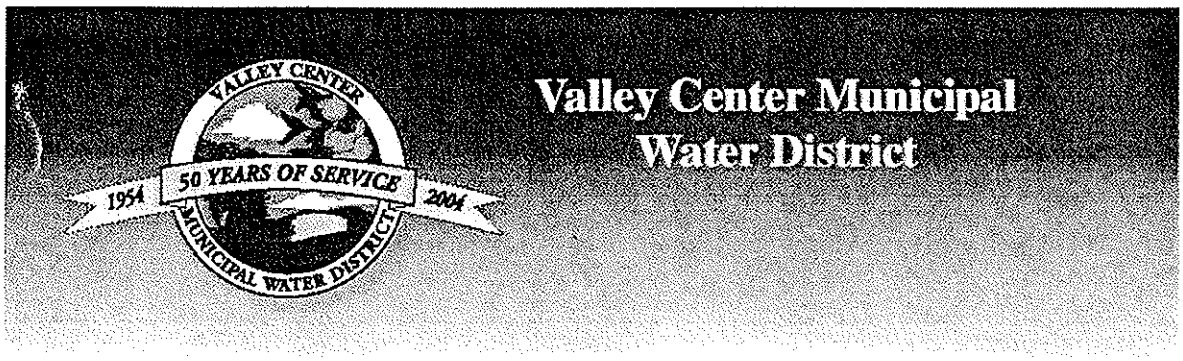

URBAN WATER MANAGEMENT PLAN

FEBRUARY 2006

BROWN AND CALDWELL

Suite 201, 9665 Chesapeake Drive
San Diego, California 92123

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APPENDIX C VCMWD'S 2004 WATER QUALITY REPORT

APPENDIX D 2003-2004 BMP ACTIVITY REPORTS

APPENDIX E VCMWD'S REGULATIONS AND CODES

ACRONYMS

AB 3616	Agricultural Efficient Water Management Memorandum of Understanding
ac-ft/yr	acre/feet per year
BMP	Best Management Practice
CAFR	Comprehensive Annual Financial Report
CALFED	CALFED Bay Delta Authority
cfs	Cubic feet per second
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
DMP	Drought Management Plan
DPLU	San Diego County Department of Planning and Land Use
DWR	California Department of Water Resources
EDU	Equivalent Dwelling Unit
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
ERP	Emergency Response plan
ESP	Emergency Storage Project
ETo	Evapotranspiration
EWA	Environmental Water Account
IAWP	Interruptible Agricultural Water Program
IRP	Integrated Resources Plan
M&I	Manufacturing and Industrial
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
mg/L	milligrams per liter
MAIN	Municipal and Industrial Needs
MWD	Metropolitan Water District
RCD	Resource Conservation District
RFP	Request for Proposal
RUWMP	Regional Urban Water Management Plan
RWFMP	Regional Water Facilities Master Plan
SANDAG	San Diego Association of Governments
SCCWRRS	Southern California Comprehensive Water Reclamation and Reuse Study
SDCWA	San Diego County Water Authority
SRF	State Revolving Fund
SWP	State Water Project
TDS	total dissolved solids
WLRP	Water Reclamation Loan Program
WSDM Plan	Water Surplus and Drought Management Plan
VCMWD	Valley Center Municipal Water District

EXECUTIVE SUMMARY

The following Urban Water Management Plan (Plan) was prepared for the Valley Center Municipal Water District (District, VCMWD). The Plan Update primarily addresses the urban component (i.e., residential, commercial, and public). For completeness, this report also provides some background information on agricultural conservation efforts.

While preparing the 2005 Plan, the District coordinated its efforts with several other entities to ensure that data and issues were presented accurately. The District also coordinated with the San Diego County Water Authority (SDCWA) regarding projected imported water deliveries. The District's Plan was sent to the SDCWA, San Diego County Department of Planning and Land Use (DPLU), and the City of Escondido requesting the agencies' review and comments on the document.

This report is the formal document to satisfy the year 2005 updating requirements of the Act. This 2005 Plan describes the availability of water and discusses water use, reclamation, and water conservation activities. The Plan concludes that the water supplies available to the District's customers are adequate over the next 20-year planning period through 2025.

CHAPTER 1

INTRODUCTION

This Plan has been prepared for the District. This Plan update is the year 2005 Urban Water Management Plan as required by the Urban Water Management Planning Act (Act) (California Water Code Division 6, Part 2.6, Sections 10610 through 10657).

It should be noted that the Plan Update is primarily for the urban component, i.e., residential, commercial, and public. As a signatory to the Agricultural Efficient Water Management Memorandum of Understanding (AB 3616), agricultural water management issues and practices are covered in more detail in the Agricultural Water Management Plan. However, for completeness, this report does provide some background information on the agricultural conservation efforts.

The remainder of this chapter provides an overview of the Act, public participation, agency coordination, as well as resource maximization and water conservation efforts.

1.1 Urban Water Management Planning Act

The Act became part of the California Water Code with the passage of Assembly Bill 797 during the 1983–1984 regular session of the California legislature. Subsequently, assembly bills between 1990 and 2003 amended the Act. Most recently the Act was amended on January 1, 2003 by Assembly Bill 105. The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to adopt and submit an Urban Water Management Plan every five years to the California Department of Water Resources (DWR). According to DWR, the Act states that these urban water suppliers should make every effort to assure the appropriate level of reliability in its water service is sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Act describes the contents of the Plan as well as how urban water suppliers should adopt and implement the Plan. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the number of customers served and the volume of water supplied.

This report is the formal document to satisfy the year 2005 updating requirements of the Act. This 2005 Plan describes the availability of water and discusses water use, reclamation, and water conservation activities. The Plan concludes that the water supplies available to the District's customers are adequate over the next 20-year planning period.

The recent Senate Bill 1087 requires the Agency to adopt written policies and procedures "not later than July 1, 2006," containing specific objective standards for providing services to lower income households. Such policies and procedures are to take into account the availability of water supplies as determined by the Agency in its urban water management plan. The Agency intends to adopt policies and procedures prior to July 2006.

1.2 Public Participation

The Act requires the encouragement of public participation and a public hearing as part of the Plan approval process. As required by the Act, prior to adopting this Plan, the District made the Plan available for public inspection and held a public hearing. This hearing provided an opportunity for District's customers including social, cultural, and economic community groups to learn about the water supply situation and the plans for providing a reliable, safe, high-quality water supply for the future. The hearing was an opportunity for people to ask questions regarding the current situation and the viability of future plans.

A Notice of Public Hearing was published twice in the local Valley Center Roadrunner newspaper to notify all customers and local government agencies of the public hearing and copies of the Plan were made available for public inspection at the District's Administrative Offices as well as the Valley Center Public Library. A copy of the published Public comments regarding the report are also included in Appendix A. This Plan was adopted by the District's Board of Directors on January 17, 2006. A copy of the adopted resolution is provided in Appendix B. The adopted plan will be provided to DWR and the appropriate cities and counties within 30 days of adoption.

1.3 Agency Coordination

The Act requires the District to coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. While preparing the 2005 Plan, the District coordinated its efforts with several other entities to ensure that data and issues were presented accurately. The District also coordinated with the SDCWA regarding projected imported water deliveries. The District's Plan was sent to the SDCWA, DPLU, and the City of Escondido requesting the agencies' review and comments on the document. Table 1-1 provides a summary of the plan coordination with the appropriate agencies.

Table 1-1. Coordination with Appropriate Agencies (DWR Table 1)

Coordination	SDCWA	City of Escondido	DPLU
Participated in developing the plan	X		
Provided opportunity for comment	X	X	X
Commented on the draft			
Attended public meetings			
Was contacted for assistance	X		
Was sent a copy of the plan	X	X	X
Was sent a notice of intention to adopt	X	X	X
Not Involved / No Information			

1.4 Resource Maximization

Water management tools have been used by the District to maximize water resources. Programs in which the District participates to maximize water resources are described as follows.

- California Urban Water Conservation Council (CUWCC) – The District is a participant in the CUWCC. The CUWCC was created to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations, and private entities. The CUWCC's goal is to integrate urban water conservation Best Management Practices (BMPs) into the planning and management of California's water resources. A historic Memorandum of Understanding was signed by nearly 100 urban water agencies and environmental groups in December, 1991. Since then the Council has grown to 345 members, including the District. Those signing the MOU pledge to develop and implement fourteen comprehensive conservation BMPs.

- Agricultural Water Audit Program – The District participates in this program through the Mission Resource Conservation District (RCD). The RCD mobilizes staff to add pressure regulators to balance pressure throughout the system. Grove irrigation systems are also inspected.

- University of California – Davis Extension Program – The District is participating in the Pulse Irrigation Research Sensor Program, which uses pulse sensors to determine water needs based on soil moisture content.

The benefits of the program described above and the documents developed as a result of these programs are water management tools that the District uses to maximize their available water resources.

CHAPTER 2

DESCRIPTION OF EXISTING WATER SYSTEM

This chapter describes the District's system. It contains a description of the service area and its climate. This section also describes the water supply facilities, including the surface water supply facilities, booster pumping stations, reservoirs, and the piping system.

2.1 Description of Service Area

The District covers an area of approximately 100 square miles of which approximately 58 percent receives water service. The District imports 100 percent of its water from the SDCWA. The District now ranks as SDCWA's second largest water customer, and as of June 30, 2005, serves 9,217 active water meters (including 624 residential fire protection meters) for a net 8,593 active water service accounts. The District is also the largest retail purchaser of agricultural water within SDCWA's service area.

The District also provides sanitary sewer service for 2,685 customers through two sewage treatment facilities: the 25,000 gallon per day Skyline Ranch Plant located on Paradise Mountain, the 450,000 gallon per day Lower Moosa Canyon Water Reclamation Facility at Circle R Drive near Old Highway 395, and the 70,000 gallon per day Woods Valley Ranch Water Reclamation Facility.

In its peak year (2003-04), VCMWD sold 49,336 acre feet of water with 86 percent being delivered to agricultural users. Water sales were considerably lower in 2004-05 (36,090 acre feet) due to decreased water deliveries caused by an increase in rainfall during the year.

According to the June 30, 2005 Comprehensive Annual Financial Report (CAFR), the estimated District population is currently 24,802 and is projected to grow to 33,613 by 2020. Present District boundaries, which define the study area for this Plan, are shown on Figures 2-1 and 2-2.

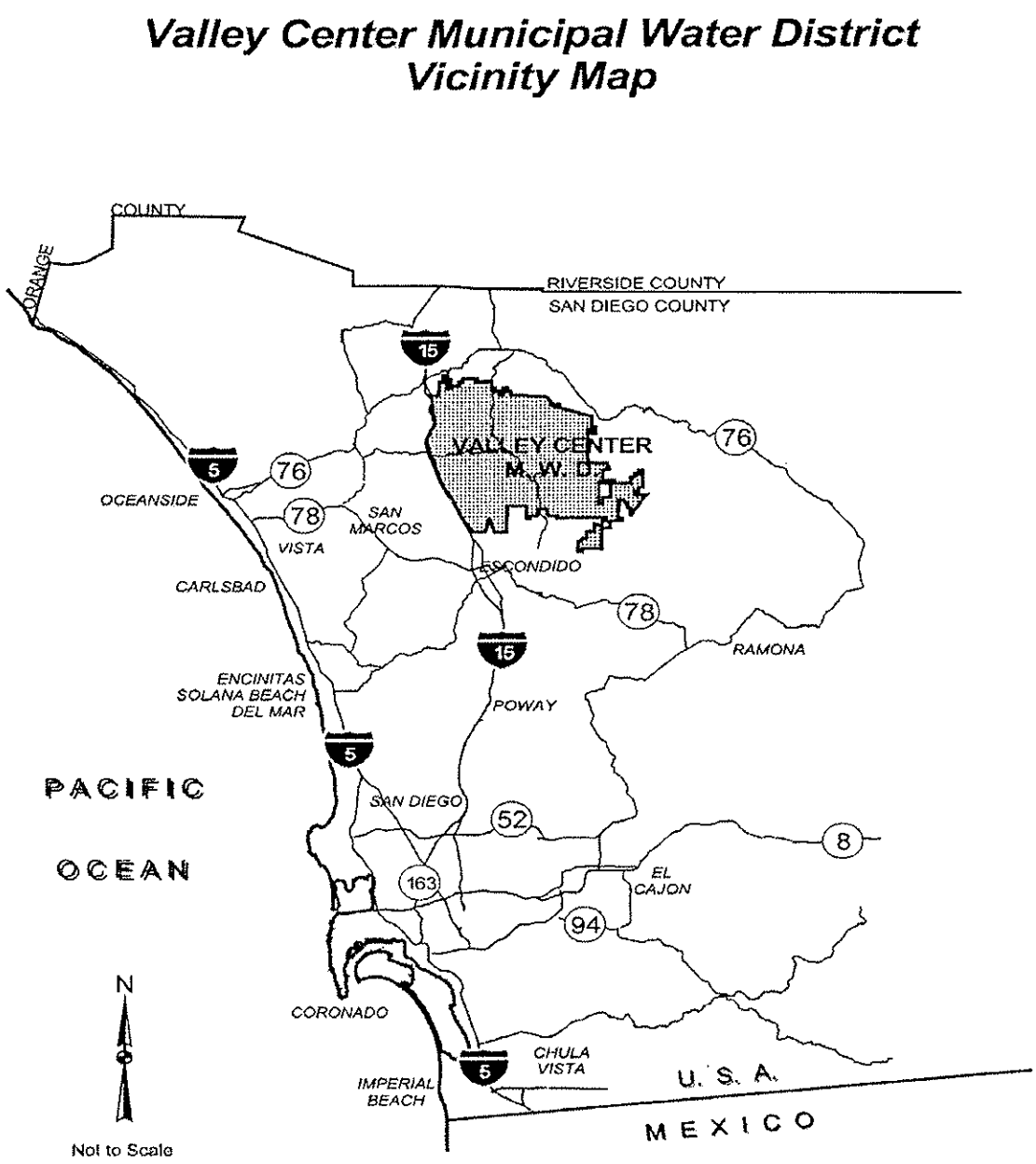


Figure 2-1. VCMWD Vicinity Map
Source: VCMWD

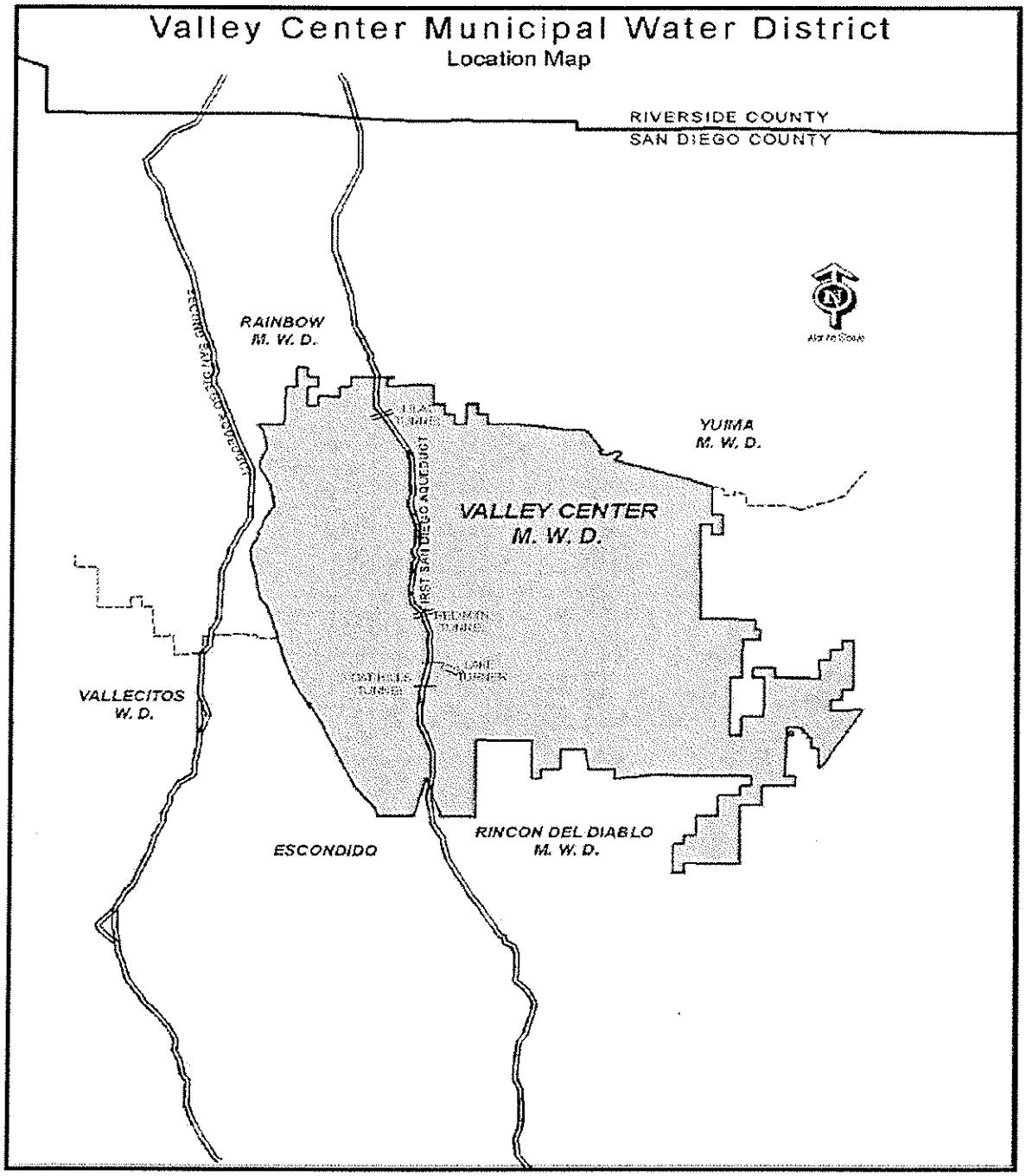


Figure 2-2. Location Map
Source: VCMWD

Agricultural acreage use is predicted to decline by approximately 35 percent over the next 20 years, offset by significant increases in land utilized for Low Density Single Family housing as well as typical Single Family housing (San Diego Association of Governments [SANDAG]).

2.2 Local Climate

Valley Center is a semi-arid area characterized by hot dry summers and mild winters, although temperatures do occasionally fall below freezing. A typical summer month's high temperatures average from the low to mid 90 degrees Fahrenheit range. Over the last 20 years, rainfall has averaged around 14 inches per year. Following the 1986-91 drought, the area received significantly higher than average rainfall in 1993, 1995, and 1998. The 2004/05 wet season also brought significant amounts of rain. Table 2-1 contains the annual precipitation as reported from a weather station located in Escondido, California, and compiled by the Western Region Climate Center. Average envapotranspiration (ETo) data was obtained from the CIMIS website.

Table 2-1. Valley Center Municipal Water District
Precipitation and Temperature Records, 1999-2005 (DWR Table 3)

Year	Average Temperature (F)	Rainfall (inches)	Standard Yearly Average ETo
2005	66.23	17.42	4.58
2004	60.48	14.49	4.69
2003	62.82	13.00	4.47
2002	63.84	5.83	4.63
2001	65.11	11.68	4.32
2000	65.99	4.81	4.32
1999	63.75	6.62	4.73

2.3 Water Supply Facilities

The District currently relies entirely on imported water via the SDCWA Aqueducts. A supply of imported water will continue to be the District's principal water source. Other water sources in the District, specifically groundwater, are small in magnitude and are currently being utilized to nearly their fullest extent practicable by private landowners. Reclaimed water is currently used to recharge the groundwater basin in the Lower Moosa Canyon Creek west of Interstate 15. Limited reclaimed water use is projected as part of localized wastewater treatment projects for new developments (Water Master Plan 2002). This section describes the District's groundwater and surface water facilities.

2.3.1 Groundwater Facilities

Groundwater in the District service area originates from alluvial deposits and fractured bedrock of the Moosa Basin, which is a portion of the Bonsall Hydrographic Subunit. The Moosa Basin is predominately underlain by the Woodson Mountain Granodiorite and to a lesser degree by volcanic and metavolcanic rocks. Some groundwater is derived from alluvium of the San Luis Rey River or more specifically, the Pauma Basin located along the northeastern perimeter of the District. Only a small portion of the Pauma Basin is located within District boundaries and groundwater from this basin is currently being utilized by private entities for agricultural and turf irrigation (Water Master Plan 2002). The District's 1994 Water Master Plan concluded that groundwater from alluvial sources was insignificant in quantity. The District has constructed two groundwater wells in the fractured bedrock surrounding the Lake Turner Reservoir (a 1,600 acre-feet open reservoir). These wells have exhibited dissolved solids concentrations of 400 to 750 milligrams per liter (mg/l). Should these wells be treated to potable water standards, up to 560 acre-feet of potable water could be produced annually. Although the District is planning to further investigate the feasibility of additional groundwater extractions, well water is not anticipated to be a substantial part of the near future water supply.

2.3.2 Surface Water Facilities

Approximately 400 acre-feet of incidental surface water runoff is collected annually in Lake Turner Reservoir. Due to quality concerns and the lack of surface water treatment capability; however, Lake Turner water is currently being utilized as emergency supply only.

2.3.3 Water Purchases

As stated previously, VCMWD imports nearly all of its water. The water originates from both the Colorado River and the State Water Project sources in northern California. The District purchases the water through the SDCWA and MWD. Table 2-2 shows annual acre-feet of water purchased over the past twenty years.

Table 2-2. Acre-Feet of Water Purchased by VCMWD, 1985-2004

Fiscal Year Ending	Acre-Feet
1985	38,953
1986	41,055
1987	43,511
1988	39,937
1989	47,105
1990	52,535
1991	50,354
1992	38,288
1993	39,514
1994	33,799
1995	30,726
1996	38,822
1997	38,744
1998	29,201
1999	39,195
2000	48,550
2001	44,598
2002	49,524
2003	43,674
2004	52,182

Source: Valley Center Municipal Water District 2005-2006 Budget

2.4 Distribution System

VCMWD maintains $94.5 million of total fixed assets necessary to serve the growing and changing needs of its constituents. Table 2-3 below provides detail of each of the facilities maintained by the District.

Table 2-3. VCMWD Water System Selected Information

Information	Capacity
Service Area	100 square miles
Miles of Water Main (8" & larger)	289
Number of Closed Reservoirs	41
Maximum Closed Reservoir Capacity	415 acre feet
Number of Open Reservoirs*	1
Maximum Capacity of Open Reservoir	1,612 acre-feet
Number of Meters in Service**	9,217
Number of Pump Stations	26
Number of Pumps	96

*Open reservoir used for storage of non-potable water only

** Includes 624 residential fire service meters

Source – June 30, 2005 CAFR and VCMWD 2005-2006 Budget

This section discusses the District's distribution system, including storage, pump stations, and interconnections. As a result of steeply varying topography, the District's water distribution system is hydraulically divided into 18 pressure zones, the general boundaries of which are shown on Figure 2-3. Within the pressure zones are 11 pressure regulated areas, as shown on Figure 2-4. The system includes over 289 miles of pipe ranging in size from 8 inches to 42 inches in diameter. Within these pressure zones, the District currently operates a total of 41 storage facilities (ranging in size from 100,000 gallons to 55.9 million gallons), 26 pump stations, 22 pressure-reducing stations, and one hydropneumatic tank to meet the needs of their customers. VCMWD water and sewer systems are shown on Figure 2-5.

There are a substantial number of interconnections and a high degree of interdependency between most of the zones. For example, the Paradise Mountain zone, which is connected directly to the Cool Valley Zone at the Paradise Mountain Pump Station, is typically served by aqueduct connections VC No. 5 and VC No. 6 via the Mizpah Zone. However, it could also be served from VC. No. 1-B via the Lilac Zone, or more indirectly from VC No. 4 and VC No. 7 via the West Zone. This degree of flexibility is useful in that it provides the ability to handle a variety of supply and demand situations.

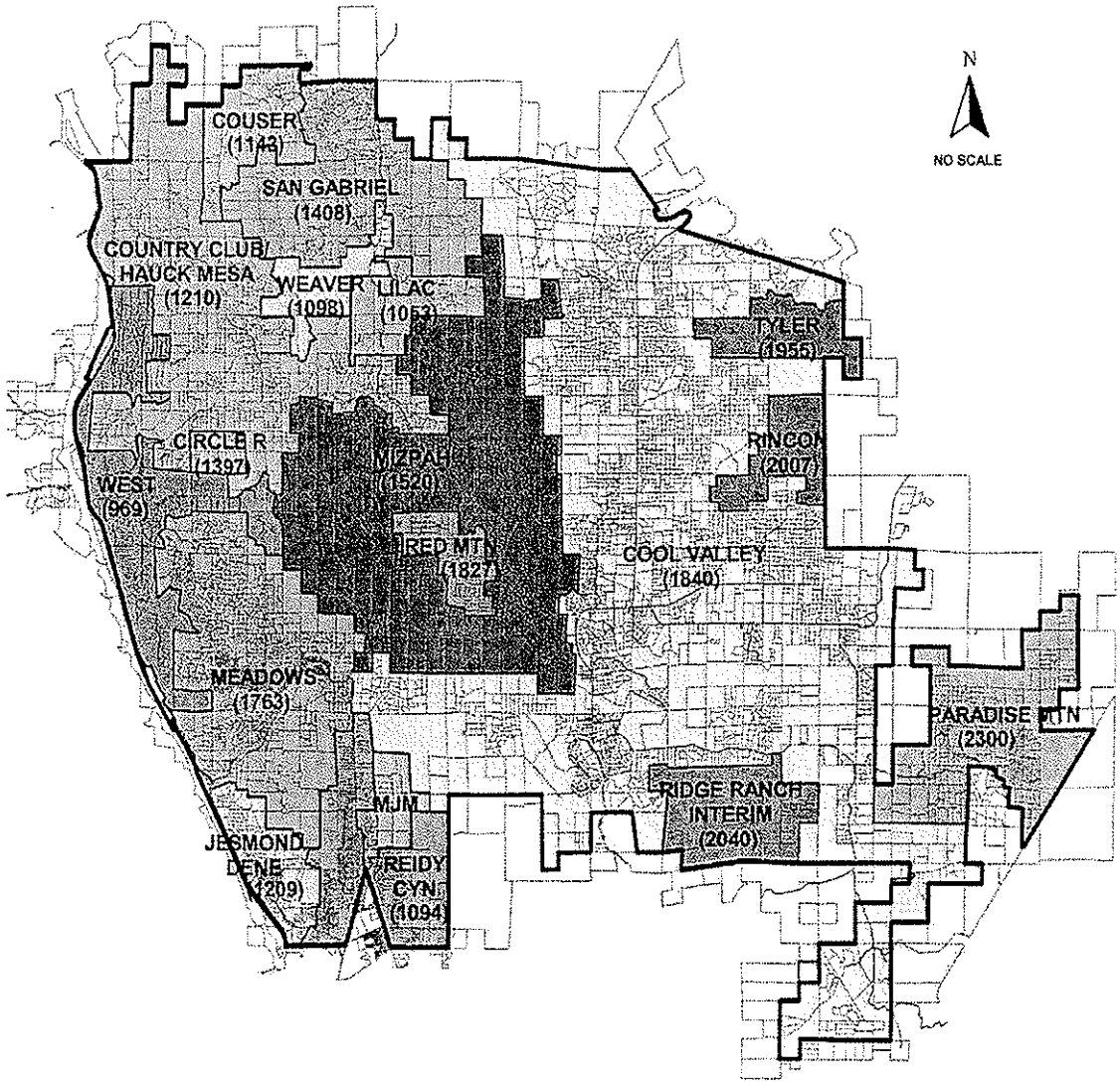


Figure 2-3. General Boundaries of 18 Pressure Zones
Source: VCMWD Water Master Plan

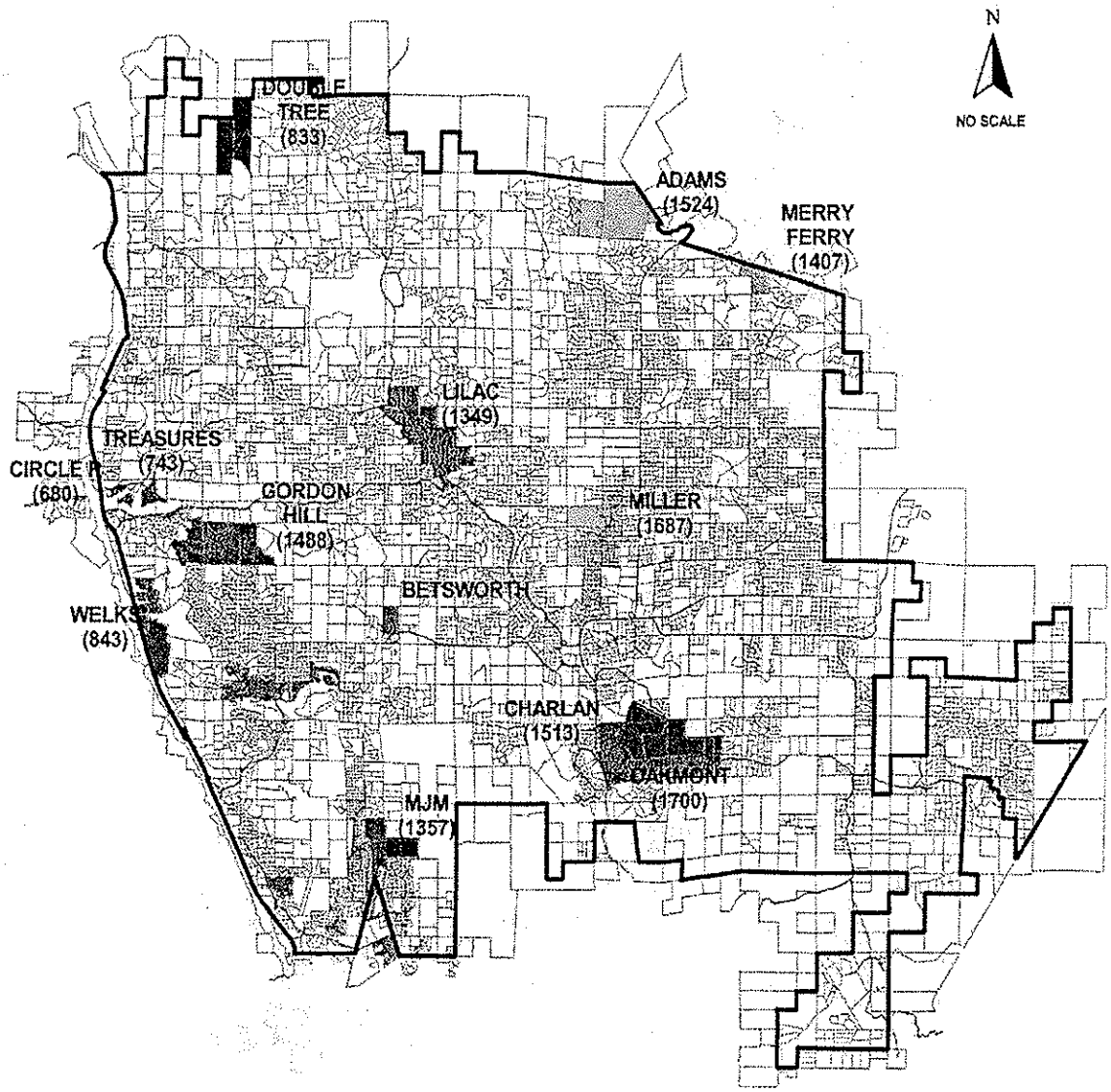


Figure 2-4. Pressure Regulated Areas
Source: VCMWD Water Master Plan

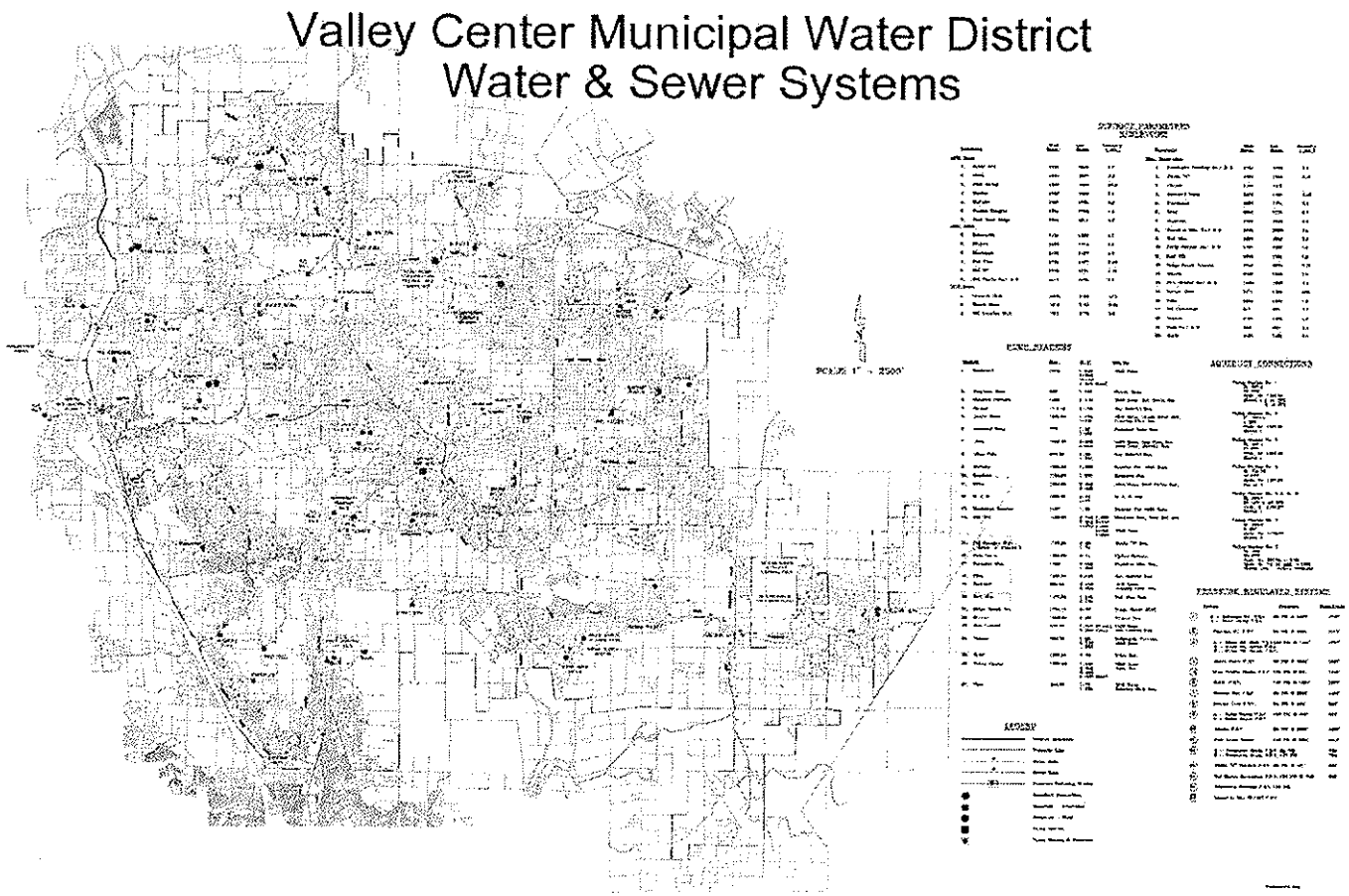


Figure 2-5. VCMWD Water and Sewer Systems – Source: VCMWD

A cluster of three of the zones, the Jesmond Dene, Reidy Canyon and MJM, are interconnected with each other, but are connected to the remainder of the system only through a pressure-reducing facility at the Jesmond Dene Bypass Station. This connection provides an alternate source of water under emergency conditions. These zones are generally served from the VC No. 2 aqueduct connection and operate essentially as an independent system.

CHAPTER 3

HISTORICAL AND PROJECTED WATER USE

Water demand projections along with fire-flow requirements provide the basis for sizing and staging future water facilities. Water use and production records, combined with projections of population, employment, and urban development, provide the basis for estimating future water supply requirements. This chapter presents an analysis of available demographic and water use data, customer connections, historical groundwater and surface water production, unit water use, and the resulting projections for future water supply needs for the District.

3.1 Population, Employment, and Housing

In order to be able to provide for the area's future water demands and water use characteristics, it is important to have reasonable estimates of future population totals and future regional trends. To develop these projections, historic population and water use information was analyzed. Information from the SANDAG provided current estimates and forecasts of population, housing, employment, land use, and other planning data. Additional data were available from various in-house documents, including the 2002 Water Master Plan and Strategic Plan. With this information, the District has been able to develop reasonable estimates of future water demands and supply needs.

Water use in the San Diego region is closely linked to the local economy, population growth, and climatic factors. Southern California experienced dramatic economic growth during the 1970s and 1980s, and the resulting influx of new population produced increased long-term water demands. In the 1990s, however, the rate of economic growth declined due to the severity and duration of the recession, which in California was led by declines in manufacturing, particularly the defense and aerospace industries. This regional downturn did not entirely dampen population growth, which in recent years has been generated more by natural increases than by job creation.

Recent records show that the population in the District area grew by only 1800 people between 2000 and 2005, an increase of only 10 percent over the five-year period. This slower than anticipated growth rate is now reflected in current population projections for the area.

Since the 2000 Plan was prepared, the projected population figures for the District have been revised to substantially lower numbers. In 2000, the projected population for the VCMWD area was 38,522 for year 2020. As indicated in Table 3-1 on the following page, the current population projection for year 2020 is now 33,316, a decrease of 5,206 or 13.5 percent.

Table 3-1. Population History/Projections
Valley Center Municipal Water District (DWR Table 2)

Year	2000	2010	2020	2030
Population	23,000	27,331	33,613	47,853

Source: SANDAG 2030 Cities/County Forecast – Subregional Area 53 – Valley Center. VCMWD Population Estimate.

In this same report, SANDAG is projecting that most of the anticipated growth within the District will be in occupied housing units, which is expected to increase by 125 percent increase over 2000 levels. Occupied single family housing units were established at 5,267 units in 2000 and are projected to be 13,506 units in the year 2030. Occupied multiple family units were set at 143 units for 2000 and are projected to be 160 units in the year 2030; this represents a 12 percent increase in multi-family units. Occupied mobile homes are projected to increase slightly from 1,354 units in year 2000 to 1,521 units in the year 2030.

SANDAG predicts an increase in land utilized for Single Family housing (from 1,044 acres in 2000 to 2,047 acres in 2030, a 96 percent increase over the 30-year period). In addition, there were 23,289 acres of vacant developable land available in 2000. There will only be 1,559 acres available in 2030 – a decrease of 93 percent. These predictions confirm the expected transition from a predominantly agricultural area to that of large single-family homes and mixed agricultural/residential usage.

Past and current District connections by customer type are presented in Table 3-2 on the following page. The following information pertains to the metering program in the District:

- All water services are metered and billed at a single rate per unit for all consumption.
- Meters are limited to maximum 3-inch capacity, except for special applications (mobile home parks, hotels, resorts, condominiums).
- Construction meters are read and monitored monthly.
- Construction meters are periodically refurbished and/or replaced.
- A portable test and repair unit is utilized for in-field testing and calibration of 1-1/2-inch through 3-inch meters.
- Meter use is matched to optimum flow ranges to reduce excessive meter wear and resulting loss.
- A meter exchange program is used to reduce water loss associated with excessive wear.

Table 3-2. Connections by Customer Classification

Customer Classifications	Historical Connections				Projected Connections			
	1990	1995	2000	2005	2010	2015	2020	2025
Single-family	3,650	4,640	5,135	6,380	7,756	8,973	10,189	11,406
Multi-family	54	98	96	109	129	143	154	167
Commercial	184	149	290	217	153	176	199	222
Industrial	–	–	–	–	–	–	–	-
Institutional and Governmental	11	18	27	27	33	37	42	47
Landscape/recreation	–	–	41	135	40	46	52	58
Agricultural	2,105	1,489	1,696	1,725	1,555	1,469	1,382	1,296
Total	6,004	6,394	7,285	8,593	9,666	10,844	12,018	13,195

3.2 Historical Water Use

Records of historical water production obtained from the District serve as the basis for developing unit water demands for the District. Water production is the volume of water measured at the source, which includes all water delivered to residential, commercial, and public authority customers, as well as unaccounted-for water.

The District has identified that the community is in transition from an almost exclusively agricultural region to a combined agricultural and residential community, with the potential for greater residential water needs in the future. With the ongoing re-evaluation of the existing land use designations for the community, it is anticipated that zoning changes will impact the area's water supply master planning efforts. Planning and designing for future water, wastewater, and reclamation needs will require conservative and sound planning strategies to effectively accommodate anticipated future conditions.

For 20 years, the District experienced a steady increase in water demands, from 14,372 acre/feet per year (ac-ft/yr) in fiscal year 1969-1970 to a record high of 52,535 ac-ft/yr for fiscal year 1989-1990. Despite some population growth, however, water demands from 1991 to 1995 were below the projections made in the 1990 Plan Update. The decreasing water use during this time can be attributed to the poor economy, the six-year drought of 1986-1991, and implemented water conservation measures.

Water demand fluctuated during the 2000-2004 period. Average water purchased ranged from 36,900 acre feet in 2004-05 to 52,182 acre feet in 2003-04. Average water demand during the period 2000-2004 was approximately 45,316 acre feet per year.

3.2.1 Annual Water Production and Average Daily Demand

Past and current water use by customer sector is provided in Table 3-2. Additional water uses and losses are also shown. These additional water uses include unaccounted-for water.

Table 3-3. Past and Current Water Use by Customer Category and Additional Water Uses and Losses, ac-ft/yr (DWR Tables 12, 14 - 15)

	2000		2005		2010	
	metered		metered		metered	
Water Use Sectors	No. of accounts	Deliveries ac-ft/yr	No. of accounts	Deliveries ac-ft/yr	No. of accounts	Deliveries ac-ft/yr
Single family	5,135	6,071	6,380	5,843	7,756	7,616
Multi-family	96	352.7	109	471	129	450
Commercial	290	1359.1	217	1,258	153	517
Industrial	-	0	-	0	-	0
Institutional/Gov	27	161.5	27	184	33	207
Landscape	-	0	-	0	-	0
Agriculture	1,696	37,967.5	1,725	28,020	1,555	32,758
Other	41	104.8	135	2,329*	139	2,187*
Total Water Use	7,285	46,016.6	8,593	38,105	9,765	43,736

	2015		2020		2025	
	metered		metered		Metered	
Water Use Sectors	No. of accounts	Deliveries ac-ft/yr	No. of accounts	Deliveries ac-ft/yr	No. of accounts	Deliveries ac-ft/yr
Single family	8,973	7,973	10,189	8,793	11,411	8,924
Multi-family	143	519	154	472	165	500
Commercial	176	583	199	525	223	537
Industrial	-	0	-	0	-	-
Institutional/Gov	37	230	42	253	47	276
Landscape	-	0	-	0	-	-
Agriculture	1,469	31,434	1,382	26,496	1,295	24,235
Other	142	2,290*	140	1,923*	138	1,814*
Total	10,940	43,029	12,106	38,462	13,279	36,287

* Includes unaccounted system losses

3.2.2 Unaccounted-for Water

Unaccounted-for water use is unmetered water use such as for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, and unauthorized connections, reservoir cleaning, and other municipal uses. Unaccounted-for water can also result from meter inaccuracies. The following actions are implemented to help account for unmetered uses:

- Unmetered uses are monitored monthly.
- Facilities are inspected daily, including reservoirs, pumping stations, and valve vaults.
- All easements and pipeline alignments are visually inspected annually.
- Reports are completed for all leaks.
- Responsible parties are billed for any water loss (damaged fire hydrants, air vacs, blowoffs, etc.).
- A leak detection program is in place, utilizing sonar equipment and specially trained personnel.
- District personnel responds and promptly investigates all reported potential leaks.
- The District monitors and pursues prosecution for water theft.

Since the District is not completely metered, data are unavailable for determining the percent of unaccounted-for water. Unaccounted-for water is shown as a line item in Table 3-3 and is assumed for this study to be approximately 5 percent of total water production.

3.3 Demand on Wholesale Supply

SDCWA currently provides 100% of the water distributed by the VCMWD. Table 3-4 provides the projected amount of water that the VCMWD expects to purchase from SDCWA to meet water demands in the future.

Table 3-4. District Demand Projections to Wholesale Suppliers, ac-ft/yr (DWR Table 19)

Wholesaler	2010	2015	2020	2025
SDCWA	43,736	43,029	38,462	36,287

3.4 Projected Water Demands By Water Year Type

This section presents the projected water demands for three water year scenarios: normal year, single dry year, and multiple dry year. The demands for all water year scenarios are projected through 2025.

3.4.1 SDCWA Projected Water Demand

As stated, the foundations of the water demand forecast are the underlying demographic and economic projections. This was a primary reason, why, in 1992, the SDCWA and SANDAG entered into a Memorandum of Agreement (MOA), in which the Water Authority agreed to use SANDAG's current regional growth forecast for water supply planning purposes. In 1994, the SDCWA selected the Institute for Water Resources - Municipal and Industrial Needs (MAIN) computer model to forecast municipal and industrial water use for the San Diego region. The MAIN model uses demographic and economic data to project sector-level water demands (i.e., residential and non-residential demands).

In addition, the MOA recognizes that water supply reliability must be a component of San Diego County's regional growth management strategy as required in Proposition C (passed by San Diego County voters in 1988). The MOA ensures a strong linkage between local general plan land use forecasts and water demand projections for the San Diego region. Consistent with previous modeling efforts, the 2005 water demand forecast update utilized the latest official SANDAG demographic projections. The new SANDAG 2030 Forecast, released in December 2003, extended the projection horizon an additional ten years to 2030. Member agency-level demographic and economic projections were compiled from this SANDAG forecast and incorporated into the MAIN model. The Manufacturing and Industrial (M&I) forecast also included an updated accounting of projected conservation savings based on projected regional implementation of the CUWCC Best Management Practices and SANDAG demographic information for the period 2005 through 2030. These savings estimates were then factored into the baseline M&I forecast. A separate agricultural model, also used in prior modeling efforts, was used to forecast water demands within the SDCWA service area. This model estimates agricultural demand met by the SDCWA's member agencies based on agricultural acreage projections provided by SANDAG, crop distribution data derived from the DWR and the California Avocado Commission, and average crop-type watering requirements based on California Irrigation Management Information System (CIMIS) data.

3.4.2 VCMWD Projected Water Demand

The ultimate demands will vary from year to year depending on many factors including not only growth and development, but also weather patterns, economic conditions, and conservation practices, to name a few. As discussed within this document, the population within the District is expected to gradually increase over the next 20 years, along with a corresponding gradual decrease in agricultural activities. How these trends impact future water demands depends on several factors, including domestic and agricultural water use. Each is discussed in more detail below.

3.4.3 Domestic Water Use

Studies show that several factors serve to either increase or decrease the gross per capita use rate (total water use divided by total population). Major factors that increase the gross per capita use rates include: increased household size, increased household income, geographic growth differentials (i.e., hotter inland areas versus cooler coastal areas), and an increasing regional per capita product. Factors that decrease the per capita use include: an increasing share of multifamily housing units, recent California Plumbing Codes revisions, educational programs, conservation programs, and changes in retail pricing. Significant increases in water rates can also result in decreased water use demand.

On a regional level, it is anticipated that the reduction factors will offset most of the increasing factors.

3.4.4 Agricultural Water Use

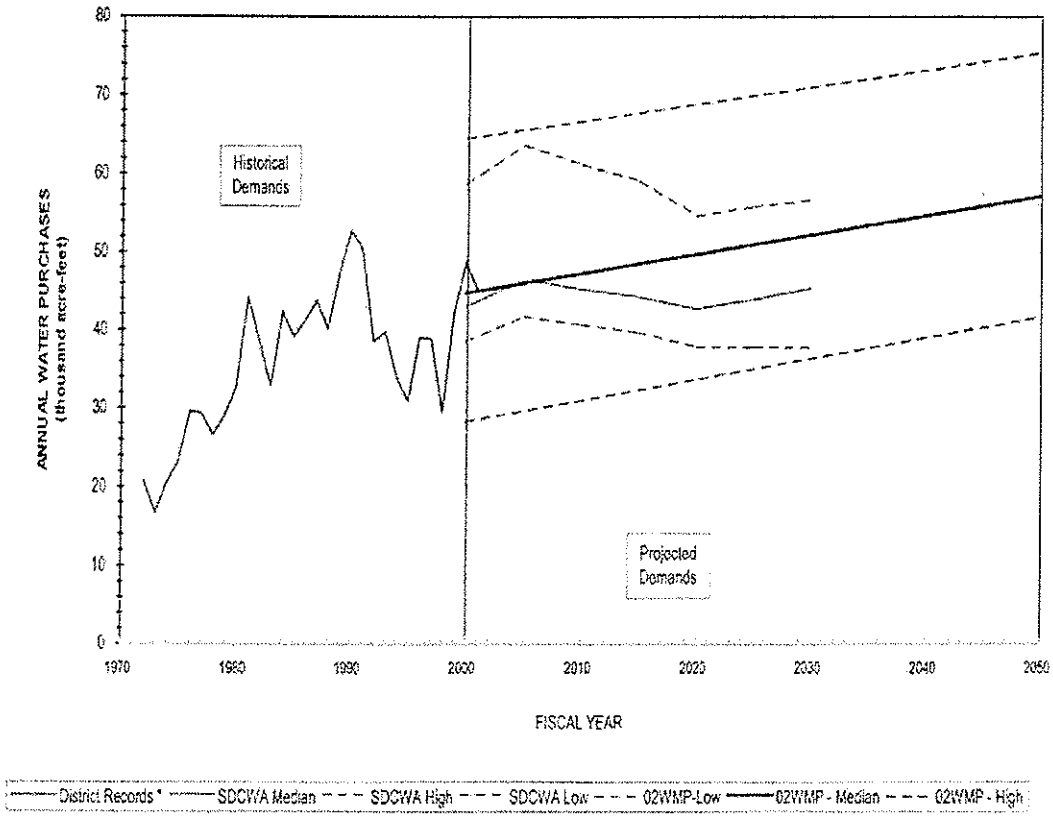
Coupled with land values and the total costs for crop production, the economics and availability of water supplies will certainly impact future agricultural water use. The combined water rate discount for agricultural water users from MWD's Interim Agricultural Water Rates Program and SDCWA is currently $177 per acre-foot. This discount saved VCMWD customers $6.08 million in FY 2004-2005, and over $55 million from 1994 through June of 2005. However, in return for the discount, agricultural users are subject to delivery interruptions of up to 30 percent prior to any mandatory delivery reductions to municipal and industrial users. Potential reductions in water deliveries would likely result in corresponding losses of crop production.

Although these discounts have generally served to stabilize agricultural water sales, future agricultural activities will largely hinge on the future of MWD's program. Any significant increase in future agricultural water rates would tend to accelerate the community's movement from agricultural activities to large lot residential uses.

3.4.5 VCMWD Previous Normal Year Demand Projections

The demand forecasts shown in Figure 3-1 include an estimate of the upper and lower limits of the range of probable water demands developed by Boyle Engineering for the 1994 Water Master Plan, updated in 2002. The projections shown in the SDCWA Regional Water Facilities Master Plan (December 2002) are also included in Figure 3-1 for comparison purposes.

Figure 3-1. Historical and Projected Water Demand
Source: VCMWD Water Master Plan, April 2002



* Based on water purchased from SDCWA.
SDCWA Values based on their projections.

The 1994 VCMWD Water Master Plan, which was updated in 2002, presented the following criteria for estimating the probable upper and lower limits of the projected range of ultimate demands:

- High Estimate
  - Agricultural unit demands increase from 1.48 gpm/acre to 2.2 gpm/acre to reflect estimates of higher unit demands.
  - Non-agricultural unit demands remain unchanged.
- Median Estimate
  - Agricultural unit demands remain unchanged at 1.48 gpm/acre.

- All other unit demands decrease by 20 percent to reflect mandatory conservation policies.

- Low Estimate

  - Agricultural unit demands decrease from 1.48 gallons per minute (gpm)/acre to 0.87 gpm/acre indicating that large high-volume farms are no longer viable.

  - Non-agricultural demands decrease by 20 percent to reflect mandatory conservation policies.

Applying the above criteria to the projected ultimate demands, results in a range of ultimate demands from 41,500 to 75,200 ac-ft/yr, with a median value of 56,920 ac-ft/yr. Table 3-5 on the following page outlines the normal water demands.

The SDCWA report indicates that the upper and lower limits cited in their report represent the 5th and 95th percentile values. As such, 90 percent of all actual annual demands will fall within these two limits.

The demand projections in this report are lower than the demand projections in the last plan. Differences between demand projections may occur due to differing methodology and assumptions used in the calculation of demand projections. Differences may also occur due to updates in demographic projections based on the year 2005 census.

3.4.6 Normal Year Water Demand Projections for the 2005 UWMP Update

As Table 3-5 indicates, the District's normal year water demand projections are in the low range of demands reflected in the District's 2002 Water Master Plan as well as the SDCWA's 2002 Water Master Plan. In fact, in the later years of the current planning horizon, demand levels are projected to decline. This dramatic change in demand forecasts from the 2000 UWMP is tied to the revised SANDAG population growth projections reflected in the 2005 Urban Water Management Plan Update for the San Diego County Water Authority. The two factors at work here are the levels of population growth assigned by SANDAG to the unincorporated communities in San Diego County, and an assumed rate of agricultural to residential land conversion to accommodate this projected growth.

Though the revised demand projections have been incorporated into the District's 2005 UWMP Update, the following formal comments on the SDCWA UWMP 2005 update were forwarded to the SDCWA in a letter dated September 16, 2005:

"With our general comments completed, we want to focus on the specific issue of projecting agricultural water demand for the region and our agency through 2030. Our issues and concerns have been raised in previous correspondence, expressing our view that the water demand projected for agriculture, especially in the out years, may be significantly low…

At the core of these concerns was, and to some degree still is the prospect that the SDCWA may revise its capital improvement program to match at what might be an overly reduced demand forecast. The overall concern here, of course, being that future system capacity may not be adequate if agricultural demands remain significantly higher than predicted.

In response to comments from our agency and others with large agricultural water demands, you and your staff worked with SANDAG to re-evaluate the methodology used in developing the agricultural water demand projections. The main modification was that on residential land with parcels of 10 acres or larger, only a small portion of the land was converted to residential use, and the balance was left as agricultural use. The result has been a significant increase in the projected agricultural demand through the year 2030…

With respect to our agency, your final Regional Water Demand Forecast places Valley Center's total demand in 2030 at 36,287 acre feet, with 19,059 going to agriculture, compared to the preliminary projection of 29,400 acre feet total and 12,178 going to agriculture. Though this represents a significant increase (23.4%) 36,287 acre feet of total demand in fact is still on the low-end of the demand range projected in our 2002 Water Master Plan which has our low 2030 year demand at 36,000 acre feet and our mid-point projection was in the area of 50,000 acre feet. Though we feel that, given current trends, demands above the 50,000 acre feet level in 2030 is somewhat unrealistic, water demand in the range of 35,000 to 45,000 acre feet in the 2030 time-frame may not be unreasonable. As an aside, our Water System Master Plan is scheduled to be updated in 2007, and will consider many of the factors now reflected in the SDCWA current projections.

While we understand that, by agreement, the SANDAG projections must be utilized as the basis for future water demand projections, we would advise the SDCWA to:

1. Incorporate a reasonable range (+10%-15%) in variability in future agricultural water demand, just as it should with projecting levels of M&I demand, conservation and local resource development, and account for that variability into its resource and capital facility planning and development to meet future water needs.

2. With the assistance of its member agencies having large agricultural demand segments, closely monitor the character of agricultural demands over the ensuing years, focusing on the diminishment of agricultural use on properties which convert to residential use. It may be that the 10 acre residential parcel level used in the current projections may have to be modified to a smaller parcel size.

3. Be prepared to adjust agricultural demand projections based upon future data

Data, perhaps even prior to the 2010 Urban Water Management Plan update if Appropriate."

Table 3-5 Projected Normal Year Water Supplies and Demands by Customer Category and Additional Water Uses and Losses, ac-ft/yr (DWR Tables 40-41)

Water Use Category	2010	2015	2020	2025
Single-family	7,731	8,869	8,952	9,102
Multi family	450	519	472	500
Commercial	517	583	525	537
Industrial	0	0	0	0
Institutional	51	58	52	53
Landscape irrigation	41	47	42	46
Recycled	32,758	33,434	26,496	24,235
Unaccounted-for water	2,187	2,290	1,923	1,814
Total annual average	43,736	43,029	38,462	36,287
Supply	43,736	43,029	38,462	36,287
Demand	43,736	43,029	38,462	36,287
Percent of year 2005	-1	-3	-15	-22

3.4.7 Projected Single-Dry Year Water Demands

Water use patterns change during dry years. During dry years some water agencies cannot provide their customers with 100 percent of what they deliver during normal water years. One way to analyze the change in demand is to document expected changes to water demand by sector. Expected changes in demand may include assuming increasing demands due to increased irrigation needs and demand reductions resulting from rationing programs and policies. It is assumed that overall demands will not change during a single dry year. Any demand reductions due to the implementation of the District's water shortage contingency plan are not included in the single dry year demand estimates. Table 3-7 provides an estimate of the projected single-dry year water demands.

Table 3-6. Projected Single Dry Year Water Demands, ac-ft/yr (DWR Table 44)

Category	2010	2015	2020	2025
Total demand	47,487	49,710	41,731	39,350
Percent of projected normal	109%	113%	108%	108%

3.4.8 Projected Multiple-Dry Year Water Demands

This section projects the impact of a multiple dry year period for each 5-year period during the 20-year projection. It is assumed that overall demands will not change during a multiple dry year. Any demand reductions due to the implementation of the District's water shortage contingency plan are not included in the multiple dry year demand estimates. Tables 3-8 through 3-11 provide an estimate of the projected multiple-dry year water demands for each 5-year period.

Table 3-7. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2010 (DWR Table 47)

Category	2006	2007	2008	2009	2010
Total demand	51,576	47,859	47,739	47,611	47,487
Percent of projected normal	117%	109%	109%	109%	109%

Table 3-8. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2015 (DWR Table 50)

Category	2011	2012	2013	2014	2015
Total demand	47,932	48,376	48,821	49,265	49,710
Percent of projected normal	110%	111%	113%	114%	116%

Table 3-9. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2020 (DWR Table 53)

Category	2016	2017	2018	2019	2020
Total demand	48,114	46,518	44,922	43,327	41,731
Percent of projected normal	114%	113%	112%	110%	108%

Table 3-10. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2025 (DWR Table 56)

Category	2021	2022	2023	2024	2025
Total demand	41,255	40,778	40,302	39,826	39,350
Percent of projected normal	108%	108%	108%	108%	108%

CHAPTER 4

WATER SUPPLIES

This chapter discusses the District's current sources of water supply, the quality of the supply, new supply opportunities, exchanges and transfers of water, and supply management programs.

4.1 EXISTING SOURCES OF WATER SUPPLY

As shown in Table 4-1 below, VCMWD imports 100 percent of its water from the SDCWA who, in turn, purchases water from the MWD. Total imported water purchased in the fiscal year ending June 2004 was 52,181 acre-feet. The imported water is conveyed into the area via MWD and SDCWA facilities.

Table 4-1. Historic and Projected Water Supplies
Valley Center Municipal Water District (DWR Table 4)

Water Supply Sources	2005	2010	2015	2020	2025
Purchased from wholesaler: - SDCWA	38,105	43,736	43,029	38,462	36,287
Supplier produced groundwater	0	0	0	0	0
Supplier produced surface diversions	0	0	0	0	0
Transfers	0	0	0	0	0
Exchanges In	0	0	0	0	0
Recycled Water	355	420	420	420	420
Other	0	0	0	0	0
Total	**38,460**	**44,156**	**43,449**	**38,882**	**36,707**

Units of Measure: ac-ft/yr

Source: SDCWA and VCMWD projections

Upon its formation in 1954, the District joined the SDCWA and MWD to acquire the right to purchase and distribute imported water throughout its service area. The SDCWA has 23 member agencies, and is the regional wholesaler of imported waters.

This imported water, which is delivered into the SDCWA's First and Second San Diego Aqueducts from MWD facilities located just south of the San Diego County/Riverside County line, consists of a combination of Colorado River Water and State Project Water. From 1991-1994, however, almost 100 percent of the water originated in the Colorado River. From 1994-1995 on, the water supply originated from both the State Water Project and the Colorado River. The percentages of water

originating from the State Water Project and the Colorado River over the last 5 years is reflected in the following table.

Table 4-2. SDCWA / VCMWD Water Supply Origins

Year	State Water Project	Colorado River Aqueduct
2005	44%	56%
2004	34%	66%
2003	30%	70%
2002	26%	74%
2001	27%	73%

Source: SDCWA

Future projects that may contribute to the District's water supply are summarized in Table 4-3.

Table 4-3. Future Water Supply Projects (DWR Table 17)

Project Name	Projected Start Date	Projected Completion Date	Normal-year ac-ft to agency	Single-dry year yield ac-ft	Multiple-Dry-Year 1 ac-ft	Multiple-Dry-Year 2 ac-ft	Multiple-Dry-Year 3 ac-ft
Carlsbad Seawater Deslination Project/ Poseidon Resources	2008	2010-11	7,500	7,500	7,500	7,500	7,500

4.1.1 MWD of Southern California

The MWD was created in 1928 following the passage of the MWD Water District Act by the California Legislature to provide supplemental water for cities and communities on the south coastal plain of California. The MWD has 23 member agencies including the SDCWA, and covers an area which includes all, or portions, of Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties.

MWD serves as a water wholesaler, and provides water to its member agencies from both the Colorado River and the State Water Project. MWD's water supplies and management programs are discussed at length in the agency's 2005 Regional Urban Water Management Plan.

The MWD water is purchased by the SDCWA for resale to its 23 member agencies. The SDCWA organization is described below.

4.1.2 San Diego County Water Authority

The SDCWA was organized on June 9, 1944 under the County Water Authority Act for the express purpose of importing Colorado River Water into San Diego County. The SDCWA annexed to MWD in 1946 and is now represented on the MWD Board by six directors, as its largest customer. The VCMWD is one of 23 member agencies of the SDCWA. Member agency status entitles the District to directly purchase water from SDCWA on a wholesale basis. The District also looks to the SDCWA to insure, to the best of its ability, that adequate amounts of water will be available to satisfy future water requirements.

Water imported from MWD is sold wholesale to SDCWA's member agencies. Each agency is autonomous and its city council or board of directors sets local policies and water pricing structures, and appoints representatives (based on assessed valuation) to the SDCWA's Board of Directors. VCMWD currently has one representative on the SDCWA Board.

SDCWA's water supplies and management programs are discussed at length in the agency's 2005 Urban Water Management Plan.

4.2 Transfers and Exchanges

VCMWD relies entirely on water purchased from the SDCWA, and does not participate individually in any water transfer or exchange programs at this time. The regional exchanges and transfers being implemented and pursued by the SDCWA are briefly described herein and are described in greater detail in the SDCWA's 2005 Urban Water Management Plan Chapter 4.

Regional exchanges and transfers being pursued by the MWDSC are documented in the MWD's 2000 Regional Urban Water Management Plan.

4.2.1 SDCWA-Imperial Irrigation District (IID) Conservation and Transfer Agreement

On April 29, 1998, the SDCWA and the Imperial Irrigation District signed a Water Conservation and Transfer Agreement which represents the largest agriculture-to-urban water transfer in United States history. Under the agreement, Colorado River water will be conserved by Imperial Valley farmers voluntarily participating in the program and will then be transferred to the SDCWA for use in San Diego County. On October 10, 2003, the SDCWA and IID executed an amendment to the original 1998 Transfer Agreement. This amendment modified certain aspects of the 1998 Agreement to be consistent with the terms and conditions of the Quantification Settlement Agreement (QSA) and related agreements. It also modified other aspects of the agreement to lessen the environmental impacts of the transfer of conserved water. The amendment was expressly contingent on the approval and implementation of the QSA, which was also executed on October 10, 2003.
As shown in Table 4-4 below, the SDCWA will receive between 30,000 and 200,000 ac-ft/yr between 2005 and 2025, and will remain steady at 200,000 ac-ft/yr thereafter, over the term of the agreement.

Table 4-4. Projected IID Transfer Supply

YEAR	TRANSFER SUPPLY (ac-ft/yr)
2005	30,000
2010	70,000
2015	100,000
2020	190,000
2025	200,000
2030	200,000

Source: 2005 SDCWA UWMP

The initial term of the SDCWA-IID agreement is 45 years and includes a provision that either agency may extend the agreement for an additional 30-year term. Under certain conditions, up to 34,000 acre-feet can be recalled by IID at the end of the initial 45-year term.

During dry years, when water availability is low, the conserved water will be transferred under IID's Colorado River rights, which are among the most senior in the Lower Colorado River Basin. Without the protection of these rights, the SDCWA could suffer delivery cutbacks. In recognition for the value of such reliability, the contract requires the SDCWA to pay a premium on transfer water under defined regional shortage circumstances.

The costs associated with the transfer are proposed to be financed through the SDCWA's rates and charges. In the agreement between the SDCWA and IID, the price for the transfer water started at $258/acre-feet and increases by a set amount for the first five years. The 2005 price for transfer water is $276/acre-feet. Procedures are in place to evaluate and determine market-based rates following the first five-year period.

In accordance with the October 2003 amended exchange agreement between MWD and the SDCWA, the initial cost to transport the conserved water was $253/acre-feet. Thereafter, the price would be equal to the charge or charges set by MWD's Board of Directors pursuant to applicable laws and regulation, and generally applicable to the conveyance of water by MWD on behalf of its member agencies. The transportation charge in 2005 is $258/acre-feet.

The SDCWA is providing $10 million to help offset potential socioeconomic impacts associated with temporary land fallowing. IID will credit the SDCWA for these funds during years 16 through 45. At the end of 2007, the SDCWA will prepay IID an additional $10 million for future deliveries of water. IID will credit the SDCWA for this up-front payment during years 16 through 30 of the agreement. As part of implementation of the QSA and water transfer, the SDCWA also entered into an environmental cost sharing agreement. The agreement specifies that the SDCWA will contribute

$64 million for the purpose of funding environmental mitigation costs and contributing to the Salton Sea Restoration Fund (SDCWA 2005 UWMP).

4.3 Other Sources of Imported Water

As supplies from the IID water transfer and the SDCWA's preferential rights from MWD are not sufficient to meet the imported water needs of the region, the SDCWA must pursue additional supplies, either local and/or imported. Potential imported sources include various types of water transfers and/or MWD non-firm supplies that may be available to the SDCWA.

In 1998, the SDCWA's Board of Directors authorized staff to prepare and distribute a request for proposal (RFP) for additional transfers. The SDCWA has explored and will continue to explore transfer and water storage opportunities throughout California that have the potential to provide a reliable imported water supply to help meet the SDCWA's supplemental water needs. However, all such programs are dependent on obtaining access to the water conveyance facilities operated by MWD. The SDCWA is taking all steps necessary to obtain access to those facilities on a fair and equitable basis including but not limited to seeking review of the wheeling statutes by the California Supreme Court in MWD of Southern California vs. Imperial Irrigation District, et al., S089760.

4.3.1 Other Potential Transfers

There is the potential to obtain additional transfer supplies, beyond the IID transfer, to meet the future demands of the San Diego region. There are various types of transfers available that are typically categorized into the following types:

1. **Core Transfers** - Core transfers make water available through multi-year contracts that convey a specific amount of water to the purchaser each year. The IID water transfer is defined as a core transfer.

2. **Spot Transfers** - Spot transfers make water available for a limited duration (typically one year or less) through a contract entered into in the same year that the water is delivered.

3. **Option Transfers** - Option transfers are multi-year contracts that allow the purchaser to obtain a specified quantity of water at some future date. They usually require a minimum payment for water even if the water is not needed. For example, an agreement may require water to be purchased one out of every five years.

4. **Storage Transfers** - Storage transfers allow the purchaser to place water into storage for delivery at some time in the future.

5. **Water Exchanges** - Water exchanges are agreements between the purchasing agency and selling agency that allow for the exchange of water from one source for water to a different source.

The IID transfer supply is conserved water from the Colorado River. The other two geographic regions where transfer water is currently available are central and northern California. Transfers from northern and central California would utilize State Water Project (SWP) conveyance capacity.

4.3.2 State Water Bank

One example for how such transfers could be made available is the State Water Bank created during the end of the last drought. In 1991, as a drought emergency measure, DWR created the bank to enable water-short districts and agencies to purchase supplies from willing water sellers. DWR purchased the water supplies primarily from northern California agricultural entities and sold these supplies to entities experiencing drought shortages. DWR purchased the water for $125/acre-feet and sold it for $175/acre-feet (1991 costs). MWD purchased 215,000 acre-feet in 1991; the SDCWA, due to cutbacks in supply from MWD, had to separately purchase 21,600 acre-feet through MWD.

4.3.3 CALFED Bay-Delta Program

Work being done by the CALFED Bay-Delta Program is expected to provide the greatest opportunity for SWP supply reliability and water quality improvements, though presently the outcome is uncertain. The state and federal governments organized the CALFED Program in 1995 to develop a comprehensive long-term solution to the ecosystem, levee stability, water quality and water supply reliability problems affecting the Bay-Delta system. The CALFED Program began its transition from planning to implementation in June 2000 with the release of a document entitled, California's Water Future: A Framework for Action (Framework). The Framework, which focuses on the first seven years ("Stage 1") of what CALFED envisions to be a 30-year program, outlines a number of specific steps to improve the quality and reliability of Bay-Delta water supplies, increase the efficient use of water throughout the state, restore the Bay-Delta ecosystem, stabilize Delta levees, and foster the water transfer market. The Framework was followed in July 2000 by a final programmatic environmental impact statement/environmental impact report (EIS/EIR) that sets the stage for implementation of the CALFED Program.

The elements of the CALFED Program that have the greatest potential for increasing the reliability and quality of SWP supplies involve improvements to the existing Delta conveyance system, including expansion of the permitted capacity of the SWP pumping plant from its current level of 6,680 cubic feet per second (cfs) to 8,500 cfs and ultimately to 10,300 cfs subject to certain conditions; and a new water "budget" for protection of fish known as the Environmental Water Account (EWA). The conveyance system improvements would improve the reliability and quality of SWP supplies by allowing the SWP to increase pumping during those times of the year when additional water is available and when water quality is highest, and reduce pumping when endangered fish are migrating through the Delta. The improvements will also increase the amount of pumping capacity available for other purposes, such as water transfers. New surface and groundwater storage could also enhance the reliability and quality of SWP supplies. The CALFED Framework calls for the construction of up to 4.75 million acre-feet of new surface and groundwater

storage over the life of the Program; however, it is not known whether any of the new storage would be constructed as part of the SWP.

The amount of water produced through the proposed conveyance improvements will depend on how the individual facilities are operated and on the level of assurances provided by the state and federal regulatory agencies. The EWA, as proposed in the Framework, will be used to provide the State Water Project and Central Valley Project regulatory assurances for the first four years of the CALFED Program, with the expectation that the assurances will be extended periodically thereafter. The regulatory assurances are intended to ensure that the projects will not face additional water supply impacts due to regulatory actions taken under the federal Endangered Species Act or other federal or state laws or regulations. If CALFED succeeds in its mission of restoring stability to the Bay-Delta system, and the regulatory assurances are extended beyond the initial four-year period, then the improvements called for in the CALFED Framework have the potential to increase MWD's share of average SWP supplies by about 0.15 MAF, to a total of 1.5 million acre-feet. If CALFED is not successful, and the Bay-Delta system continues to decline, then the improvements proposed in the Framework may produce little or no supply reliability or water quality improvement and MWD's SWP supplies could even decrease relative to existing levels.

Under the CALFED Bay-Delta Framework, a Water Transfers Program will be initiated whose goal is to, "encourage the development of a more effective water transfer market that facilitates water transfers and streamlines the approval process while protecting water rights, environmental conditions, and local economic interests." This effort will assist agencies, such as the SDCWA, in implementing water transfers from northern and central California.

4.3.4 Non-firm Supplies from MWD

In addition to transfer supplies, other imported supplies from MWD may be available to the SDCWA. This water is considered a non-firm supply because it would be subject to call by other MWD agencies having a preferential right to such supplies. In addition, MWD is in the process of formulating a new rate structure and it is unknown at this time what final rights and cost structure will emerge from this process.

4.4 Salinity Issues

The levels of salinity can vary greatly between MWD's two sources of imported water. Salinity control has long been an issue on the Colorado River, as supplies from the Colorado River Aqueduct (CRA) can reach 700 milligrams per liter (mg/l) total dissolved solids (TDS). By comparison, the State Water Project provides an average 250 mg/l from the East Branch and 325 mg/l from the West Branch (San Diego County is served from the East Branch of the State Water Project). High salinity levels can damage water delivery systems and home appliances and also cause problems for water recycling projects in the SDCWA's service area, especially for marketing recycled

water to agricultural users growing salt-sensitive crops. (Refer to the SDCWA's 2005 Urban Water Management Plan, Section 7, for details on salinity impacts to water recycling.)
Water lower in TDS is required to blend with the higher TDS Colorado River water that will be supplied by IID in order to achieve a lower overall TDS in the SDCWA's supplies. Additional transfer supplies for the San Diego region would not only help meet demands but could also provide lower salinity water for purposes of blending with IID transfer water.

4.5 Physical Constraints

There are no physical constraints on the current water supplies that limit the ability to meet current demands.

4.6 Legal Constraints

There are no legal constraints on the current water supplies that limit the ability to meet current demands.

4.7 Groundwater

As stated previously in Section 2.3.1, well water is not anticipated to be a substantial part of the near future water supply.

4.8 Desalination

On December 19, 2005, the District entered into a "take or pay" water purchase agreement with Poseidon Resources, Inc. for 7,500 acre feet of in-lieu desalinated seawater from the proposed Carlsbad Seawater Desalination Project. As envisioned by the agreement, Poseidon would treat and deliver 7,500 acre feet of desalinated seawater to one or more water agency exchange partners in close proximity to the proposed desal facility. In turn, the District will then take an equivalent amount of water from the imported water aqueduct system, as "in-lieu" desalinated seawater to be considered as a local supply for the District. By the terms of the agreement, the water purchased from Poseidon would at no time exceed the cost of imported water taken from the San Diego County Water Authority, nor could taking the water impede the District's access to certification for discounts under the MWD Interim Agricultural Water Program, and Poseidon will be required, with the District's cooperation and assistance, to secure the required exchange partner or partners. By the terms of the agreement, there is a long-term potential for the desalted seawater costing less than the projected future cost of imported water. As a local supply, the availability of the desalted seawater would increase the District's overall water supply reliability under the water shortage allocation policies of the San Diego County Water Authority

Assuming that Poseidon moves forward with constructing the desal facility on the current time schedule and all of the pre-requisite agreement parameters are perfected, it is anticipated that the District could start receiving the in-lieu desalted seawater in the 2010 - 2011 timeframe.

As shown in Table 4-5, the Carlsbad Seawater Desalination project is the sole opportunity for the development of desalinated water within the District's service area as a future supply source.

Table 4-5. Opportunities for Desalinated Water (DWR Table 18)

Sources of Water	Opportunities
Ocean water	Carlsbad Seawater Desalination Project/Poseidon Resources
Brackish ocean water	None
Brackish groundwater	None

4.9 Water Quality

This section describes the water quality of the existing water supply sources within the District and the manner in which water quality affects water management strategies. In addition, this section describes the manner in which water quality affects the water supply.

VCMWD receives its entire imported water supply via the SDCWA's First Aqueduct Pipelines 1 and 2 and the Second Aqueduct Pipeline 4. Both aqueducts supply the District with treated water which meets existing drinking water standards and Health Department restrictions. The District's 2004 Water Quality Report is included as Appendix C of this document.

Water quality constituents and water treatment plant performance are becoming more strictly regulated by federal, state, and local entities. The first two water constituents of health-related significance were regulated in 1914, and the number of regulations increased slowly during the next 70 years. However, between the year 1986, when the Safe Drinking Water Act was amended and the year 2000, the number of regulated contaminants increased from 23 to more than 183. Financial impacts to VCMWD of increased regulation will likely be through increased water rates to the District. At this time the magnitude of any increases is unknown.

The quality of existing surface water and groundwater supply sources over the next 20 years is expected to be adequate. Purchased water will continue to be treated to drinking water standards, and no water quality deficiencies are foreseen to occur in the next 20 years. There are no viable groundwater supplies in the District.

Water quality affects the District's water management strategies through the District's efforts to be in compliance with Federal and State regulations. These regulations require rigorous water quality

testing, source assessments, and treatment compliance. No other special water management strategies due to water quality effects are necessary.

A summary of the current and projected water supply changes due to water quality is provided in Table 4-6.

Table 4-6. Current and Projected Water Supply Changes Due to Water Quality, percent (DWR Table 39)

Water Supply Sources	2005	2010	2015	2020	2025
Purchased	0	0	0	0	0
Groundwater	N/A	N/A	N/A	N/A	N/A
Recycled water	0	0	0	0	0
Desalination water	N/A	0	0	0	0

4.10 Current and Projected Normal Year Water Supplies

Table 4-7 shows the SDCWA's projected mix of future imported water supplies. In year 2005, imported deliveries will of necessity still be met by MWD. The MWD's The Integrated Resources Plan (IRP) identifies a mix of resources (imported and local) that when implemented will provide 100 percent reliability for full-service demands through the attainment of regional targets set for conservation, local supplies, SWP supplies, Colorado River supplies, groundwater banking, and water transfers. The 2003 update to the IRP now includes a planning buffer supply to mitigate against the risks associated with implementation of local and imported supply programs. The planning buffer identifies an additional increment of water that could potentially be developed if other supplies are not implemented as planned. As part of implementation of the planning buffer, MWD should evaluate supply development annually to ensure that the region is not over developing supplies. If managed properly, the planning buffer will help ensure that the southern California region, including San Diego County, will have adequate supplies to meet future demands. Specific information on MWD's IRP and Water Surplus and Drought Management Plan (WSDM Plan) is contained in their 2005 Regional Urban Water Management Plan (RUWMP).

In June 2004, the SDCWA Board of Directors voted unanimously to select seawater desalination as the preferred RWFMP alternative and added it and 21 other major water facilities projects to the CIP. This action, the largest investment in water supply reliability and system infrastructure in the SDCWA's 60-year history, more than doubled the agency's CIP, from $1.3 billion to more than $3.19 billion. The water supply and capital improvements currently under way and planned for the future are designed to serve the region's needs through 2030. Besides seawater desalination, they include new pipelines and pump stations to convey the water, a water treatment facility, improvements to the existing water delivery system, the All-American and Coachella Canal Lining Projects, and projects to increase storage capacity throughout the county.

The timing for implementation of the CIP projects will be evaluated based on the reliability analysis prepared for the 2005 Plan. If necessary, project schedules will be adjusted to accurately reflect when the project is needed for reliability purposes.

Table 4-7. Projected SDCWA Supplies (Normal Year – ac-ft/yr) (DWR Table 20)

	2005	2010	2015	2020	2025	2030
IID Water Transfer	30,000	70,000	100,000	190,000	200,000	200,000
All-American Canal Lining Project	0	56,200	56,200	56,200	56,200	56,200
Coachella Canal Lining Project	0	21,500	21,500	21,500	21,500	21,500
Regional Seawater Desalination at Encina	0	56,000	56,000	56,000	56,000	56,000
Total SDCWA Supplies	30,000	147,700	233,700	323,700	333,700	333,700

A water supply reliability comparison for Agency supply is made in Table 4-8, considering three water supply scenarios: normal water year; single-dry water year; and multiple-dry water years. The District also looks to the SDCWA to insure, to the best of its ability, that adequate amounts of water will be available to satisfy future water requirements.

Table 4-8. Wholesaler Supply Reliability – ac-ft/yr (DWR Table 21)

Wholesaler	Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
SDCWA	43,736	47,847	47,932	48,376	48,821	49,265
Percent of Normal	100%	8%	9%	10%	10%	11%

Factors resulting in inconsistency of the Agency's supply are included in Table 4-9.

Table 4-9. Factors Resulting in Inconsistency of Wholesaler's Supply (DWR Table 22)

Name of Supply	Legal	Environmental	Water Quality	Climatic	Earthquake
SDCWA				X	X

Based upon the current water entitlement from SDCWA, current and projected water supplies during a normal water year are presented in Table 4-10. The recycled water supply is described in Chapter 5. No water supply loss due to water quality is anticipated.

Table 4-10. Projected Normal Year Water Supplies, ac-ft/yr

Water Supply Sources	2010	2015	2020	2025
Purchased Water	43,736	43,029	38,462	36,287
Recycled water	420	420	420	420
Water supply loss due to water quality	(0)	(0)	(0)	(0)
Desalination water	0	0	0	0
Total	44,156	43,449	38,882	36,707

4.11 Water Supply Reliability

This section describes the reliability of the water supply and vulnerability to seasonal or climatic shortage. A water supply reliability comparison is made in Table 4-11 or the year 2025, considering three water supply scenarios: average/normal water year; single dry water year; and multiple dry water years.

Table 4-11. Water Supply Reliability (DWR Table 8), 2025, ac-ft/yr

Water Supply Sources	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Purchased Water	36,287	39,350	41,255	40,778	40,302	39,826
Recycled Water	2,320	2,320	2,320	2,320	2,320	2,320
Water Supply Loss Due to Water Quality	-	-	-	-	-	-
Desalination Water	7,500	7,500	7,500	7,500	7,500	7,500
Total	46,107	49,170	51,075	50,598	50,122	49,646
Percent of Normal Year Supply	100%	6%	10%	9%	8%	7%

The definitions of these three water supply scenarios as provided by DWR (DWR, 2005) are listed below. In evaluating the water supply reliability it is assumed that the single dry year and multiple dry years in this Plan have the same definition as drier and driest years in the Water Forum Agreement.

The definitions of these three water supply scenarios as provided by DWR (DWR, 2005) are provided below. In evaluating the water supply reliability it is assumed that the single dry year and multiple dry years in this Plan have the same definition as drier and driest years in the Water Forum Agreement.

1. Normal year is a year in the historical sequence that most closely represents median runoff levels and patterns. Normal is defined as the median runoff over the previous 30 years or more. This median is recalculated every ten years.

2. Single-dry year is generally considered to be the lowest annual runoff for a watershed since the water year beginning in 1903.

3. Multiple-dry year period is generally considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903.

Table 4-12. Basis of Water Year Data (DWR Table 9)
Valley Center Municipal Water District

Water Year Type	Year(s) Data is Based Upon / Precipitation
Average Water Year	1987 -- 16.74" 1991 -- 16.77"
Single Dry Water Year	1989 -- 4.77"
Multiple Dry Water Years	1988 -- 12.19" 1989 -- 4.77" 1990 -- 10.61" Avg. -- 9.19"

The SDCWA coordinated with its member agencies and MWD during preparation of the 2005 Plan on the future demands and supplies projected for the region. The Act requires that, for any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, that the agency describe, to the extent practicable, plans to replace that source with alternative sources or water demand management measures. As stated throughout the 2005 Plan, the SDCWA and its member agencies are planning to develop a diverse supply of resources. The unavailability of any one supply source will be buffered because of the diversity of the supplies: the region is not reliant on a single source. To replace or supplement an existing supply, the SDCWA could take steps to increase development of transfers or seawater desalination. Member agencies could also further maximize development of recycled water and groundwater. With a successful conservation program already in place, the SDCWA and its member agencies could effectively implement extraordinary conservation measures to assist in ensuring reliability. Another element of reliability is Metropolitan's IRP planning buffer, which identifies an additional increment of water that could be potentially developed if other supplies are not implemented as planned. A combination of these resources would be necessary to ensure a reliable supply (SDCWA UWMP 2005). There is no planned inconsistency of supply.

4.11.1 Projected Single-Dry Year Water Supplies

Studies have shown that hot, dry weather may generate urban water demands that are about 7 percent greater than normal and agricultural demands that are about 9 percent greater than normal. These percentages were utilized to generate the dry year demands shown in Tables 4-13 and 4-14.

No extraordinary conservation measures are reflected in the demand projections beyond implementation of the BMPs of the CUWCC as outlined in Chapter 7, "Conservation Practices."

The supplies available from recycling and groundwater recovery projects are assumed to experience little, if any, reduction in a dry-year. Therefore, estimated normal supply yields are included in the analyses.

Table 4-13. SDCWA Single Dry Water Year Supply and Demand Assessment Five Year Increments (ac-ft/yr)

SDCWA Supplies	2010	2015	2020	2025	2030
Regional Seawater Desalination at Encina	0	56,000	56,000	56,000	56,000
IID Water Transfer	70,000	100,000	190,000	200,000	200,000
ACC and CC Lining Projects	77,700	77,700	77,700	77,700	77,700
Sub-total	147,700	233,700	323,700	333,700	333,700
Member Agency Supplies					
Surface Water	22,284	22,284	22,284	22,284	22,284
Water Recycling	33,644	40,598	45,459	46,368	47,430
Groundwater	10,838	10,838	10,838	10,838	10,838
Groundwater Recovery	11,400	11,400	11,400	11,400	11,400
Sub-Total	78,166	85,120	89,981	90,890	91,952
MWD Supplies	541,784	477,150	411,879	424,020	457,378
TOTAL PROJECTED SUPPLIES	767,650	795,970	825,560	848,610	883,030
TOTAL ESTIMATED DEMANDS (w/ conservation)	767,650	795,970	825,560	848,610	883,030

[1]Near-term annexation demands are tentatively included in water demand forecast total. Final determination on including nearterm annexation demands in final water demand forecast to be made by Board of Directors.

Because no shortages are anticipated within the MWD's service area in the dry-year scenarios analyzed, VCMWD also would not anticipate any shortages in single years through 2020. The following tables provide a comparison of a single dry year water supply with projected total water use over the next 25 years, in five-year increments.

Table 4-14. Projected Single-Dry Year Water Supplies, ac-ft/year (DWR Table 43)

Category	2010	2015	2020	2025
Total Supply	47,487	49,710	41,731	39,350
Percent of projected normal	109%	116%	108%	108%

Table 4-15. Projected Single-Dry Year Water Demand – ac-ft/yr (DWR Table 44)

Category	2010	2015	2020	2025
Total demand	47,487	49,710	41,731	39,350
Percent of projected normal	109%	116%	108%	108%

A comparison between the dry year water supplies and demands can be found in Chapter 7.

4.11.2 Projected Multiple-Dry Year Water Supply and Demand

This section describes the impact of a multiple dry year period for each 5-year period during the 20-year projection. Because no shortages are anticipated within the SDCWA's service area in the dry-year scenarios analyzed, VCMWD also would not anticipate any shortages in single or multiple dry years through 2025. Table 4-16 shows VCMWD's multiple dry year assessment, summarizing the District's total anticipated multiple dry year water demands along with the supplies projected to be available to meet these demands. Tables 4-17 through 4-20 provide an estimate of the projected multiple-dry year water supplies for each 5-year period.

Table 4-16. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2010 (DWR Table 46)

Water Supply Sources	2006	2007	2008	2009	2010
Total supply	51,576	47,859	47,739	47,611	47,487
Percent of normal year supply	117%	109%	109%	109%	109%

Units of Measure: ac-ft/yr

Table 4-17. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2015 (DWR Table 49)

Water Supply Sources	2011	2012	2013	2014	2015
Total supply	47,932	48,376	48,821	49,265	49,710
Percent of normal year supply	110%	111%	113%	114%	116%

Units of Measure: ac-ft/yr

Table 4-18. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2020 (DWR Table 52)

Water Supply Sources	2016	2017	2018	2019	2020
Total supply	48,114	46,518	44,922	43,327	41,731
Percent of normal year supply	114%	113%	112%	110%	108%

Units of Measure: ac-ft/yr

Table 4-19. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2025 (DWR Table 55)

Water Supply Sources	2021	2022	2023	2024	2025
Total supply	41,255	40,778	40,302	39,826	39,350
Percent of normal year supply	108%	108%	108%	108%	108%

Units of Measure: ac-ft/yr

Table 4-20. Projected Demand Multiple-Dry Year Period Ending in 2010 - ac-ft/yr (DWR Table 47)

	2006	2007	2008	2009	2010
Demand	51,576	47,859	47,739	47,611	47,487
% of projected normal	117%	109%	109%	109%	109%

Table 4-21. Projected Demand During Multiple-Dry Year Ending in 2015 – ac-ft/yr (DWR Table 50)

	2011	2012	2013	2014	2015
Demand	47,932	48,376	48,821	49,265	49,710
% of projected normal	110%	111%	113%	114%	116%

Table 4-22. Projected Demand during Multiple-Dry Year Period Ending in 2020 – ac-ft/yr (DWR Table 53)

	2011	2012	2013	2014	2015
Demand	48,114	46,518	44,922	43,327	41,731
% of projected normal	114%	113%	112%	110%	108%

Table 4-23. Projected Multiple Dry Year Water Demand, ac-ft/yr, Period Ending in 2025 (DWR Table 56)

Water Supply Sources	2021	2022	2023	2024	2025
Total Demand	41,255	40,778	40,302	39,826	39,350
% of projected normal	108%	108%	108%	108%	108%

4.12 Water Supply Projects

The District has no current or planned future water supply projects or water supply programs. SDCWA completed a Regional Water Facilities Master Plan (RWFMP) process in 2004. The RWFMP defines the regional facilities needed to meet water demands within the SDCWA's service area through the year 2030. The SDCWA examined the changing water supply and demand forecast patterns using a probabilistic approach to facilities planning. A computer model analyzed various facility options under a range of supply and demand scenarios. This modeling resulted in an assessment of the reliability of the system measured in terms of the probability, frequency, and magnitude of water shortages for each facility option.

CHAPTER 5

RECYCLED WATER

Water recycling, defined as the treatment and disinfection of municipal wastewater to provide a water supply suitable for non-potable reuse, is an important component of southern California's water resources. Non-potable reuse is the term applied to recycled water used for non-drinking water purposes such as filling lakes, ponds, and ornamental fountains; irrigating parks, campgrounds, golf courses, freeway medians, community green belts, school athletic fields, crops, and nursery stock; controlling dust at construction sites; and recharging groundwater basins.

Recycled water can also be used in certain industrial processes and for flushing toilets and urinals in nonresidential buildings. However, current regulations allow only new buildings to be dual-plumbed for this specific use. Additional uses for recycled water are being identified and approved as local agencies, regulators, and customers become comfortable with its use.

The purpose of this chapter is to provide information on recycled wastewater and its potential for use as a water resource in the District. The elements of the chapter are (1) the quantity of wastewater generated in the service area, (2) description of the collection, treatment, and disposal/reuse of that wastewater, (3) the current plans for water recycling, and (4) the potential for water recycling in the service area.

5.1 Recycled Water Plan Coordination

According to the SDCWA 2005 Urban Water Management Plan, about 11,474 acre feet of recycled water was reused within the SDCWA's service area during fiscal year 2005. Table 5-1 shows the estimated annual yields from SDCWA projects in 5-year increments, based on the implementation schedules provided by the member agencies and the likelihood of development.

Table 5-1. SDCWA Member Agency Projected Recycled Water Use (Normal Year – ac-ft/yr)

2005[a]	2010	2015	2020	2025	2030
11,474	33,644	40,598	45,459	46,368	47,430

[a] Based on FY 2005 totals.

The District is committed to expanding the use of recycled water over the next 20 years and beyond. ~~As discussed elsewhere in this report,~~ the District anticipates at some time, ~~possibly beyond the 2025 planning horizon of this report~~, expanding its water reuse with golf course and possibly agricultural irrigation with treated effluent from its existing Moosa Canyon Water Reclamation Facility (0.45 mgd) and Skyline Ranch (0.042 mgd) facilities. According to the 2002 Water Master Plan, the District is involved in the process of three major developments: Wood Valley Ranch (0.70 mgd), Orchard Run (0.75 mgd), and Live Oak Ranch (0.04 mgd). All three will be required to construct on-site wastewater treatment and disposal facilities. As inland discharge operations, the combined

flow of approximately 150,000 gpd will be reclaimed through irrigation to on-site agricultural operations, landscape, and golf course turf areas. It is expected that all three of these facilities will be constructed and in operation in the next three to five years, and are anticipated to reach full flow potential in 10 to 15 years. In addition to this, all other future wastewater treatment facilities will be inland discharge operations, with 100 percent of effluent being disposed of via some form of direct or indirect recycling.

These efforts will be limited by the pace of development, amount of wastewater available for treatment and reclamation, as well as by financial considerations, water quality and other regulatory issues, and by overall public acceptance.

The SDCWA is in the process of conducting studies that will identify opportunities to expand the region's use of recycled water. No other agencies are working on recycled water plan for the District's service area. Table 5-2 lists the agencies involved in reuse planning and each respective involvement.

Table 5-2. Agency Participation in Reuse Planning (DWR Table 32)

Participating Agencies	Role
SDCWA	Lead on Regional Recycled Water System Study (Completed in March 2002)
SDCWA	Lead on Regional Recycled Water System Study – Phase II (Scheduled for completion in December 2005)
Wastewater Agencies	N/A
Groundwater Agencies	N/A
Planning Agencies	N/A
Other	N/A

5.2 Wastewater Quantity, Quality, and Current Uses

Wastewater collection, transmission, treatment, and effluent disposal or water recycling are provided by VCMWD to developed areas within the District's boundaries. At the present time, the District owns and operates two wastewater treatment facilities: the Lower Moosa Wastewater Reclamation Facility and the Skyline Ranch Country Club Water Reclamation Facility. These two facilities are operating well within design capacities and consistently meet discharge standards.

5.2.1 Wastewater Generation

Table 5-3 shows the projected amounts of wastewater projected to be generated and collected in the Valley Center District from 2005 to 2025.

Table 5-3. Wastewater Generation and Collection Data (DWR Table 33)
Valley Center Municipal Water District

	2005	2010	2015	2020	2025
Wastewater generated in service area	1.683	2.033	2.283	2.483	2.683
Wastewater collected and treated in service area[1]	0.41	1.04	1.42	2.07	2.07
Quantity that meets recycled water standard	0.05	0.46	0.71	1	1

Unit of Measure: Million Gallons per Day

[1]The majority of wastewater is treated through individual septic systems.

5.2.2 Lower Moosa Wastewater Reclamation Facility

The Lower Moosa Wastewater Reclamation Facility (Moosa) provides sewer treatment services for 2,264 customers in the District's Interstate 15 corridor area, from the Lawrence Welk development on the southern end, east to Hidden Meadows, and north to Circle R Drive. Ultimate capacity requirements for the service area are projected to be 1.0 mgd or 5,000 Equivalent Dwelling Units (EDUs).

Moosa can currently reliably treat and dispose of 0.45 mgd. Estimated recycled water quantities for 2005 are 395 ac-ft/year. At this time, disposal of effluent is accomplished by indirect reclamation via discharge to ponds percolating to the San Luis Rey River basin.

An expansion project for the Lower Moosa Wastewater Reclamation Facility was completed in August 2000, with improvements consisting of a covered aerobic digester, enclosed mechanical de-watering and sludge storage facilities, odor control facilities, and a Supervisory Control and Data Acquisition (SCADA) System. With these improvements, the plant's reliable treatment capacity was increased to a capacity of 0.450 mgd or 2,250 EDUs, regardless of weather conditions which had previously impacted sludge processing.

Based on an estimated build-out of 50 EDUs per year, current plant capacity should be sufficient for at least 20 years. Recent connection history, however, indicates that the actual build-out rate may be lower, which would not only further delay the need for additional capacity, but would also delay the requirement to initiate direct reclamation of the treated effluent. At this point, it is anticipated that maintenance requirements, rather than expansion needs, will drive the timing of future plant improvements.

It is anticipated that flow rates above 0.450 mgd may require additional treatment to meet effluent disposal requirements. These improvements may involve adding fine-bubble diffusers to the aeration basins, denitrification, and/or improving effluent quality to full California Department of Health Services Title 22 standards, resulting in an effluent suitable for irrigation of nearby golf courses and agricultural operations.

5.2.3 Skyline Ranch Country Club Reclamation Facility

The Skyline Ranch Country Club Reclamation Facility (Skyline) serves 222 customers and has a design treatment capacity of 0.025 mgd, with actual flows in the range of 0.016 mgd to 0.023 mgd and averaging 0.0203 mgd. Effluent from the Skyline plant is currently disposed of by spray irrigation.

Discussions are currently underway exploring the potential for possible future treatment process upgrades for reclaimed water irrigation on the Skyline Ranch Country Club Golf Course. Such a change in disposal method is speculative at this point and would, of course, require approval by the San Diego Regional Water Quality Control Board. This activity would involve using recycled water in the watershed above Lake Wohlford, which is a domestic drinking water source for the City of Escondido.

5.2.4 Wastewater Collection and Treatment

Planned disposal methods and quantities are presented in Table 5-4.

Table 5-4. Disposal of Wastewater (ac-ft/yr) (DWR Table 34)

Method of Disposal	Treatment Level	2005	2010	2015	2020	2025
Groundwater Re-use (Lower Moosa)	Advance Secondary	395	650	800	1,200	1,200
Golf Course, Agricultural and Landscaped Irrigation (Woods Valley, North Village, Lilac Ranch, Live Oak, Orchard Run)	Tertiary	60	520	790	1,120	1,120
Total	-	455	1,170	1,590	2,320	2,320

5.3 Future Wastewater Treatment and Reclamation Facilities

At this time there are several approved developments for construction of wastewater treatment and reclamation facilities, including:

- **Woods Valley Ranch Residential and Golf Course Development -** As approved, this 280-unit Specific Plan Area development will reclaim 100 percent of the 0.07 mgd tertiary treated effluent originating from the project as well as several surrounding and adjacent properties. The effluent will be used to irrigate the 18-hole golf course which is part of the approved development. Seasonal storage will be in on-site storage ponds.

- **Live Oak Ranch Development -** This 150-unit residential development will utilize a tertiary facility to treat 100 percent of the project's maximum effluent flow of 0.038 mgd to irrigate an active citrus grove which is currently part of the project site. Seasonal storage will be on the project site.

- **Orchard Run Development –** The 300-unit Orchard Run development will produce 0.075 mgd, which will be tertiary treated and used to irrigate landscaping and open space areas on the development.

- **Lilac Ranch Development –** This tertiary treatment facility will serve a 330 unit residential development. The treated water will be used on agricultural and landscaped areas on the development site.

- **North Village Water Reclamation Facility –** This tertiary treatment facility will serve up to 1,000 residential and commercial units located within the planning area designated in the North Village area.

Figure 5-1 shows the locations of the District's existing and planned wastewater facilities.

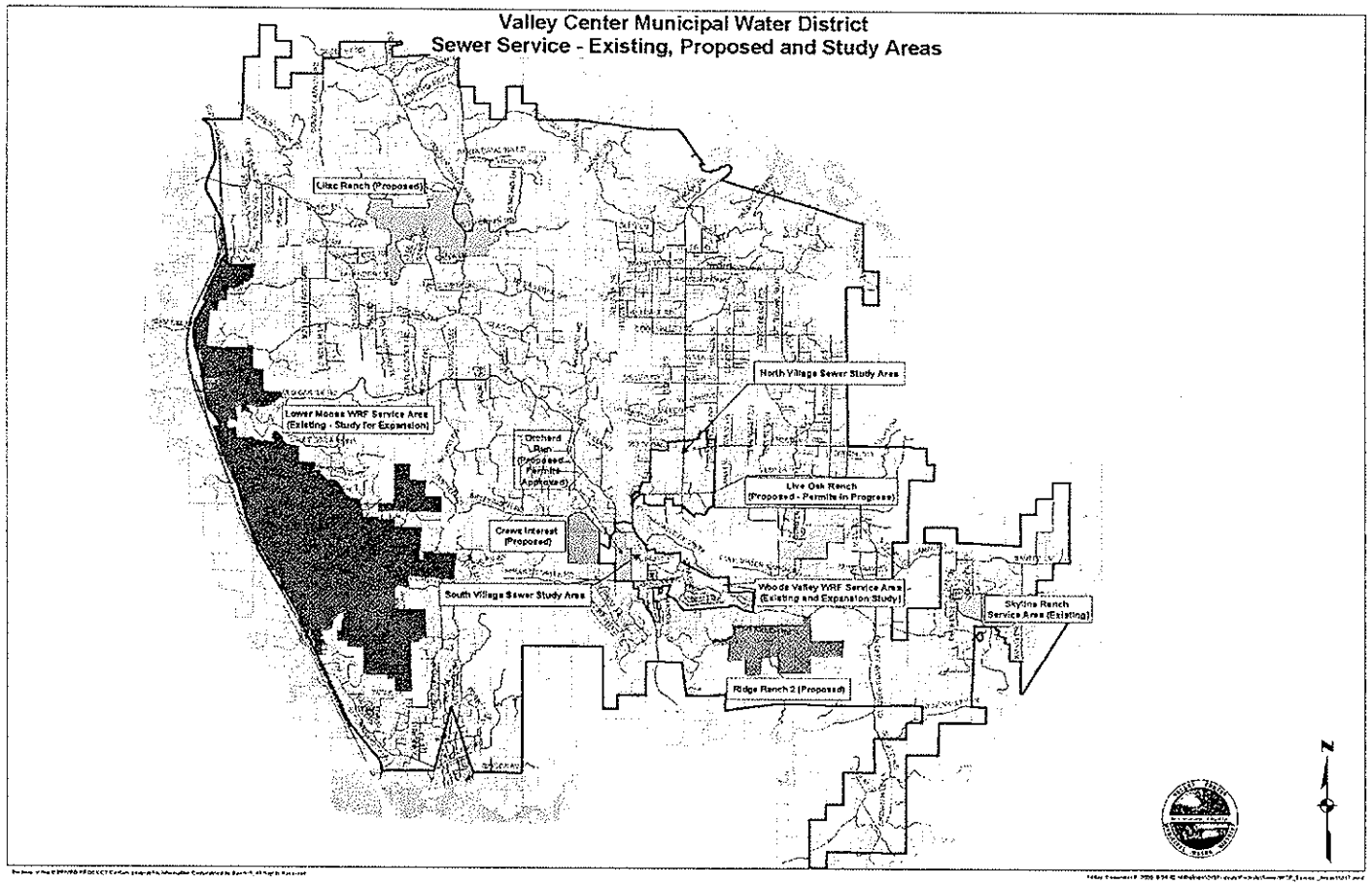


Figure 5-1. Locations of Existing and Planned Wastewater Facilities

5.4 Water Recycling Current and Future Uses

For some time now, VCMWD has anticipated delivering recycled water from the Moosa plant to the nearby Lawrence Welk and Castle Creek Golf Courses. However, as the two golf courses currently use well water for irrigation, recycled water proceeds to the District would be limited to the cost of delivery. The point at which reclamation at the Moosa facility is expected to be required to meet discharge requirement is at or beyond the planning horizon of this report (year 2025).

In May of 1990, VCMWD adopted Ordinance No. 201, the Mandatory Reclaimed Water Use Ordinance. This ordinance, which was updated in February 1998, requires that wherever there is the potential for current or future reclaimed water use, new developments will be required to install the facilities necessary to facilitate reclaimed water use. Developments in the vicinity of the Moosa plant are required to evaluate the feasibility of utilizing reclaimed water for landscape irrigation. If reuse is determined to be feasible, then these developments are required to install on-site facilities to accept reclaimed water if and when it will be available.

At this time, and for the foreseeable future, the District's service territory cannot be connected to an ocean outfall. Flow increases at the Moosa facility will ultimately exceed the downstream percolation capacity, requiring future development to construct direct reclamation facilities. There is interest by the owners of the Skyline Ranch Country Club in having the treated effluent, which is currently being spray irrigated, placed on the development's golf course.

As previously discussed, there are several large developments within the District's service area which will ultimately construct and operate wastewater treatment and reclamation facilities within the planning horizon of this report including Woods Valley Ranch Project (280-unit SPA), Live Oak Ranch (150 units), and Orchard Run Development (300-unit SPA).

With respect to future wastewater flows, all effluent generated by new development will, of necessity, be reclaimed. This is the case for all projects currently in the land-use approval process/development process. Of the three major projects currently in process, all effluent will be treated to tertiary standards and reclaimed on the specific project site. In summary, all future wastewater flows will, by necessity, be 100 percent reclaimed, which obviates the need for optimization or incentive plans.

While the Woods Valley Ranch Project is well underway, expansion of the facility and thus the level of reclamation will depend upon the pace of the development of the Orchard Run Development as well as the affordability of wastewater services for the surrounding, smaller properties and developments. Other critical factors will be securing seasonal storage and disposal sites to serve the full potential for the area.

Information on existing and potential recycled water users is summarized in Tables 5-5 and 5-6.

Table 5-5. Existing Recycled Water Uses (DWR Table 35a)

Type of Use	Treatment Level	2004 ac-ft
Agriculture	--	0
Landscape[1]	Tertiary	0
Wildlife habitat	--	0
Wetlands	--	0
Industrial	--	0
Groundwater recharge[1]	Advance Secondary	395
Total	--	395

Unit of Measure: Acre Feet per Year

[1] Lower Moosa Canyon

Table 5-6. Projected Acre Feet Results of Recycled Water Valley Center Municipal Water District (DWR Table 36)

Recycled Water Customer	2010	2015	2020	2025
Agricultural[1]	225	345	585	585
Landscape[2]	295	445	535	535
Wildlife Habitat	-	-	-	-
Wetlands	-	-	-	-
Industrial	-	-	-	-
Groundwater Recharge[3]	650	800	1,200	1,200
Total Projected Use of Recycled Water:	1,170	1,590	2,320	2,320

Unit of Measure: Acre Feet per Year

[1]Includes Live Oak Ranch Development and North Village Water Reclamation Facility

[2]Includes Woods Valley Ranch Golf Course, Lilac Ranch Development, and Orchard Run Development

[3]Includes Lower Moosa

Table 5-7 presents the differences between 2000 projections and 2005 actual numbers. Agricultural recycled water use has not begun within the District. Landscaped projections were close to actual numbers, while actual groundwater recharge was higher then projected numbers.

Table 5-7. Recycled Water Uses –
2000 Projection Compared with 2005 Actual (DWR Table 37)
Valley Center Municipal Water District

Recycled Water Customer	2000 Projection for 2005[3]	2005[4]
Agricultural[1]	14.5	0
Landscape[2]	56	60
Wildlife Habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater Recharge	336	395
Total:	406.5	0

Unit of Measure: Acre Feet per Year

[1] Live Oak Ranch Development

[2]Includes Woods Valley Ranch Golf Course and Orchard Run Development

[3]VCMWD 2000 UWMP Projection

[4]Actual per VCMWD Recycled Water Project Summaries

5.5 Encouraging Use of Recycled Water

The Act requires agencies to describe their actions, including adopted policies and financial incentives, which may be taken to encourage the use of recycled water. This section describes efforts taken by regional agencies (SDCWA, MWD) as well as by the VCMWD to encourage and expand the use of recycled water.

5.5.1 Regional Efforts

Table 5-8 summarizes a list of the programs used by the SDCWA's member agencies to assist and encourage development of recycled water uses. Brief descriptions of the major programs are also included. Some of these programs are developed by the water recycling agencies while others, such as the funding programs, are primarily provided by the SDCWA, MWD, and state and federal agencies.

Table 5-8. Programs to Encourage Recycled Water Use

Incentive Programs
Reclaimed Water Development Fund (SDCWA)
Local Resources Program (MWD)
Grants
Title XVI Funding Program (Bureau of Reclamation)
Proposition 13 Grant (State of California)
Low Interest Loans
Financial Assistance Program (SDCWA)
State Revolving Fund (State of California)
Water Reclamation Loan Program (State of California)
Proposition 13 Loan (State of California)
Long-Term Contracts (Price/Reliability)
Rate Discounts
Public Education/Information
Regional Planning
Model Water Reclamation Ordinance
Dual Plumbing Standards
Prohibits Specific Potable Water Uses
Guidance Documents
Model Rules and Regulations for Recycled Water Service
Construction Specifications for Recycled Water Systems
Recycled Water Retrofit Guidelines
Recycled Water User's Manual

5.5.2 Funding Programs

The capital intensive cost of constructing recycled water projects has traditionally been a barrier to project implementation. The up-front capital cost for construction of treatment facilities and recycled water distribution systems can be expensive, while full market implementation is usually phased in over a number of years, thus affecting the cash flow in the early project years. This situation is compounded by the seasonal nature of recycled water demands. Recycled water demands tend to peak during the hot summer months and drop off during the winter months when landscape irrigation demands are low. Projects that serve a large portion of irrigation demands, like the majority of the projects in the SDCWA's service area, often utilize only half of their annual production capacity due to these seasonal demand patterns. The costs of these projects tend to be higher than those of projects that serve year-round demands, since the project facilities must be sized to accommodate seasonal peaking. Projects that serve mostly irrigation demands also tend to have less stable revenue bases, since irrigation demands are heavily influenced by hydrologic conditions.

To be financially feasible, a project's benefits must offset or exceed its associated costs. Agencies developing recycled water projects must be able to quantify these benefits in order to determine the economic feasibility of a project. Project benefits can take the form of:

1. Revenues from the sale of recycled water;
2. Increased supply reliability;
3. Increased control over the cost of future water supplies;
4. Avoided water and wastewater treatment, storage, and conveyance costs; and
5. Financial incentives from the SDCWA, MWD, and federal and state agencies.

When the long-term economics are considered along with the increased supply reliability, water recycling can be a viable option.

As diversified funding options can be significant in the success of a water recycling project, the SDCWA has focused on providing and facilitating the acquisition of outside funding for water recycling projects as a very high priority. Several funding programs detailed in this section are critical success factors in the implementation of water recycling in San Diego County.

A number of financial assistance programs are available to San Diego County agencies including: the SDCWA's Financial Assistance Program (FAP) and Reclaimed Water Development Fund (RWDF); MWD's Local Resources Program (LRP); the USBR Title XVI Grant Program; and the SWRCB low-interest loan programs. Together, these programs offer funding assistance for all project phases, from initial planning and design to construction and operation.

5.5.2.1 Financial Assistance Program. As an impetus to begin local projects, SDCWA offers the FAP to encourage, through the provision of matching funds, facility planning, feasibility investigations, preliminary engineering studies, environmental impact reports, and research projects related to water recycling and groundwater development. Agencies receiving FAP funds are required to reimburse the SDCWA when implementation of the project results in funding from other sources, such as the LRP or RWDF, or within five years of certification of the project environmental report, whichever occurs first.

5.5.2.2 Reclaimed Water Development Fund. In response to significant up-front costs of many water recycling projects, the RWDF, adopted by the SDCWA's Board of Directors in April 1991, contributes up to $100/ac-ft of beneficial reuse for recycling projects that demonstrate a financial need. This contribution is to offset costs, especially in the early years of project start-up. In order to qualify, project expenses must exceed project revenues. To date, the SDCWA has entered into RWDF agreements for ten projects with a combined ultimate yield of 32,000 ac-ft/yr.

5.5.2.3 Local Resources Program. MWD also has a program that currently underwrites local projects during the initial years of operation. MWD's local resources program provides subsidies of up to $250/AF for recycled water and groundwater development projects.

The Reclamation Wastewater and Groundwater Study and Facilities Act - Title XVI. The Title XVI Grant Program is a significant source of funding for San Diego area recycling projects. Title XVI of Public Law 102-575, the Reclamation Wastewater and Groundwater Study and Facilities Act, authorizes the federal government to fund up to 25 percent of the capital cost of authorized recycling projects, including the San Diego Area Water Reclamation Program, an inter-connected system of recycling projects serving the MWD Sewage System service area. PL104-266, the Reclamation Recycling and Water Conservation Act of 1996, authorized two additional projects in northern San Diego County: the North San Diego County Area Water Recycling Project and the Mission Basin Brackish Groundwater Desalting Demonstration Project.

5.5.2.4 State Revolving Fund/Water Reclamation Loan Program. The State Revolving Fund (SRF) and the Water Reclamation Loan Program (WRLP) provide agencies with low-interest construction loans for water recycling and groundwater projects. The SRF and WRLP loans carry an interest rate equal to 50 percent of the state's general obligation bond interest rate. This below-market interest rate can result in substantial savings on debt service. In November 1996, Proposition 204 was approved by the voters and provided $80 million for the SRF and $60 million for WRLP. Proposition 13, approved by the voters in March 2000, provides an additional $40 million for low-interest loans and grants for design and construction of water recycling projects to the existing water recycling funding program. Combining this with loan repayments from prior loans and funds remaining from Proposition 204, over $100 million is available.

5.6 SDCWA Policies, Ordinances, and Guidance Documents

The SDCWA has adopted a number of policies, guidance documents, and a model ordinance to assist local agencies with water recycling project implementation. Many local agencies, including VCMWD, have adopted the SDCWA-sponsored ordinance. The ordinance includes provisions that typically require new development projects to install recycled water systems. The ordinance also states that where allowed by law and available in sufficient quantities, at a reasonable cost and quality, recycled water shall be the sole water supply delivered for non-potable uses.

Water recycling guidance documents available from the SDCWA include: Model Rules and Regulations for Recycled Water Service, Construction Specifications for Recycled Water Systems, Retrofit Guidelines, and a Recycled Water User's Manual.

5.6.1 SDCWA Training Opportunities

Understanding similarities and differences between recycled and potable water is important to the successful operation of a recycled water system. The SDCWA, in partnership with other water agencies, offers a one-day certification course designed to provide irrigation supervisors with a basic understanding of recycled water. The class provides information to supervisors on the water recycling process, recycled water quality and safety issues, the duties and responsibilities of the supervisor, landscape irrigation fundamentals, maintenance and management, and cross connection control shut-down tests and inspections. Instructors include a state registered environmental health specialist and environmental assessor, water quality chemist/reclamation specialist, and landscape specialists. Completion of the Recycled Water Site Supervisor Training fulfills the training requirement as mandated by regulatory authorities.

5.7 VCMWD Commitment to Recycled Water Use

In May 1990, VCMWD adopted Ordinance No. 201, which set forth the policy of mandatory reclaimed water use wherever feasible. This ordinance was updated during the adoption of the District's Administrative Code Section establishing the agency's reclaimed water rules and regulations. Along with these policy statements is the realization that the VCMWD service area is now currently, and will be for the foreseeable future, isolated from an ocean outfall. All future development, which includes wastewater treatment, will also require100 percent inland discharge via landscape or agricultural reclamation. With no ocean discharge option, there is little or no alternative other than to develop some form of reclamation for beneficial uses within the VCMWD service area.

With this in mind, the VCMWD Board has directed its staff to work with proponents of potential wastewater systems, including private interests as well as other governmental entities, to develop effective reclaimed water use plans for their respective projects. District staff has also been directed to facilitate the inclusion of near or adjacent properties in the wastewater development plans of the larger developments.

Finally, the Board has followed a policy of agreeing to ultimately accept ownership, operation and maintenance of the facilities meeting all of the District's engineering, operational, and financial requirements.

Actions used by the District to encourage recycled water use are summarized in Table 5-9.

Table 5-9. Actions Used to Encourage Recycled Water Use (DWR Table 38)

Actions	Acre Feet of Use Projected to Result From This Action			
	2010	2015	2020	2025
Dual Plumbing Standards	N/A*	N/A*	N/A*	N/A*
Sub-Regional Planning	N/A*	N/A*	N/A*	N/A*
Long-Term Contracts (Price/Reliability)	N/A*	N/A*	N/A*	N/A*
Rate Discounts for Agricultural Use	N/A*	N/A*	N/A*	N/A*
Public education/information	N/A*	N/A*	N/A*	N/A*
Mandatory recycled water use where feasible	N/A*	N/A*	N/A*	N/A*
Long-term Contracts	N/A*	N/A*	N/A*	N/A*
Participation in Regional Planning	N/A*	N/A*	N/A*	N/A*
Total	N/A*	N/A*	N/A*	N/A*

*At this time and the foreseeable future, VCMWD is an inland discharger of recycled water. By definition, all wastewater either flows to septic systems or will be recycled.

5.8 Optimizing the Use of Recycled Water

5.8.1 Regional Perspective

The SDCWA is conducting a "Regional Recycled Water System Alternatives Analysis (Regional Recycling Study – Phase II)" which will identify opportunities to expand the region's recycled water projects and develop a regional system or systems that could maximize reuse on a regional scale. This study, scheduled for completion at the end of 2005, will identify strategies to overcome identified obstacles to water recycling; develop a marketing plan and regional strategies to market recycled water to target industries and customers; investigate and examine to what extent – and levels – TDS in source water affect the use and application of recycled water for local end-users; research and identify the impediments to the implementation of water repurification projects; and funnel planning grant funding to regional agencies to further expand the use of recycled water.

The USBR completed a similar study, on a much larger study area, called the "Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS)." The SCCWRRS was published in March 2000. The SDCWA's Regional Recycling Study will build on work from SCCWRRS and has a more focused and detailed objective than SCCWRRS. The two studies will be closely coordinated and the SDCWA's Regional Recycling Study will utilize the data previously collected for the SCCWRRS.

CHAPTER 6

WATER CONSERVATION BEST MANAGEMENT PRACTICES

Water conservation, or demand management, continues to be a significant part of regional water resource planning strategies in San Diego County. The District is committed to supporting these regional water conservation activities, and in many cases, provides indirect or direct financial assistance. In addition, the District implements local water conservation management measures to augment and complement these regional programs.

The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the DWR, water utilities, environmental organizations, and other interested groups to develop a list of urban BMPs for conserving water. This consensus-building effort resulted in a Memorandum of Understanding Regarding Urban Water Conservation in California, which formalizes an agreement to implement these BMPs and makes a cooperative effort to reduce the consumption of California's water resources. The BMPs as defined by the Memorandum of Understanding (MOU) are presented in Table 6-1. The BMPs as defined in the MOU are generally recognized as standard definitions of water conservation measures. The MOU is administered by the CUWCC. The District is currently an MOU signatory. A copy of 2003-2004 BMP Activity Reports are included in Appendix D.

The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for that BMP.

Table 6-1. Water Conservation Best Management Practices

No.	BMP Name
1.	Water survey programs for single-family residential and multi-family residential connections
2.	Residential plumbing retrofit
3.	System water audits, leak detection and repair
4.	Metering with commodity rates for all new connections and retrofit of existing connections
5.	Large landscape conservation programs and incentives
6.	High-efficiency washing machine rebate programs
7.	Public information programs
8.	School education programs
9.	Conservation programs for commercial, industrial, and institutional accounts
10.	Wholesale agency assistance programs
11.	Conservation pricing
12.	Conservation coordinator
13.	Water waste prohibition
14.	Residential ULFT replacement programs

6.1 Current Water Conservation Program

The District conducts an ongoing water conservation program. A description of each BMP that is currently being implemented or scheduled for implementation, a schedule of implementation, and a method to evaluate effectiveness is provided in this section. The existing conservation savings are also discussed.

6.1.1 BMP 1. Water Survey Programs For Single-Family Residential And Multi-Family Residential Connections

Water survey programs for single-family residential and multi-family residential connections consist of annual water audits, water use reviews, and surveys of past program participants. Audits are conducted by trained auditors and include installation of low flow devices. Audits identify water-use problems, recommend repairs, provide instruction in landscape principles, irrigation timer use and, when appropriate, meter reading. Customers are provided with information packets that include the evaluation results and water savings recommendations. The District's targeting and marketing strategy consists of community outreach events approximately three times a year at which the District has sign-ups for the Water Wise program. This survey program is conducted annually and began in 1995.

6.1.2 BMP 2. Residential Plumbing Retrofit

Plumbing retrofit of existing residential accounts consists of providing low flow showerheads, faucet aerators, and toilet leak detection tablets to customers. The District works with local programs and businesses to offer free water conservation information and materials to residents. There is not an enforceable ordinance in effect in the service area requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts. The District has reached 75 percent saturation. It is estimated that 90 percent of single-family households have low-flow showerheads. The low-flow device distribution program started in July 1996.

6.1.3 BMP 3. System Water Audits, Leak Detection and Repair

A system water audit, leak detection and repair program consists of on-going leak detection and repair within the system, focused on the high probability leak areas. The District's pipelines are monitored for leaks with the use of a sophisticated leak detection listening device. Leaks can be detected early and are repaired in a timely manner. In addition, throughout the workday, the District's pipelines are traveled to access facilities and any sign of a potential leak is reported and further investigated. All meters are read on a monthly basis. Leak detection is on-going.

6.1.4 BMP 4. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

All District customers receive water through metered connections that bill by volume of usage. The District has not conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters.

6.1.5 BMP 5. Large Landscape Conservation Programs and Incentives

Potential customers are pre-screened by review of water usage data records as compared to typical patterns of SIC water usage. Customers that exhibit unusually high water usage relative to the size of the property are sent a letter and a program brochure, inviting them to participate in the program. Surveys include an irrigation system check, distribution uniformity analysis, review or development of an irrigation schedule, measurement of the landscape area, measurement of the total irrigable area, and a report and information provided for the customer. All customers receive an offer for a follow up survey.

The District does offer financial incentives such as vouchers. The District also provides landscape water use efficiency information to new customers and customers changing services. Workshops are held on irrigation management and Water-Wise Plant identification free of charge. Water-wise plants and the xeriscape principle are promoted through lobby displays, brochures, and at community event. The District does have water-efficient irrigated landscaping at the District facilities. This program began in 1990 and is conducted annually.

6.1.6 BMP 6. High-efficiency Washing Machine Rebate Programs

The District participates and promotes the High-Efficiency Washing Machine voucher program funded by the District and its wholesale water suppliers, MWD and SDCWA. Customers can obtain a voucher with a value of $125.00 off the purchase price of a High-Efficiency Washer. The voucher is for a point of purchase discount. San Diego Gas and Electric, a local energy provider, offers rebates upon the purchase of selected high-efficiency washing machine models available on a first-come, first-served basis.

6.1.7 BMP 7. Public Information Programs

Public information is an ongoing component of the District's water conservation program. Literature and brochures on water conservation and efficient landscapes are free to customers and are readily available. The information is geared towards all age groups and includes children's coloring books on water-wise use, water cycle and the history and source of our water supply. Extensive information on conservation practices is available on the District's web page along with links to conservation programs and a library of appropriate planting for the region. Water conservation is promoted through interactive games and distribution of information at events such as the May Water Awareness Celebration. Water workshops have been offered to customers in

which participants receive hands-on experience and lessons on landscape sprinkler systems and landscape maintenance. The District's Water News newsletter is distributed to customers via an insert in the water bills. A display of xeriscape principles and water efficient plants is located in the District's main lobby. The District's public information program is an ongoing, annual program.

6.1.8 BMP 8. School Education Programs

School education is an ongoing component of the District's water conservation program. The District uses SDCWA resources to implement this BMP along with the Water Education Program incorporated into the 6th grade Science and Geography curriculums and Water Education Program/Poster Contest for the 4th grade. Grade-appropriate materials are distributed to Grades K through 8th and high school. The District's school education program is an ongoing, annual program. The District began implementing this program in the year 1992.

6.1.9 BMP 9. Conservation Programs for Commercial, Industrial, and Institutional Accounts

Description: The District has identified and ranked commercial, industrial, and institutional customers according to use. The program does not include surveys of past program participants to determine if audit recommendations were implemented. This program does not include incentives related to the use of efficient water-use technologies. The District tracks CII program interventions and water savings and documents and maintains records on how savings are realized. This program is conducted annually.

6.1.10 BMP 10. Wholesale Agency Assistance Programs

This BMP is not applicable to the District because the District is not a wholesale agency.

6.1.11 BMP 11. Conservation Pricing

The District currently implements non-volumetric sewer rates and uniform water rates for all of its customers. Uniform quantity charge is considered to meet the definition of conservation pricing. A discussion of the account types that apply to the District. The implementation of this BMP is ongoing.

6.1.12 BMP 12. Conservation Coordinator

A conservation coordinator is an on-going component of the District's water conservation program. The conservation coordinator is responsible for implementing and monitoring the District's water conservation activities. A Conservation Coordinator has been selected and is in place. The conservation coordinate is Kathy Stetson, who is the Conservation Coordinator for 12 percent of the time and the executive assistant/board secretary for the rest of the time. She has promoted and administered conservation programs since 1991. The implementation of this BMP is ongoing. The position was started in 1991.

6.1.13 BMP 13. Water Waste Prohibition

Water waste prohibition is an ongoing component of the District's water conservation program. This District has adopted its own set of water conservation regulations.
A copy of the District's regulations is provided in Appendix E. Chapter 7 of this plan provides a description of the prohibited water uses in District's water waste regulations. The implementation of this BMP is ongoing.

6.1.14 BMP 14. Residential ULFT Replacement Programs

The District participates in a County-wide program in which participating residential customers are offered a voucher redeemable with local plumbing dealers for up to $75 off the purchase price of an ultra-low flush toilet. The voucher is for a point-of-purchase discount only and eligibility requires replacement of an existing toilet that is 3.5 gallons per flush or more. No after-purchase rebates are available. The program is conducted annually.

6.2 Economic Analysis Results

All pertinent Demands Management Measures (DMMs) were implemented in the District. Therefore, an evaluation of each DMM not being implemented is not necessary.

6.3 Additional Issues

This section describes additional issues required to be addressed by the Urban Water Management Planning Act. Non-economic factors, including environmental, social, health, customer impacts, and technological are not thought to be significant in deciding which BMPs to implement. There are no planned water supply projects that would provide water at a higher unit cost. The District has the legal authority to implement the BMPs.

CHAPTER 7

WATER SUPPLY VERSUS DEMAND COMPARISON

This chapter provides a comparison of projected water supplies and demand and water shortage expectations. The Act requires that urban water agencies conduct a water shortage contingency analysis as part of their 2005 plan. This section includes the District's analysis, which addresses a catastrophic shortage situation as well as drought management.

Because of the recent occurrence of prolonged drought periods affecting the District's customers, the District is well prepared to implement both voluntary and mandatory conservation provisions when necessary. Conservation measures adopted during the two most recent drought periods proved effective, and many are contained in the Urban Water Shortage Contingency Plan adopted by the District in January 1992. The District's drought and emergency management measures are designed to deliver necessary water savings, while minimizing, to the extent possible, any negative effects on the lifestyles and economic basis of the District's customers.

7.1 Current and Projected Water Supplies vs. Demand

This section provides a comparison of normal, single-dry, and multiple dry water year supply and demand for the District. Water demands are addressed in Chapter 3; water supply is addressed in Chapter 4; and recycled water supply is addressed in Chapter 5 of this Plan. It is assumed that supplies will always equal demand.

7.1.1 Current and Projected Normal Year Water Supplies vs. Demand

The normal water year current and projected water supplies are compared to the current and projected demand for the District in Table 7-1.

Table 7-1. Normal Year Water Supply and Demand Comparison, ac-ft/yr (DWR Table 42)

	2010	2015	2020	2025
Supply totals	43,736	43,029	38,462	36,287
Demand totals	43,736	43,029	38,462	36,287
Difference (supply minus demand)	0	0	0	0
Difference as a percent of supply	0%	0%	0%	0%
Difference as a percent of demand	0%	0%	0%	0%

Units of Measure: ac-ft/yr

Source: SDCWA

7.1.2 Current and Projected Single-Dry Year Water Supplies vs. Demand

The current and projected water supplies are compared to the demands for a single dry year for the District in Table 7-2.

Table 7-2. Single-Dry Year Water Supply and Demand Comparison, ac-ft/yr (DWR Table 45)

	2005	2010	2015	2020	2025
Supply totals	48,107	47,487	49,710	41,731	39,350
Demand totals	48,107	47,487	49,710	41,731	39,350
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%

Units of Measure: ac-ft/yr

7.1.3 Projected Multiple-Dry Year Water Supplies vs. Demand

The projected water supplies are compared to the demands for multiple dry years for the District in Tables 7-3 through 7-6.

Table 7-3. Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2010 (DWR Table 48)

	2006	2007	2008	2009	2010
Supply totals	51,576	47,859	47,739	47,611	47,487
Demand totals	51,576	47,859	47,739	47,611	47,487
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%

Units of Measure: ac-ft/yr

Table 7-4. Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2015 (DWR Table 51)

	2011	2012	2013	2014	2015
Supply totals	47,932	48,376	48,821	49,265	49,710
Demand totals	47,932	48,376	48,821	49,265	49,710
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%

Units of Measure: ac-ft/yr

Table 7-5. Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2020 (DWR Table 54)

	2016	2017	2018	2019	2020
Supply totals	48,114	46,518	44,922	43,327	41,731
Demand totals	48,114	46,518	44,922	43,327	41,731
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%

Units of Measure: ac-ft/yr

Table 7-6. Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period Ending in 2025 (DWR Table 57)

	2021	2022	2023	2024	2025
Supply totals	41,255	40,778	40,302	39,826	39,350
Demand totals	41,255	40,778	40,302	39,826	39,350
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%

Units of Measure: ac-ft/yr

7.2 Water Shortage Expectations

Because the District is entirely dependent on imported water, the reliability of the District's water supply is particularly vulnerable to shortages due to unexpected interruptions to the delivery system or prolonged periods of drought. A catastrophic water shortage occurs when a disaster, such as an earthquake, eliminates access to imported water supplies or results in insufficient water available to meet the region's needs.

As discussed in this chapter, the District has taken several actions 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.

Because the District is entirely dependent upon the SDCWA for its water supply, the SDCWA's analysis is summarized herein as well.

7.3 Water Shortage Contingency Plan

As water is delivered from MWD to the SDCWA through two aqueducts, the severing of either of these lines due to earthquake or other natural disaster could cause portions of the SDCWA service area, including the VCMWD, to be without imported water supplies for as much as six months, resulting in severe hardship and economic loss. The SDCWA Emergency Response Plan is discussed in the following section.

7.3.1 SDCWA Emergency Response Plan

The SDWCA has developed an Emergency Response Plan (ERP) and an Emergency Storage Project (ESP) to prevent or minimize the damages caused by such an interruption in imported water supplies.

The ERP provides Authority staff with direction and strategies for responding to a crisis situation that results in severe damage to the SDCWA's water distribution system or impedes the SDCWA's ability to provide reliable water services to its member agencies. The ERP also describes the emergency situations and incidents that will trigger the activation of the SDCWA's ERP and Emergency Operations Center.

7.3.2 SDCWA Emergency Storage Project

In 1998 the SDCWA's Board approved implementation of the Emergency Storage Project to reduce the risk of potentially catastrophic damages that could result from a prolonged interruption of imported water due to earthquake, drought or other disaster. As described in Section 1.2.6 of the SDCWA's 2005 Urban Water Management Plan, the ESP is a system of reservoirs, pipelines and other facilities that will work together to store and move water around the county in the event of a

natural disaster. The facilities are located throughout San Diego County and are being constructed in phases. The entire project is expected to be complete by 2012. Its initial phase includes the recently completed 318-foot-high Olivenhain Dam and accompanying 24,364 AF Olivenhain Reservoir. When completed, the ESP will provide 90,100 AF of stored water for emergency purposes to meet the county's needs through at least 2030.

Under the ESP, the Authority will attempt to provide each member agency with a 75 percent level of service for M&I customers and a 50 percent level of service for agricultural customers, less the amount the member agency can self-provide from local sources. (In order to pay a reduced Special Agricultural Water Rate to the Authority, agriculture has agreed to a reduction in deliveries at twice the rate of system-wide demands during an emergency situation.)

7.3.3 Summary of SDCWA's Emergency Water Shortage Preparations

The shortage contingency analysis included as Section 9 of the SDCWA's 2005 Urban Water Management Plan and summarized herein demonstrates that the SDCWA and its member agencies, through the ERP and ESP, are taking actions to prepare for and appropriately handle a catastrophic interruption of water supplies. The SDCWA's Plan also describes actions being taken by the SDCWA to firm-up its supplies from MWD to provide increased reliability in a drought and reduce if not eliminate potential shortages.

The Authority does not currently have a shortage allocation plan. The Authority's last allocation plan was adopted in 1994 (Ordinance 94-3) and expired on December 31, 1995. With the majority of supplies within the region still imported from MWD it is difficult for the SDCWA to adopt a comprehensive shortage allocation plan without knowing the amount of supplies that will be available from Metropolitan in a shortage situation. Since the 1987-1992 drought, the Water Authority and its member agencies have developed plans and implemented projects to reduce reliance on a single supply source. While the region has plans to provide a high level of reliability, there will always be some level of uncertainty surrounding maintaining and developing local and imported supplies. Therefore, the Water Authority is developing a comprehensive Drought Management Plan (DMP) in the event that the region does face supply shortages due to drought conditions. The sections below describe the process to develop the DMP, achievements to date, and the schedule for completion.

In 1999, Metropolitan adopted the WSDM Plan to integrate planned operational actions with respect to both surplus and shortage situations. (For further details on the WSDM Plan actions, refer to Metropolitan's 2005 RUWMP.) The WSDM Plan final action, to be taken in an extreme shortage stage, is the implementation of an allocation plan. An allocation plan was not developed as part of the WSDM Plan, and it is not known when Metropolitan will consider and adopt such a plan. In developing the DMP described below, the Water Authority made assumptions regarding the Metropolitan supplies available during drought stages. The Water Authority will adjust the DMP as necessary following Metropolitan's adoption of an allocation plan.

7.3.4 District Water Shortage Contingency Plan

Pursuant to Assembly Bill 11 (First Extraordinary Session), amending Section 10631 of the Water Code to require an Urban Water Shortage Contingency Plan, VCMWD prepared an amended Urban Water Management Plan, including an Urban Water Shortage Contingency Plan, which was adopted by the VCMWD Board of Directors on January 20, 1992 by Resolution 1305. Many of the policies contained in the Contingency Plan are policies which were adopted by the VCMWD Board of Directors in 1991, in anticipation of continued drought. The operative provisions of the contingency plan, i.e., water shortage response, water use prohibitions, enforcement charges and penalties for excessive usage, are currently in place as part of the District's Administrative Code (Sections 230, 235, and 160). Sections 230 and 235 are included herein as Appendix E.

7.3.4.1 Stages of Action. The District's water shortage contingency plan is based on five stages as defined in Table 7-7.

Table 7-7. Water Shortage Contingency Plan Stages (DWR Table 23)

Stage	Water Supply Conditions	Percent shortage
Stage 1 – Normal Water Supply	Supplies available to meet all demands	10-15%
Stage 2 – Water Alert	Probability that supplies will not meet demands	20%
Stage 3 – Water Warning	Supplies will not be able to meet expected demands	30%
Stage 4 – Water Crisis	Supplies not meeting current demands	40%
Stage 5 – Water Emergency	Major failure of a supply, storage, or distribution system	50% and up

7.3.5 Three-Year Minimum Water Supply

The three-year minimum water supply is presented in Chapter 4. Results are summarized in Table 7-8 below.

Table 7-8. Estimated Minimum Water Supply, ac-ft/yr (DWR Table 24)

Source	2006	2007	2008	Normal
Purchased from Wholesaler	51,576	47,859	47,739	43,649
Recycled water	0	0	0	0
Water supply loss due to water quality	(0)	(0)	(0)	(0)
Supplier Produced Groundwater	0	0	0	0
Desalination water	0	0	0	0
Total	51,576	47,859	47,739	43,649

7.3.6 Catastrophic Supply Interruption Plan

As shown in Table 7-9, the District has taken several actions for preparation of, and implementation during, a catastrophic interruption of water supplies.

Table 7-9. Preparation Actions for a Catastrophe (DWR Table 25)

Possible Catastrophe	Summary of Actions
▪ Earthquake ▪ Fire/explosion ▪ Medical ▪ Flood ▪ Tornado/severe weather ▪ Bomb threat ▪ Hard freeze ▪ Loss of normal water supply ▪ Hazardous material release ▪ Contamination of District water supplies ▪ Terrorist attack	Command chain is defined that dispatches crews to inspect infrastructure and critical operations. Operations response crews assigned to monitor system operations and modify as necessary. Communication command chain is defined to coordinate with other local water agencies and emergency response officials as necessary. Criteria and procedures provided to return system to normal operations including initiating water quality testing when necessary and performing necessary emergency repairs to the system. Plan contains contact information for responsible parties and support services. Water shortage contingency plan stages will be implemented as required by the situation.

7.3.7 Prohibitions, Consumption Reduction Methods, and Penalties

Section 10632(d) of the Act states that an agency's urban water shortage contingency analysis shall include the following element: "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."

The District's Contingency Plan incorporates Article 230, "Water Conservation Program", adopted by the VCMWD on April 22, 1991 and Article 235, "Emergency Water Management Plan", adopted on February 19, 1991. These Articles, included herein as Appendix E, contain mandatory provisions to reduce water usage, and include prohibitions against specific wasteful practices. Table 8-4 indicates at which stages various prohibitions are considered Voluntary as opposed to Mandatory. Mandatory prohibition consumption reduction methods, and penalties in the District's water shortage contingency plan are presented in Appendix E and summarized below in Tables 7-10 through 7-12 to conform to the UWMP guidelines.

Table 7-10. Mandatory Prohibitions (DWR Table 26)

Prohibitions	Stage When Prohibition is Voluntarily Requested	Stage When Prohibition Becomes Mandatory
Street/sidewalk cleaning	All Stages	All Stages
Washing cars	Voluntary Reduction	Any Mandatory Stage
Watering lawns/landscapes	Voluntary Reduction	Any Mandatory Stage
Uncorrected Plumbing Leaks	All Stages	All Stages
Gutter Flooding	All Stages	All Stages

Table 7-11. Consumption Reduction Methods (DWR Table 27)

Examples of Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction
Demand Reduction Program	All Mandatory Stages	Demand reduction program would implement rates, charges and fines to affect the required level of reduction as determined by wholesale supplier.
Flow Restriction	Repeat Violations	Minimal impact.
Mandatory Percentage Reduction	All Mandatory Stages	As required by wholesale supplier.
Restrict for Only Priority Uses	Water Supply Interruption	MWD IAWP interruption would be at the 30% level initially and then at what ever level determined necessary by MWD.
Use Prohibitions	All Mandatory Stages	As required by wholesale supplier.
Water Shortage Pricing	All Mandatory Stages	As required by wholesale supplier.
Education Program	All Stages	Minimal impact.
Voluntary Rationing	Voluntary Stages	Up to 10% reduction.
Mandatory Rationing	All Mandatory Stages	As required by wholesale supplier.

Table 7-12. Penalties and Charges (DWR Table 28)

Examples of Penalties and Charges	Stage When Penalty Takes Effect
Water Conservation Program Violation – Citation	First Violation
Water Conservation Program Violation – Penalty of $100 placed on water bill	Second Violation
Water Conservation Program Violation – Penalty of $250 placed on water bill, and a restriction of service to 5 gallons per minute for 120 hours	Third Violation
Water Conservation Program Violation – Complaint filed with the County of San Diego District Attorney's office and flow restriction of 5 gallons per minute until disposition	Fourth Violation
Emergency Water Plan Violation – Citation	First Violation
Emergency Water Plan Violation – Penalty equal to 25% of previous month's water bill and service of water limited to not less than 5 gpm and not more than 10 gpm for a period not to exceed 72 hours.	Second Violation
Emergency Water Plan Violation – Penalty equal to 50% of the previous month's water bill and service of water terminated for a period not to exceed 48 hours.	Third Violation

7.3.8 Analysis of Revenue Impacts of Reduced Sales During Shortages

The Act also requires that an agency's urban water shortage contingency analysis include an analysis of the impacts of the various water shortage responses on the revenues and expenditures of the urban water supplier. Tables 7-13 and 7-14 list some impacts on revenues and expenditures that have been encountered in the past or are anticipated in the future.

Table 7-13. Actions and Conditions that Impact Revenues (DWR Table)

Type	Anticipated Revenue Reduction
Review of Rate Adjustment	No impact. This would be an administrative function to analyze rate structure options to offset potential losses in revenue associated with reduced sales.
Development of Reserves	No impact. The agency has existing operating, water rate and power rate stabilization reserves as well as reserves for capital improvements.
Change in Quantity of Sales	Approximately 80% of the revenue collected by the District is utilized to purchase water from MWD and the SDCWA and power for pumping from SDG&E. Consequently, a reduction in water deliveries will have effect a direct and commensurate reduction in those expenses. Of the $9.5 million needed to fund local operation and maintenance (O & M) costs in fiscal year (FY) 2005-2006, $5.2 million comes from non-commodity based sources, such as taxes, monthly meter service charges, investment and other revenue. Consequently, the associated reduction in commodity based revenues generated to cover local O & M costs would be offset by a combination of budget reductions, expense deferrals, including some non-critical CIP projects, draws on rate stabilization and operating reserves, and rate adjustments.
Impact on Customer's Bill	Initially, the only impact on the customer's bill would come if the customer exceeded the allowed usage levels and incurred penalty pricing. If the shortage extended beyond a one to two full years and all reasonable short-term spending adjustments had been exhausted and prudent draws on reserves had been made, rates would then have to be adjusted by the percentage necessary to offset short-term revenue deficits.
Distribution of Customer Impacts Between Customer Types	The agency has two customer classes, Firm M&I and MWD IAWP, or interruptible. Reductions to the IAWP customer class would be as per the MWD IAWP program, or an initial interruption of 30%, and then additional reductions based upon water supply condition. Reduction to the Firm M&I class would be determined by the wholesale suppliers to the agency, MWD and the SDCWA.
Impacts to Water Supplier of Higher Rates and Penalties	Given the very high percentage of cost being associated with variable wholesale water costs and power costs, the fact that over 50% of the revenue needed to supply local needs comes from non-commodity based sources, and the ability of the agency to defer various CIP expenditures if need be, the short-term (1 to 2 years) impact on the agency would be very manageable. If the water supply reduction were to become a long-term condition (beyond 3 years) adjustments would be made in the operational and staffing levels as well as in the rate structure.
Cost Recovery Reviews	In the short-term, cost recovery would not be a significant issue, as budget adjustments and draws on reserves established specifically for such purposes would have covered the short-term revenue reductions. If the conditions were long-term, more permanent adjustments in operational and staffing levels as well as the rate structure would have to reviewed and evaluated.

Table 7-14. Actions and Conditions that Impact Expenditures (DWR Table)

Category	Anticipated cost
Change in Quantity of Sales	Referring to the discussion for the same category in table 7-13, given the mix of costs associated with whole water and power purchases and fixed versus variable revenues for local costs, the actual short-term impact associated with the loss of sales is minimal. As an example, for the current FY 2005-2006, of the $32 million in commodity based water and power revenue, only $4.25, million, or 13% is directed to cover local O & M costs, so the reduction in total commodity based revenues is not a dollar for dollar reduction in revenues needed for local, non-variable expenses. For example, a 20% reduction in total commodity related revenues, or $6.4 million, would only result in a $840,000 loss in revenue for local O & M costs, which, in the short-term could be offset with budget adjustments, moderate CIP deferrals and draws on existing reserves. Again, in this example, if a rate increase were implemented, is would only require a 3% overall rate increase on the remaining 70% of normal sales to offset the revenue loss needed to fund local costs.
Cost Recovery Reviews	None – would be completed by current administrative and financial staff.
Increased Staff/Salaries/Overtime	None- existing staff would be re-assigned to perform functions required to implement and enforce mandatory use provisions and rate features needed to reduce consumption.
Increased Costs of New Supplies, Transfers or Exchanges	New supplies would be secured by wholesale suppliers and the cost would be melded into the overall whiles cost. It is anticipated that the wholes sale costs could be increased by as much 25% overall to secure additional supplies, which would be passed through to agency retail customers.

Revenue impacts specified in the Contingency Plan would be offset with a combination of the following:

1. An increase in water commodity and service charges
2. A reduction in annual operating expenses
3. Reserves currently earmarked for long range capital
4. General tax fund revenues currently earmarked for future capital improvements

It is anticipated that Option Number 4, the diverting of general tax and water availability/stand by revenues, would be the least disruptive. Methods to mitigate revenue/expenditure impacts are shown in Tables 7-15 and 7-16.

Table 7-15. Proposed Measures to Overcome Revenue Impacts (DWR Table 29)

Name of Measures	Summary of Effects
Reserve Fund	This option would have no impact on the rate payers or the agency as there are currently rate stabilization, operating and CIP reserves established, funded and available for use as intended.
Change Rate Structure	As demonstrated in table 7-13 and 7-14, given the mix of wholesale and power costs and commodity and non-commodity based revenues for local non-variable costs, changes in rates to offset significant reductions in available water supplies would be minimal.
Reduce Overhead	Overhead, or local fixed O & M costs, can be reduced in the short and mid-term by deferring selected cash-funded CIP and major maintenance projects, other expenditure reductions and if needed, hiring freezes.
Decrease Capital Expenditures	Most of the District's CIP is cash funded and is for replacement of existing infrastructure. Deferral of selected, non-critical replacement projects will have little or no impact on the agency or its customers, and would only extend out in time the master planned replacement schedule. Infrastructure for new development is funded by new development and progresses at the rate needed by new development projects.
Revise Planning Estimates	If supply reduction were long-term, the agency would make commensurate adjustments to its' CIP schedule, anticipated Corporate Facility requirements, staffing levels and retail rate structures based upon lower retail sales that currently anticipated. Impacts would be moderate and implemented over time.

Table 7-16. Proposed Measures to Overcome Expenditure Impacts (DWR Table 30)

Name of Measures	Summary of Effects
Reserve Fund	No impact- reserve funds exist and are funded for the very purposes anticipated in a supply shortage scenario.
Change Rate Structure	Given the mix of wholesale water and power expenditure, non-commodity revenues needed to cover local fixed costs, availability of reserves and the flexibility to adjust CIP expenditures, short –term (1 to 2 year) impacts would non-existent to legible, mid-term (3 years) moderate and long-term (beyond three year) moderate and incremental.
Reduce Overhead	In the short-term and mid-term, over-head, or local costs can be reduced by deferring non-critical CIP and major maintenance expenditures, and in the long-term by adjusting operational and staffing levels and retail water rate structures to incorporate the reality of lower retail water sales than previously anticipated.
Decrease Capital Expenditures	In the short-term, there could be a decrease in the level or, if need be, even a total interruption in the expenditures for the agency's facility replacement program. In the mid, to long term, adjustments would be to the retail rate structure and to the prioritization schedule to ensure that projects critical to service and system reliability were implemented
Revise Planning Estimates	If the reduced supply is determined to be a long-term condition, then commensurate adjustments would be incorporated into long-term staffing, corporate facility and water system facility expansion and facility requirements.

7.3.9 Reduction Measuring Mechanisms

Section 10632(i) of the Act states that an agency's urban water shortage contingency analysis shall include the following element: "A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis."

The mechanisms needed to determine actual water reductions operate on an ongoing basis. All water received from the SDCWA is metered and monitored. Additionally, all District customers are metered and billed monthly with computerized equipment. Each customer or customer group can be evaluated as to compliance with conservation requirements. Methods used by the District to determine actual reductions in water use are summarized in Table 7-17.

Table 7-17. Reduction Measuring Mechanisms (DWR Table 31)

Mechanism for Determining Actual Reduction	Type and Quality of Data Expected
Use Normalized or Average Water Use Baseline to Determine Reductions	Each customer will be given a schedule of monthly use targets based upon the required reduction compared to the base period usage. Usage over the amount allocated for any given month will result in the customer incurring penalty pricing for usage that month. Usage under that amount will be accumulated to possible offset over-usage in successive month period.
More Frequent Review of Production	Water production is currently monitored on a real-time basis through the district's SCADA system, and reviewed on a daily basis.
More Frequent Meter Reading at Customer Location	Customer meters are read on a monthly basis which would coincide with the monthly allocation periods. Customers are given information on how to read their meter and monitor their own usage, and in the last drought program (91'-92') customers did monitor their own usage so as to avoid penalty pricing. More frequent reading by the agency would not be practical or produce useful data.
More Frequent Leak Detection and Repair	Leak detection and repair is currently an active and ongoing O&M function, so no major changes would be expected.
More Frequent Meter Checking and Repair	Currently the agency's unaccounted for water factor ranges between 4% and 5% which is well within AWWA standards. However, methods to further reduce this factor through more frequent meter change-out and replacement are currently being evaluated and may be incorporated in the future agency budgets, irrespective of water supply conditions.
System Audit	The water system is currently audited in a monthly and the annual basis, comparing metered deliveries from the SDCWA to meters deliveries to retail customers. The agency is not aware of a methodology which would improve data collection in this area.
Automated Sensors and Telemetry	The agency currently has a full telemetry system and is converting that system over to SCADA, which does now and will contain features to provide real-time monitoring and alarms communication to on-call operators for abnormalities in reservoir fill rates, draw-down rates, and pump function, which can be associated system leaks and other malfunctions which could result in water loss.
Monitor Utility Actions	All utility actions are monitored and reported in a comprehensive District Activities Report provided to the agency Board of Directors on a monthly basis. Other types of staff reports on agency activities are given at the two regular Board Meeting each month or on as needed basis by the General Manager.
Penalties for Customers	If and when penalty pricing were to implemented, the amount and frequency of penalties would be monitored by the agency's computerized billing system and then reported to the management staff and on to the Board of Directors on a monthly basis.

As demonstrated in previous sections of this document, the operative provisions of the District's Contingency Plan (i.e., water shortage response, water use prohibitions, enforcement charges, and penalties for excessive usage) are currently in place as part of the Valley Center Municipal Water District's Administrative Code. Relevant Administrative Code articles are included as Appendix E of this Plan.

APPENDIX A

NOTICE OF PUBLIC HEARING AND PUBLISHED PUBLIC COMMENTS

APPENDIX B

ADOPTED RESOLUTION

APPENDIX C

VCMWD'S 2004 WATER QUALITY REPORT

APPENDIX D

2003-2004 BMP ACTIVITY REPORTS

APPENDIX E

VCMWD'S REGULATIONS AND CODES