0%	-4%	-8%

Note: Supply shortages in 2014 and 2015 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-13
Service Area Reliability Assessment for Multiple-Dry Years (AFY)

	2016	2017	2018	2019	2020
Total Demand	108,563	114,004	121,906	120,436	123,429
Percent of Projected Normal	99%	103%	108%	104%	99%
Total Supply	108,563	114,004	121,906	115,619	113,554
Percent of Projected Normal	99%	103%	108%	99%	91%
Difference (Supply minus Demand)	0	0	0	-4,817	-9,874
Difference as a Percent of Supply	0%	0%	0%	-4%	-9%
Difference as a Percent of Demand	0%	0%	0%	-4%	-8%

Note: Supply shortages in 2019 and 2020 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-14
Service Area Reliability Assessment for Multiple-Dry Years (AFY)

	2021	2022	2023	2024	2025
Total Demand	125,138	130,796	139,134	135,721	131,845
Percent of Projected Normal	99%	102%	107%	103%	99%
Total Supply	125,138	130,796	139,134	130,292	121,298
Percent of Projected Normal	99%	102%	107%	99%	91%
Difference (Supply minus Demand)	0	0	0	-5,429	-10,548
Difference as a Percent of Supply	0%	0%	0%	-4%	-9%
Difference as a Percent of Demand	0%	0%	0%	-4%	-8%

Note: Supply shortages in 2024 and 2025 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-15
Service Area Reliability Assessment for Multiple Dry Years (AFY)

	2026	2027	2028	2029	2030
Total Demand	133,359	139,133	147,767	143,752	139,271
Percent of Projected Normal	99%	102%	108%	103%	99%
Total Supply	133,359	139,133	147,767	140,877	133,701
Percent of Projected Normal	99%	102%	108%	101%	95%
Difference (Supply minus Demand)	0	0	0	-2,875	-5,571
Difference as a Percent of Supply	0%	0%	0%	-2%	-4%
Difference as a Percent of Demand	0%	0%	0%	-2%	-4%
Note: Supply shortages in 2029 and 2030 are due to anticipated reductions in MWD's agricultural deliveries.					

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Section 9
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Appendix A
Water Rate Schedules

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RATES & FEE SCHEDULES

RANCHO DIVISION WATER & ENERGY RATES						
COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$0.6107**	**$0.5482**	**$0.6287**	**$0.5587**	**2.9%**	**1.9%**
Projected Rate by Pump Zone in HCF (Includes Commodity+Energy Rates)						
1305	$0.6966	$0.6340	$0.7155	$0.6455	2.7%	1.8%
1380	$0.7286	$0.6660	$0.7485	$0.6785	2.7%	1.9%
1485	$0.7733	$0.7107	$0.7947	$0.7247	2.8%	2.0%
1550	$0.8010	$0.7384	$0.8233	$0.7533	2.8%	2.0%
1610	$0.8265	$0.7639	$0.8497	$0.7797	2.8%	2.1%
1790	$0.9032	$0.8406	$0.9289	$0.8589	2.8%	2.2%
1880	$1.0224	$0.9599	$1.0521	$0.9821	2.9%	2.3%
2070	$1.0224	$0.9599	$1.0521	$0.9821	2.9%	2.3%
2350	$1.1417	$1.0791	$1.1753	$1.1053	2.9%	2.4%
TOTAL WEIGHTED AVERAGE RATE IMPACT:					**2.8%**	**2.0%**

COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$266.03**	**$238.78**	**$273.84**	**$243.35**	**2.9%**	**1.9%**
Projected Rate by Pump Zone Per Acre Foot (Includes Commodity+Energy Rates)						
1305	$303.45	$276.19	$311.68	$281.19	2.7%	1.8%
1380	$317.36	$290.10	$326.06	$295.57	2.7%	1.9%
1485	$336.84	$309.59	$346.18	$315.69	2.8%	2.0%
1550	$348.90	$321.64	$358.64	$328.15	2.8%	2.0%
1610	$360.03	$332.78	$370.14	$339.65	2.8%	2.1%
1790	$393.43	$366.17	$404.64	$374.15	2.8%	2.2%
1880	$445.38	$418.12	$458.31	$427.82	2.9%	2.3%
2070	$445.38	$418.12	$458.31	$427.82	2.9%	2.3%
2350	$497.32	$470.07	$511.97	$481.48	2.9%	2.4%
TOTAL WEIGHTED AVERAGE RATE IMPACT:					**2.8%**	**2.0%**

RATES & FEE SCHEDULES

SANTA ROSA DIVISION WATER & ENERGY RATES						
COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$1.0167**	**$0.7730**	**$1.02811**	**$0.7967**	**1.1%**	**3.1%**
Projected Rate by Pump Zone in HCF (Includes Commodity + Energy Rates)						
1305	$1.0754	$0.8316	$1.0870	$0.8556	1.1%	2.9%
1434	$1.1219	$0.8781	$1.1309	$0.8995	0.8%	2.4%
1440	$1.1241	$0.8803	$1.1329	$0.9015	0.8%	2.4%
1500	$1.1457	$0.9020	$1.1533	$0.9219	0.7%	2.2%
1670	$1.2071	$0.9633	$1.2111	$0.9797	0.3%	1.7%
1990	$1.3225	$1.0788	$1.3199	$1.0885	-0.2%	0.9%
2160	$1.3839	$1.1401	$1.3777	$1.1463	-0.4%	0.5%
2260	$1.4199	$1.1762	$1.4117	$1.1803	-0.6%	0.4%
2550	$1.5246	$1.2808	$1.5103	$1.2789	-0.9%	-0.1%
2850	$1.6328	$1.3890	$1.6123	$1.3809	-1.3%	-0.6%
TOTAL WEIGHTED AVERAGE RATE IMPACT					0.3%	1.7%

COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$442.89**	**$336.70**	**$447.85**	**$347.05**	**1.1%**	**3.1%**
Projected Rate by Pump Zone Per Acre Foot (Includes Commodity+Energy Rates)						
1305	$468.43	$362.25	$473.51	$372.71	1.1%	2.9%
1434	$488.71	$382.52	$492.61	$391.82	0.8%	2.4%
1440	$489.65	$383.46	$493.50	$392.71	0.8%	2.4%
1500	$499.08	$392.89	$502.39	$401.59	0.7%	2.2%
1670	$525.80	$419.61	$527.56	$426.77	0.3%	1.7%
1990	$576.09	$469.90	$574.96	$474.16	-0.2%	0.9%
2160	$602.81	$496.62	$600.13	$499.34	-0.4%	0.5%
2260	$618.53	$512.34	$614.95	$514.15	-0.6%	0.4%
2550	$664.11	$557.92	$657.90	$557.10	-0.9%	-0.1%
2850	$711.26	$605.07	$702.33	$601.53	-1.3%	-0.6%
TOTAL WEIGHTED AVERAGE RATE IMPACT					0.3%	1.7%

RATES & FEE SCHEDULES

MONTHLY CAPACITY FEES						
Meter Size	2004-2005 Rate		2005-2006 Rate		% of Increase	
	Rancho	Santa Rosa	Rancho	Santa Rosa	Rancho	Santa Rosa
3/4"	$12.10	$18.71	$12.71	$19.65	5%	5%
1"	$17.92	$33.59	$18.82	$35.27	5%	5%
1-1/2"	$30.56	$54.67	$32.09	$57.40	5%	5%
2"	$46.08	$86.15	$48.38	$90.46	5%	5%
2-1/2"	$68.96	$121.05	$72.41	$127.10	5%	5%
3"	$121.12	$189.92	$127.18	$199.42	5%	5%
4"	$273.03	$474.77	$286.68	$498.51	5%	5%
6"	$466.39	$780.17	$489.71	$819.18	5%	5%
8"	$715.92	$1,078.58	$751.52	$1,132.51	5%	5%

CONSTRUCTION & NON-POTABLE WATER RATES (Base Water Rates Per HCF)				
	RANCHO DIVISION		SANTA ROSA DIVISION	
Description	FY 2004-2005	FY 2005-2006	FY 2004-2005	FY 2005-2006
Construction Water	$2.019/HCF*	$2.019/HCF*	$2.019/HCF*	$2.019/HCF*
Tier 2 Annex Rate	$1.12/HCF	$1.2029/HCF	$1.12/HCF	$1.2029/HCF
Recycled Construction Water	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge
Tertiary Treated	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge
Agricultural	$69.42/AF + $10 Monthly Service Charge*	$71.50/AF + $10 Monthly Service Charge	$69.42/AF + $10 Monthly Service Charge*	$71.50/AF + $10 Monthly Service Charge

*Customers will be charged the appropriate pump zones' energy rates in addition to the base rate.

FEE FOR SERVICE SCHEDULE		
	DESCRIPTION OF SERVICE	FEE/DEPOSIT
1	**Will Serve Letters**	
	Single letter	$90.00
	Tract/Parcel map initiation	$150.00
	Fire Hydrant Location Fee	$150.00
2	Request for Secondary Line Extension (Cost Estimate New)	$1,370.00
3	CFD/Assessment District (Processing Fee) [Deposit]	$10,000.00
	Assessment District Pay-Off Administrative Fee	$25.00
4	Request for RCWD Participation in Joint Community Facilities Financing Agreement (JCFA) (Processing Fee) [Deposit]	$5,000.00
5	Annexation Processing Fee	$3,995.00
6	Annexation Acreage Fee	
	Rancho Division	$1,731.00
	Santa Rosa Division	$1,674.00
7	Temporary Remote Meter Request (Cost Estimate Update)	$264.00
8	Fire Hydrant Meter Deposit (4-inch)	$750.00
9	Construction Meter Deposit (4-inch)	$1,500.00
10	Construction Meter Deposit (6-inch)	$3,000.00
11	Construction Meter Relocation	$23.00
12	Meter Test Requests (3/4-inch to 2-inch)	$50.00
13	Meter Test Requests (3-inch and larger)	$100.00
14	Floating Meter "No Read" Penalty	$100.00
15	Construction Meter Location Penalty	$150.00
16	Unmetered Water Accounts	$52.00
17	Meter Obstruction Charge	$77.00
18	Meter Relocation Deposit (3/4-inch to 2-inch)	$2,000.00
19	Meter Downsize Deposit (3/4-inch to 2-inch MJ and Turbo)	$1,300.00
20	**Drop-In Meter Installations**	
	Meter w/Double Checks	
	¾-inch MJ-Single	$288.00
	¾-inch MJ-Multiple	$164.00
	1-inch MJ	$446.00
	1-1/2-inch MJ	$822.00
	2-inch MJ	$1,057.00
	2-inch Turbo	$1,150.00
	Meter w/Pressure Regulator and Double Checks	
	¾-inch MJ-Single	$411.00
	¾-inch MJ-Multiple	$288.00
	1-inch MJ	$592.00