California Water Service Company

2005 Urban Water Management Plan

Hermosa-Redondo District

FINAL

December 31, 2005

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Date plan submitted to the Department of Water Resources: **January 9, 2006**

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1 Introduction

California Water Service Company is an investor-owned public utility supplying water service to 1.7 million Californians through over 440,000 connections. Its 25 separate water systems serve over 50 communities from Chico in the north to the Palos Verdes Peninsula in Southern California. In 2000, Cal Water merged with the Dominguez Services Corporation incorporating several northern and southern California water systems. California Water Service Group, Cal Water's parent company, is also serving communities in Washington, New Mexico and Hawaii. Rates and operations for districts located in California are regulated by the California Public Utilities Commission (CPUC) and are set separately for each of the systems. Cal Water has been in continuous operation in California since 1926 and has provided water service to the Hermosa-Redondo community since 1926.

1.1 Purpose

California Water Code §10644(a) requires urban water suppliers to file with the Department of Water Resources, the California State Library, and any city or county within which the supplier provides water supplies, a copy of its Urban Water Management Plan, no later than 30 days after adoption. California Water Service Company will follow the California Water Code and file an Urban Water Management Plan at least once every five years on or before December 31, in years ending in five and zero.

The 2005 Urban Water Management Plans are due December 31, 2005. All urban water suppliers as defined in Section 10617 (including wholesalers), either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an Urban Water Management Plan.

This UWMP is a foundation document and source of information for a Water Supply Assessment and a Written Verification of Water Supply. An UWMP also serves as:

- A long-range planning document for water supply,
- Source data for development of a regional water plan, and
- A source document for cities and counties as they prepare their General Plans.
- A key component to Integrated Regional Water Management Plans.

1.2 Public Review

California Water Service Company completed a draft of the Urban Water Management Plan for Hermosa-Redondo district on August 8, 2005. The draft was sent to the Cities and County listed in Table 1.3-1 for review and comment. Copies of the draft plan were available at the California Water Service Company Corporate Office in San Jose and at the district office for public review and comment.

California Water Service Company conducted a formal public meeting to present information on its general rate case request to the CPUC. Presentation of the Urban Water Management Plan is included in the proceedings and serves as a public review of the Urban Water Management Plan. A public hearing was held on November 28, 2005 at the following location:

Redondo Beach City Hall Council Chambers
415 Diamond Street
Redondo Beach, CA 90277

At 2:00 p.m. and 7:00 p.m.
Room was reserved from 1:00 p.m. to 10:00 p.m.

Proof of the public hearing is presented in Appendix A

1.3 Plan Adoption

Final comments were received by December 14, 2005. The final plan was adopted by the Vice President of Engineering & Water Quality on December 31, 2005 and was submitted to California Department of Water Resources within 30 days of approval. Appendix A presents a copy of the signed Resolution of Plan Adoption.

Table 1.3-1 summarizes California Water Service Company's level of activity to include various agencies in the planning process of this Urban Water Management Plan

Table 1.3-1: Coordination with Appropriate Agencies (Table 1)

	Commented on the draft	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not Involved / No Information
City of Hermosa Beach		✓	✓	
City of Redondo Beach		✓	✓	
City of Torrance		✓	✓	
County of Los Angeles		✓	✓	
West Basin Municipal Water District		✓	✓	
District Manager	✓	✓	✓	

The agencies listed in Table 1.3-1 have also been sent a copy of the final version of this report.

In addition to the resolution, Appendix A also contains the following:

- Any comments received during the public review of this plan.
- Minutes from the public hearing.
- The review sheet check list from Department of Water Resources.

1.4 Water Management Tools

California Water Service Company uses the following water management tools to maximize water resources for the Hermosa-Redondo district.

- Hydraulic analysis will be used to identify limitations in the water distribution network and provide recommendations if main replacement is required.
- Geographical Information Systems (GIS) will be used to combine several sources of information and allow land usage management tools to provide insight into the growth of the district.
- Water quality data analysis provides a detailed compositional analysis of the water and provides information on potential supply shortfalls that can result from mineral intrusion or contamination.
- Water Supply and Facilities Master Plan provided details into the district from a global perspective and evaluates the major equipment and facilities replacement schedule, and identifies long term projects.

1.5 Plan Organization

This plan is organized as described in the following outline. The corresponding provisions of the California Urban Water Management Planning Act are included as references. Tables in this plan have cross references to the tables as listed in the "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan" prepared by the California Department of Water Resources.

Section	Executive Summary	Act Provision
Contact Sheet	List of Contact Persons	-
Chapter 1	Introduction This chapter describes the requirement and the purpose of the Urban Water Management Planning Act, plan adoption, schedule, and management tools.	§10620 (d, f) §10621(a-b) §10635(b) §10642 §10644 (a) §10645
Chapter 2	Service Area Information This chapter describes the district service area and includes area information, population estimate, and climate description.	§10631 (a)
Chapter 3	Water Sources This section includes a detail discussion of the water supply sources including a section on the water quality	§10631 (b-c) §10632 (b) §10633 §10634
Chapter 4	Water Shortage Contingency Plan This chapter describes the district's planning during water shortages during drought and emergency situations.	§10620 (d)(1)(2) §10631 (d, g) §10632
Chapter 5	Water Use Provisions This chapter describes the water supply projection methodology used estimate water demand and supply requirements to 2030 in five year increments.	§10631 (e) §10631 (k)
Chapter 6	Supply And Demand Comparison	§10631 (h-i)

Section	Executive Summary	Act Provision
	This discussed the water supply outlook for the district under different hydrologic conditions in accordance with DWR guidelines. Specifically, supply and demand comparisons in five year increments to 2030 under normal, dry year and multiple dry year conditions are presented in this section.	§10635 (a)
Chapter 7	Water Demand Management Demand management measures used to benchmark conservation methods is described in this chapter.	§10631 (g) §10631 (j)
References	References The source of any information used in this plan is listed in this section	-
Appendix A	Resolution To Adopt The Urban Water Management Plan This section includes the following: 1) Resolution 2) Letters to and comments from various agencies 3) Minutes from the public hearing 4) DWR Checklist	§10621
Appendix B	Service Area Map This appendix includes the service area map of the district as filed with the Public Utilities Commission	-
Appendix C	Water Supply, Demand, And Projection Worksheets This section includes spreadsheet used to estimate the water demand for the district.	-
Appendix D	California's Ground Water Bulletin 118 Sections from the Department of Water Resources Bulletin 118 is included as a reference and details the basin for the district	§10631 (b)(1-4)
Appendix E	Tariff Rule 14.1 Water Conservation And Rationing Plan This section contains the tariff rule for reference	§10632 (d)
Appendix F	Water Efficient Landscape Guidelines The guideline for water efficient landscape that California Water Service Company uses at its properties, including renovations, is contained in this section.	-
Appendix G	CUWCC Annual Reports This sections contains the reports filed with the California Urban Water Conservation Council	§10631 (j)
Appendix H	WBMWD Urban Water Management Plan A copy of the Urban Water Management Plan from West Basin Municipal Water District is attached for reference.	§10631 (b)(1-4)
Appendix I	BMP Economic Analysis Assumptions Worksheets for each BMP are presented in this section.	-
Appendix J	Purchase Agreement with West Basin Municipal Water District A copy of the Purchase Agreement with West Basin Municipal Water District is attached for reference.	-
Appendix K	Adjudication Order The adjudication order for the West Coast Basin is attached for reference.	§10631 (b)(1-4)

1.6 Implementation of Previous UWMP

California Water Service Company has 25 separate water service districts and maintains separate plans for each district. The plans have been divided into 3 groups, which each group being updated on a 3-year cycle, as approved by the Public Utilities Commission. The last Urban Water Management Plan for Hermosa-Redondo District was published in 2002 as part of the general rate case.

New BMP programs have not been proposed in the 2001 UWMP. The status of the BMP programs as of 2004 is listed in Table 1.6-1.

Table 1.6-1: Proposed 2001 Conservation Programs

Program	Program Implemented
BMP 01 Residential Survey	On-going
BMP 02 Plumbing Retrofit	On-going
BMP 07 Public Education	On-going
BMP 08 School Education	On-going
BMP 14 ULFT Rebate	On-going

2 Service Area Information

2.1 District Description

The Hermosa-Redondo District is located at the southwest corner of the Los Angeles coastal plain, approximately 15 miles from downtown Los Angeles. The general location of the Hermosa-Redondo District is shown in the Figure 2.1-1. Its service area, built on coastal dunes facing the Santa Monica Bay, encompasses the cities of Hermosa Beach and Redondo Beach and approximately 5% of Torrance. The system is bounded on the north by the cities of Manhattan Beach and Lawndale, on the east by Gardena and Torrance, on the south by Palos Verdes Estates, and on the west by the Pacific Ocean.

The City of Manhattan Beach provides retail water service to that community; Southern California Water Company serves Gardena; and both Cal Water's Rancho Dominguez District and the City of Torrance Water Department serve Torrance. Cal Water's Palos Verdes District provides retail water service to Palos Verdes Estates.

Major transportation links in the district include the San Diego Freeway (Interstate 405); the Pacific Coast Highway; Torrance, Hawthorne, Manhattan Beach, Aviation, Artesia and Sepulveda Boulevards; and Prospect Avenue. The Los Angeles International Airport (LAX) is about seven miles north of the heart of the district. King Harbor serves the recreational and sport fishing boats in these communities.

Major geological features of the region include the Palos Verdes Fault Zone, which, along with the Cabrillo Fault, is responsible for the uplift of base rock that forms the Palos Verdes Peninsula adjacent to and south of Hermosa-Redondo, Figure 2.1-2. The Newport-Inglewood Fault, which has been identified as one of the most dangerous faults in the Los Angeles area, lies five miles east of the district. Major earthquakes on any of these faults may disrupt water service.

Figure 2.1-1: General Location of Hermosa-Redondo District

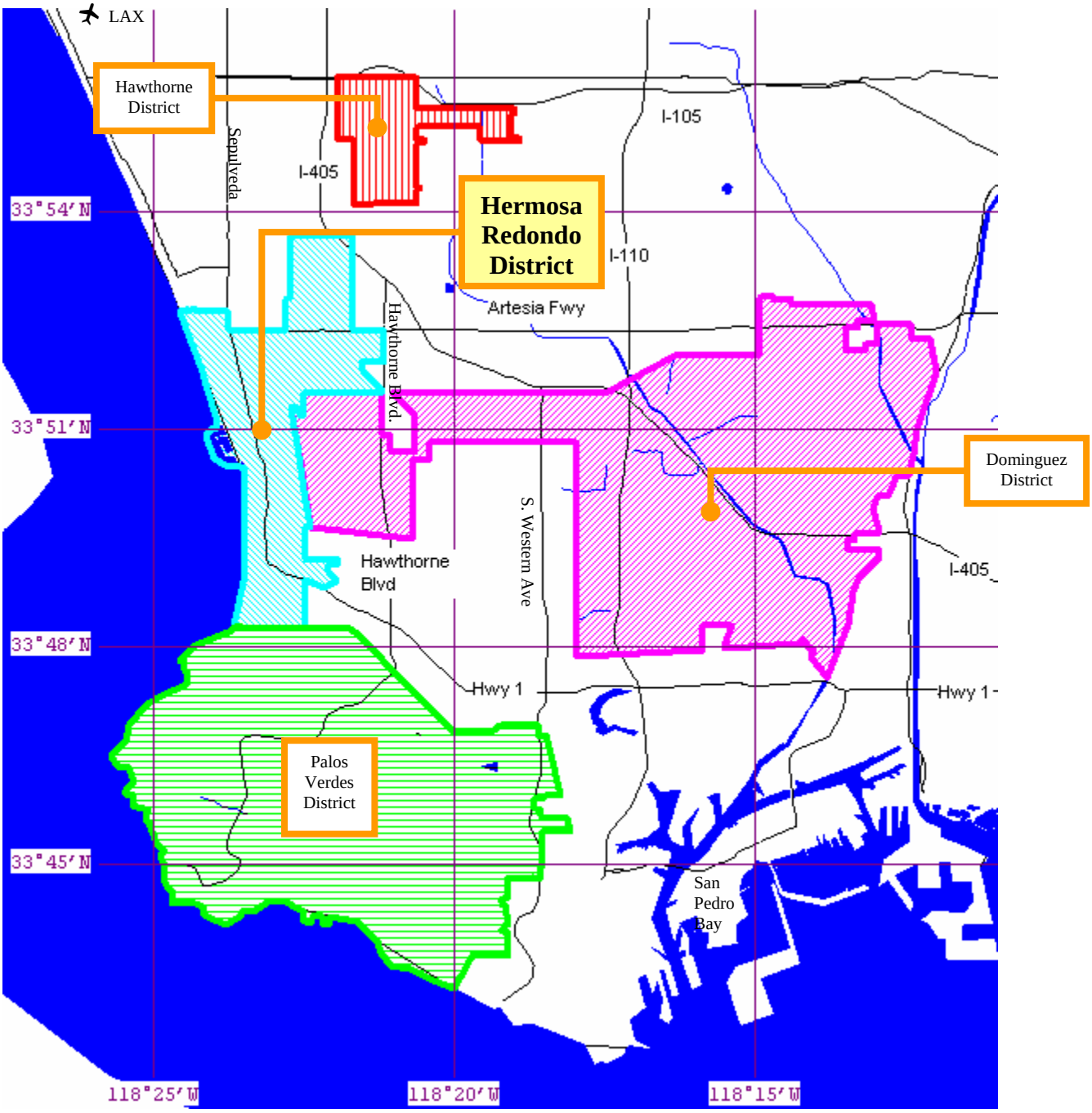
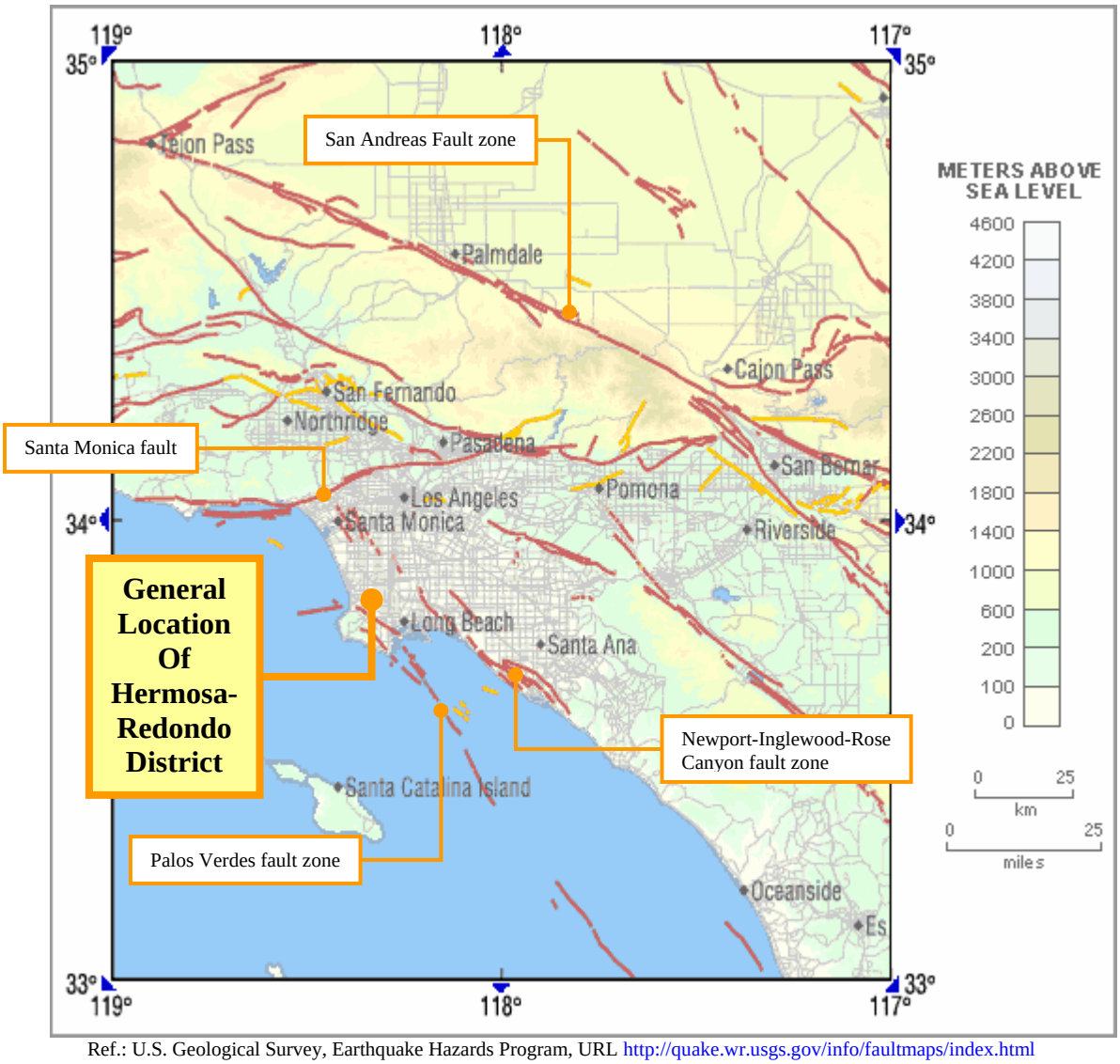


Figure 2.1-2: Active Fault Lines



Ref.: U.S. Geological Survey, Earthquake Hazards Program, URL http://quake.wr.usgs.gov/info/faultmaps/index.html

2.2 Service Area Population

Estimate of the population serviced by California Water Service Company is based on overlaying the 2000 U.S. Census Tract Block data with the service area map (SAM), as shown in Figure 2.2-1. A summary of the census data for the Year 2000 is shown in Table 2.2-1. LandView 5 and MARPLOT ® software were used to generate the data (ref. 8)

Figure 2.2-1: Approximated SAM with US Census 2000 Tract Map

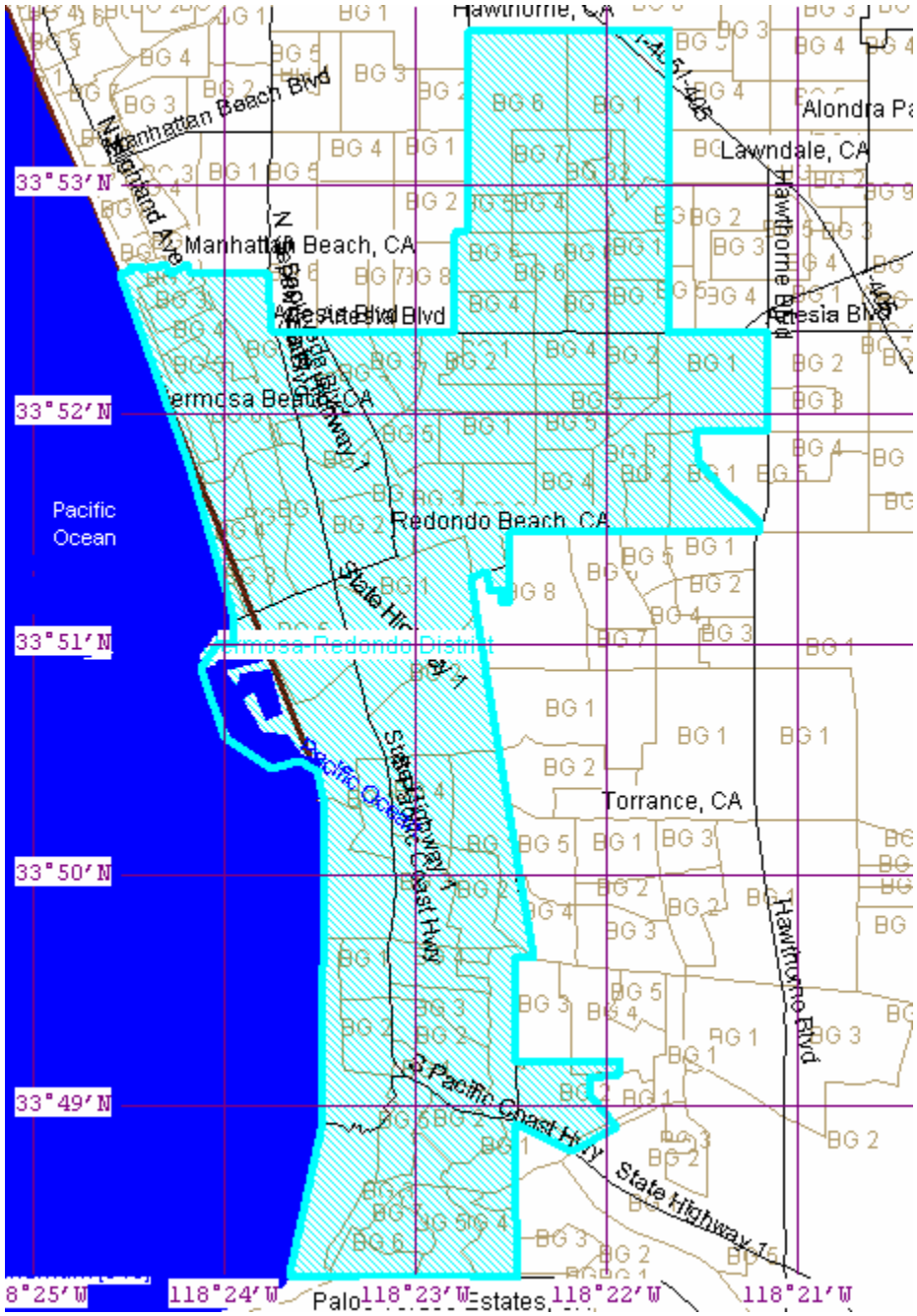


Table 2.2-1: Summary of Census 2000 Data			
	Census Tract Blocks	**Population**	**Housing Units**
Hermosa-Redondo Service Area	1,003	89,637	43,084

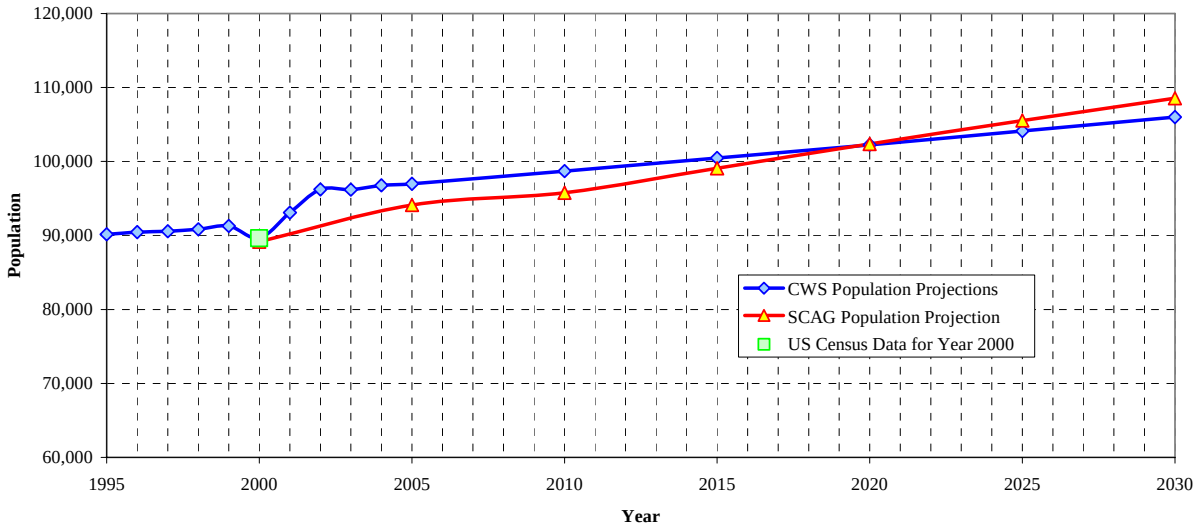
The service count for the district was 35,760 for single family and multifamily residences in Year 2000. Using the ratio of given population and the service count yield a population density of 2.507 persons per residential service (single family residential services and multifamily units).

Based on the 2000 census and district service connection growth, California Water Service Company estimates the population in the Hermosa-Redondo District is approximately 96,800 at the end of year 2004. Table 2.3-2 presents the current and projected population growth for the Hermosa-Redondo District in five year increments. The population projections based on district service counts and Southern California Association of Governments (SCAG) Census Data (Ref. 1) are presented in Figure 2.2-2

Table 2.2-2: Population - Current and Projected (Table 2)

	2005	2010	2015	2020	2025	2030
Service Area Population	97,000	98,710	100,470	102,270	104,110	106,000

Figure 2.2-2: Estimated Population Comparison



The population projections using the SCAG data assumed the following percentages for each city:

- 100% of Hermosa Beach city
- 100% of Redondo Beach city
- 5% of Torrance city

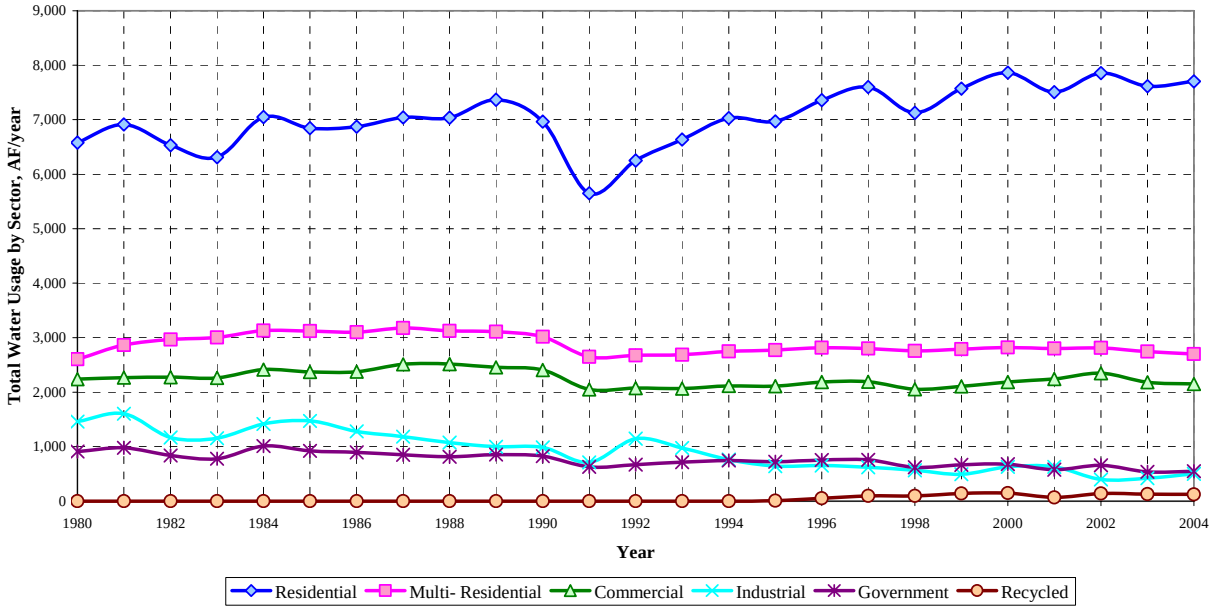
From the graph above, it is shown that the growth rate projected by California Water Service Company is similar to that the projected rate of increase for the data source from SCAG agency.

2.2.1 Other Demographic Factors

The demographic makeup of the district is mainly residential as shown in Figure 2.2-3. This sector has remained at a fairly constant growth since 1980. The multiresidential and commercial sectors have remained constant since 1980. Industrial and governmental services have been at a constant decline and make a small percentage of the district users. Recycled water users are the smallest percentage of the district and have only been established in 1997.

Individual growth rates for each sector were used to project the future demand unless the individual growth rate was determined to be erroneous, then the overall growth rate was used. Additional discussion is provided in Section 5.

Figure 2.2-3: Water Usage by Sector



2.3 Climate

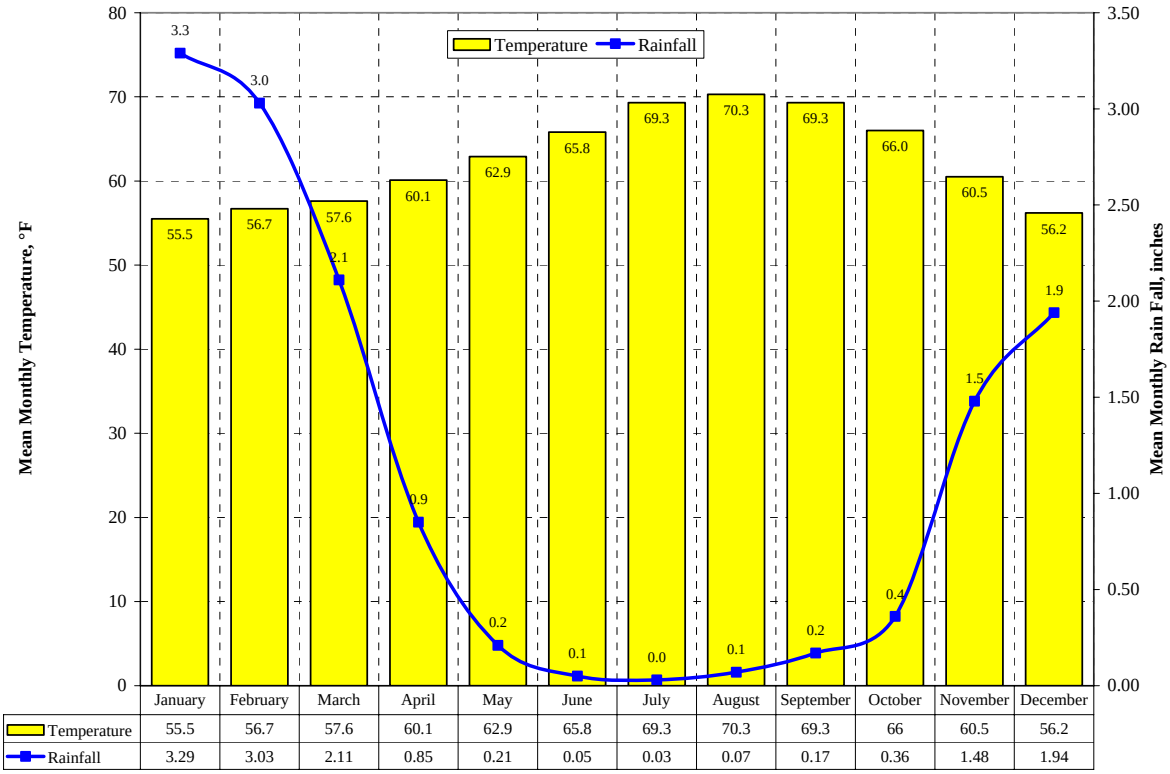
Hermosa-Redondo District enjoys a Mediterranean climate with warm dry summers and wet cool winters.

The following table, Table 2.3-1, lists the average annual conditions for the closest weather station to the Hermosa-Redondo District. The average rainfall for the district is 35% of the annual total evapo-transpiration value.

Table 2.3-1: Average Annual Climate (Table 3)		
Average Temperature	**Average Rainfall**	**Annual Total Evapo-transpiration**
62.5°F	13.6 inches	39.01 inches/month

Figure 2.3-1 displays the average monthly temperature and rainfall (Ref. 2).

Figure 2.3-1: Average Monthly Temperature and Rainfall (Table 3)

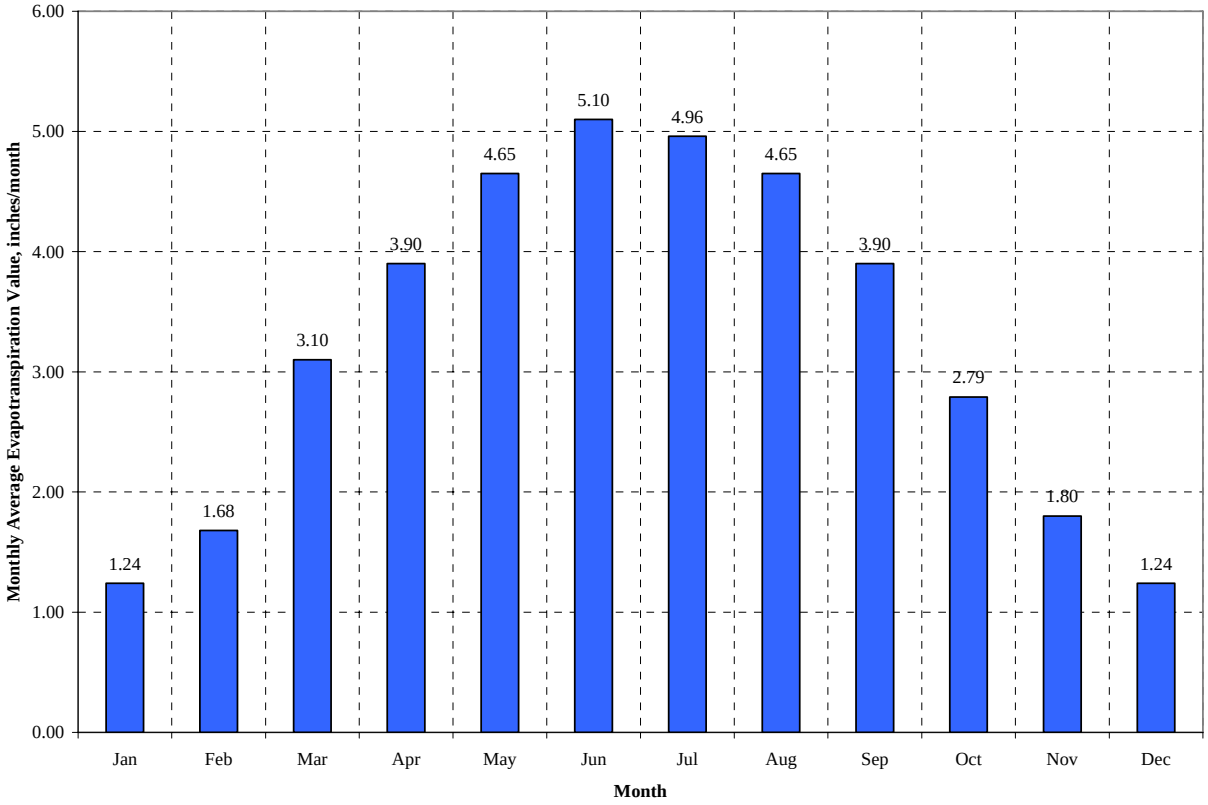


	January	February	March	April	May	June	July	August	September	October	November	December
Temperature	55.5	56.7	57.6	60.1	62.9	65.8	69.3	70.3	69.3	66	60.5	56.2
Rainfall	3.29	3.03	2.11	0.85	0.21	0.05	0.03	0.07	0.17	0.36	1.48	1.94

Figure 2.3-2 displays the monthly average evapotranspiration values for the area of the district (Ref. 3). Evapotranspiration values estimate the amount of water loss by the combination of two separate processes: evaporation from soil surface and transpiration by plants.

Additional climate data is provided in the Appendix C, worksheet 18.

Figure 2.3-2: Monthly Average ETo Values (Table 3)



3 Water Sources

The Hermosa-Redondo District uses both groundwater and imported surface water supplies. Groundwater extracted from the West Coast Basin's Silverado aquifer satisfies 10 to 15% of the district's water demand. Three wells located in the northeast corner of the service area have a current capacity of 2,650 gpm, which is equivalent to 3.8 mgd.

Purchased water from West Basin Municipal Water District (WBMWD), one of twenty-seven member agencies of Metropolitan Water District of Southern California (MWDSC), satisfies 85 to 90% of the district's water demand. WBMWD serves as the regional wholesaler and developer of local supplies. The projected water supply source and volume based on average consumption is summarized in Table 3-1.

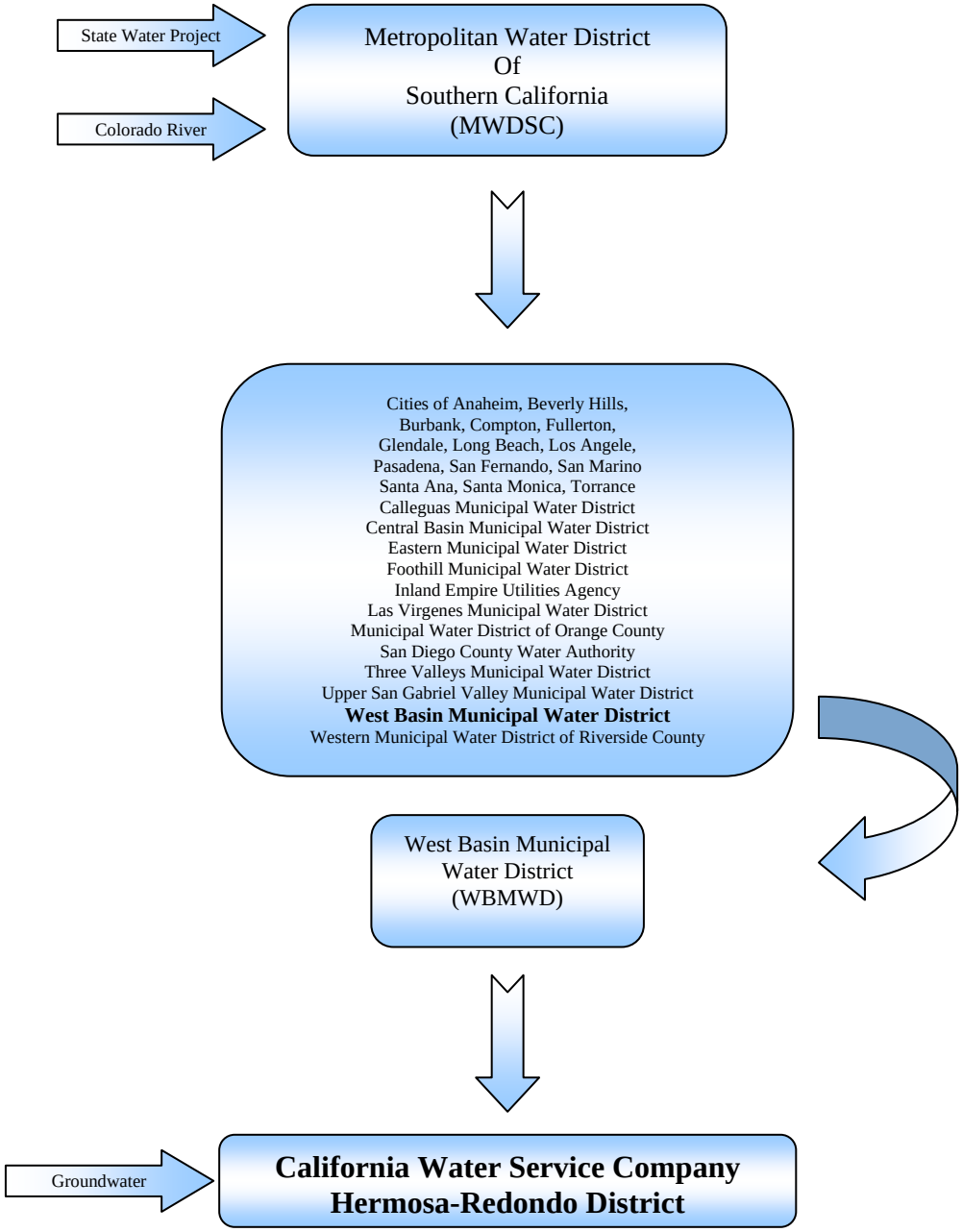
Table 3-1: Planned Water Supplies (Table 4)
(AFY)

Water Supply Sources	2005	2010	2015	2020	2025	2030
West Basin Municipal Water District	13,027	13,206	12,923	12,845	13,384	13,957
Supplier produced groundwater	2,500	2,750	3,500	4,070	4,070	4,070
Supplier surface diversions	-	-	-	-	-	-
Transfers in or out	-	-	-	-	-	-
Exchanges In or out	-	-	-	-	-	-
Recycled Water (projected use)	146	146	147	147	147	147
Desalination	-	-	-	-	-	-
Total	**15,673**	**16,102**	**16,570**	**17,062**	**17,601**	**18,174**

3.1 Imported Water

Imported water is delivered through four WBMWD service connections from two MWDSC distribution feeders: the West Basin Feeder and the Palos Verdes Feeder. Because the four connections are located on these feeders, the district is completely reliant on these two MWDSC feeders. Two other MWDSC feeders, the West Coast Feeder and the Sepulveda Feeder, also serve the region, and could be used as additional connection to improve system reliability. The total rated capacity of the four service connections is 26,930 gpm (38.8 mgd).

Figure 3.1-1: Water Source for Hermosa-Redondo District



MWD water classifications of service and rate structure have gone under considerable change in recent years and further change is anticipated in the not too distant future. Key to the changes is the establishment of Purchase Agreements for Imported Water Provided WBMWD. These agreements, that become effective January 1, 2003, have a term of five years and establish several important new concepts with respect to water sales within Metropolitan Water District's service area, see Appendix J. The agreement sets a Base Allocation for each Purchaser, which is essentially their share of the supply Metropolitan Water District has made available to the WBMWD. The Base Allocation is based on that Purchaser's five year average non-surplus purchased during fiscal years ending 1997 through 2001. Over the term of the agreement, the Purchaser commits to purchase at least the amount of 60% of the Base Allocation times five, which is known as the Purchase Commitment. If a Purchaser does not purchase during the term of the agreement, the full Purchase Commitment, then they must pay for the balance at the average Tier 1 Supply Rate, initially set at $73 per acre-foot.

A two-tier rate and annual allocation is another aspect of these agreements. The agreement sets a Tier 1 Annual Maximum at 90% of the Base Allocation. All water purchased in any year in an amount that is equal to or less than the Tier 1 Maximum will be purchased at the Tier 1 Rate, initially set at $510 per acre-foot. Any amount of water purchase in excess of the Tier 1 Annual Maximum will be sold at the Tier 2 Rate, initially set at $591 per acre-foot.

In the Imported Water Purchase agreement for California Water Service Company with the WBMWD, the Base, Tier Allocations and Purchase Commitment are established as a combined allocation of all four Cal Water Districts. Under this, the Hermosa-Redondo District shares in the combined allocations with the three other California Water Service districts. The agreement was initially adopted to be effective on January 1, 2003; a later amendment became effective January 1, 2004. The amended agreement adjusted Cal Water's Base Allocation to 71,790 acre-feet, the Tier 1 Annual Maximum is 64,611 acre-feet and the Purchase Commitment is 212,466 acre-feet. Cal Water has developed an allocation that distributes the Tier 1 Annual Maximum to each of its four districts, so that if the total Tier 1 Maximum is exceeded the applicable Tier 2 charges can be assessed to the appropriate district. The allocations are as follows: Dominguez 20,675 AF, Hawthorne 4,523 AF, Hermosa-Redondo 15,507 AF, and Palos Verdes 23,906 AF.

In both 2003 and 2004 Cal Water's total water purchases from WBMWD exceeded the Tier 1 Annual Maximum in place in each of the years. However, Cal Water was granted an exemption from Tier 2 charges in both of these years because it was shown that the excess use was a result of the temporary inactivation of several wells in the Dominguez District due to water quality conditions, and the conditions within the Hawthorne Treatment Plant that prevent full production of Hawthorne's adjudicated water rights.

Based on the average demand conditions of Scenario 2 Demand Projections the current estimate for 2005 is that Hermosa-Redondo will need 13,027 acre-feet of imported water from WBMWD, which will be accounted for under this Tier 1 annual maximum allocation. The Dominguez, Hawthorne and Palos Verdes Districts have a combined

imported water demand of 54,247 AF; therefore, the total estimated Cal Water imported demand for 2005 is 67,274 AF, which is greater than the Tier 1 Annual Maximum amount of 64,611 AF. Cal Water is discussing an arrangement with other purveyors that purchase water from WBMWD to obtain access to a portion of their surplus Tier 1 Annual Maximum in order to avoid Tier 2 charges in 2005. To eliminate future Tier 1 excess usage Cal Water is implementing wellhead treatment on the effected wells in the Dominguez District, and studying methods to increase groundwater production in Hawthorne and Hermosa-Redondo.

In-Lieu Seasonal Storage currently remains a valid economic incentive program, but purchases of this class of water do not count toward the Purchase Commitment. Shift Seasonal Storage and Emergency service classifications were eliminated. Seasonal Storage Service is a classification for water that is available for delivery during the winter (October through April) in years of adequate supply. Monthly certification is required to receive this reduced-price Seasonal Storage Service.

To qualify for In-Lieu Seasonal Storage Service water rates, a purveyor must reduce the demand for supplemental water from MWD in the summer months (May to September) and shift production of groundwater from winter to summer. The baseline production ratio between local groundwater supply and total demand verifies that this shift has been accomplished. Under the In-Lieu classification the groundwater not pumped is left in the ground in order to augment groundwater replenishment efforts. This retirement results in a rebate or compensation for this action by the Water Replenishment District.

This program benefits MWD by reducing the summer peak flows that were beginning to tax MWD's treatment facilities and distribution system, and enables MWD to maximize water importation during the winter when surplus flows are abundant in the areas of origin. Changes are anticipated in this conjunctive use program in the next year. Preliminary conceptual changes do not appear favorable to California Water Service Co. Cal Water's participation in this conjunctive use program will depend on the makeup of the economic incentives provided by these changes.

3.2 Surface Water

California Water Service Company does not have any surface water within the Hermosa-Redondo District. Surface water is the source for the imported water, which is transported through the Colorado River Aqueduct system and from Northern California.

3.3 Groundwater

The Hermosa-Redondo District groundwater wells supply 10 to 15% of the district's water source. The district is situated on the following basin:

- South Coast Hydrologic Region
- Coastal Plain of Los Angeles Basin
- West Coast Sub-basin
- Groundwater Basin Number: 4-11.03

The West Coast Basin is an adjudicated groundwater basin with water rights to extract 64,468 acre-feet of groundwater annually and carry-over rights of up to 20%. Because the carry-over amount fluctuates, annual allowable extractions vary. The judgment provides for an exchange pool and the leasing or transfer of adjudicated rights between parties of the judgment. The adjudication order is attached in Appendix K.

The Department of Water Resources of the State of California (DWR) is the designated Watermaster for the West Coast Basin Adjudication. In that capacity, DWR accounts for all groundwater production in the basin, and annually reports on groundwater production and related groundwater-use transactions. The West Coast Basin was adjudicated in 1961 (Ref. 4).

The Hermosa-Redondo District exercises an annual adjudicated right of 4,070 AF, Table 3.3-1. This right is comprised of 3,071 AF issued to the district as part of the adjudication and 999 AF acquired when California Water Service Company purchased Palos Verdes District from the Palos Verdes Water Company. The Company is active in leasing its unused annual water rights.

Table 3.3-1: Groundwater Pumping Rights (Table 5)
AF Year

Basin Name	Pumping Right - AFY
West Coast Basin	4,070
Total	4,070

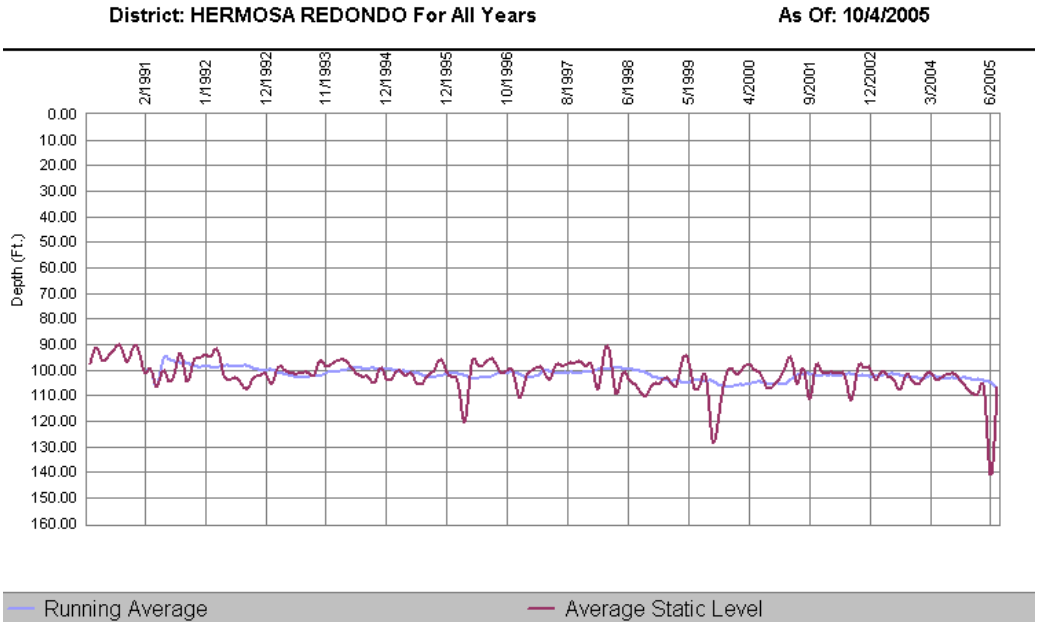
District wells can produce 2,650 gpm or 3.8 mgd. If operated non-stop daily, this pumping capacity could produce 4,250 AF per year, slightly greater than the annual adjudicated right. The Company has lost production capacity due to the saline contamination of local groundwater. The Company is working to replace this lost capacity. A listing of the district active wells, the design capacity, and the well depth is provided in Table 3.3-2.

Table 3.3-2: Active Wells for District

Well Number	Design Capacity (GPM)	Well Depth (feet)
8-02	850	350
22-01	900	600
30-01	900	435
Total	**2,650**	-

Figure 3.3-1 shows the average groundwater level for the District has remained within 90-110 feet since 1990.

Figure 3.3-1: District Average Well Level



The historical volume of the groundwater pump is shown in Table 3.3-3 and the projected volume is presented in Table 3.3-4.

Table 3.3-3: Amount of Groundwater pumped (Table 6)
AFY

Basin Name (s)	2000	2001	2002	2003	2004
West Coast Basin	2,206	1,916	1,441	2,997	2,280
% of Total Water Supply	14.3%	12.8%	9.4%	20.3%	15.4%

Table 3.3-4: Amount of Groundwater projected to be pumped (Table 7)
AFY

Basin Name(s)	2010	2015	2020	2025	2030
West Coast Basin	2,750	3,500	4,070	4,070	4,070
% of Total Water Supply	17.1%	21.1%	23.9%	23.1%	22.4%

As the district participated in the In-Lieu Replenishment Program, Hermosa-Redondo has not produced its full adjudicated rights in any year during the past twenty-three years. All water not produced by the district is stored in groundwater aquifers replenishing the basin. The Water Replenishment District of Southern California (WRDSC) pays In-Lieu rebates to Cal Water for its participation.

The Department of Water Resources' Annual Summary of Watermaster Service reports on groundwater status in the basin. This summary includes figures depicting lines of equal water level elevation in the fall and spring of each year, lines of equal change in water level, and charts showing historical fluctuation of water level elevation in wells throughout the basin. These references clearly indicate that, since the reduction in pumping began in 1954 and the adjudication was implemented in 1961, groundwater

levels in the West Coast Basin have risen approximately twenty feet. However, most groundwater elevations in the basin remain below sea level, requiring the maintenance of seawater intrusion barriers.

Seawater intrusion has been a problem in the West Coast Basin since the 1930's. Two seawater intrusion barriers, the West Coast Basin Barrier and the Dominguez Gap Barrier, have addressed the threat of losing the basin to salt water. The Los Angeles County Department of Public Works operates both barriers and the Water Replenishment District buys the water used in these facilities from WBMWD. The West Coast Basin Barrier, comprised of 149 injection wells situated approximately parallel with the Santa Monica Bay coastline, has a greater impact on the operations of the Hermosa-Redondo District than does the Dominguez Gap Barrier, a much smaller facility, providing protection along the San Pedro Bay in the southern portion of the basin.

The West Coast Basin Barrier has effectively halted the intrusion of seawater along the coastline adjacent to the district; however, the timing and location of the installation allowed a plume of saline water to become entrapped inland of the barrier. This plume has been responsible for the closure of at least six wells in the Hermosa-Redondo District.

The plume has continued to migrate inland, driven by groundwater elevations that are at or above sea level. Such elevations are intensified by water injections designed to prevent further intrusion and a pumping depression resulting from heavy groundwater production by oil refineries in the Wilmington area. Estimates indicate that this plume contains 300,000 AF of brackish water making it difficult to site new groundwater wells.

Dominguez Water Corporation, with the support of the West Basin Municipal Water District, the Water Replenishment District of Southern California, Metropolitan Water District of Southern California and the United States Bureau of Reclamation, established a seawater desalinization demonstration project in July of 1993. Their goal has demonstrated that this plume can be extracted, treated, and put to beneficial use in an economical manner. Cost data on the project indicates that the average monthly expenditure per acre-foot of potable water produced is $660. That cost is further reduced through an incentive program offered by MWDSC so that the unit cost to the customer is slightly less than non-interruptible imported service from MWDSC.

WRDSC is a public agency responsible for eliminating annual overdraft, reducing historical overdraft in both the West Coast and Central Basins, and protecting these basins from seawater intrusion or other contamination. Additionally, the WRDSC manages various groundwater quality cleanup programs. To finance its designated responsibilities the WRDSC levies a Replenishment Assessment on every acre-foot of groundwater produced in the Central and West Coast Basins.

The Los Angeles County Department of Public Works owns and operates all groundwater recharge facilities as a county funded activity through a longstanding inter-agency agreement. As a result, the costs associated with the capture and recharge of storm runoff

water is not directly accountable in the cost of water replenishment. All other water used for replenishing the groundwater of the Central and West Coast Basins is funded by the WRDSC through the Replenishment Assessment.

The principle mechanisms for recharge in the West Coast Basin are the injection of water into the seawater intrusion barriers, in-lieu replenishment, and inflow to the West Coast Basin from the Central Basin. The Central Basin is recharged through percolation of water applied to surface spreading ponds in the Montebello Forebay.

3.3.1 Basin Boundaries and Hydrology

The West Coast Subbasin is bounded on the north by the Ballona Escarpment, an abandoned erosional channel from the Los Angeles River. On the east it is bounded by the Newport-Inglewood fault zone and on the south and west by the Pacific Ocean and consolidated rocks of the Palos Verdes Hills. The surface of the sub-basin is crossed in the south by the Los Angeles River through the Dominguez Gap, and the San Gabriel River through the Alamitos Gap, both of which then flow into San Pedro Bay (Ref. 5 and 6).

A detail description of the basin is given in the California's Ground Water Bulletin 118, see Appendix D.

3.4 Recycled Water

The Hermosa and Redondo Beach service area currently receives recycled water from the West Basin Municipal Water District (WBMWD). WBMWD acquires, controls, distributes, and sells recycled water to several cities and agencies in the greater Los Angeles area.

The WBMWD has constructed what will ultimately be one of the largest water reuse projects in the United States. In the Phase I User Report, HYA Consulting Engineers identified over 105 economically feasible recycled water users with a combined estimated average annual demand of 19,100 AF. The project, when fully constructed, has the potential to deliver nearly 70,000 AF of tertiary treated recycled water per year. Following treatment at the Hyperion Water Treatment Plant owned by the city of Los Angeles and located near the Los Angeles airport, recycled water will be used for injection at the seawater intrusion barriers, for industrial operations and for landscape irrigation.

3.4.1 Wastewater Collection

The Los Angeles County Sanitation District (LACSD) own, operate, and maintain the sewer system consisting of gravity sewers, pumping stations, and force mains to collect wastewater in the Hermosa and Redondo Beach service area. The collected wastewater is discharged to trunk sewers and interceptors owned and operated by the LACSD. The wastewater is conveyed to the LACSD’s Joint Water Pollution Control Plant in Carson.

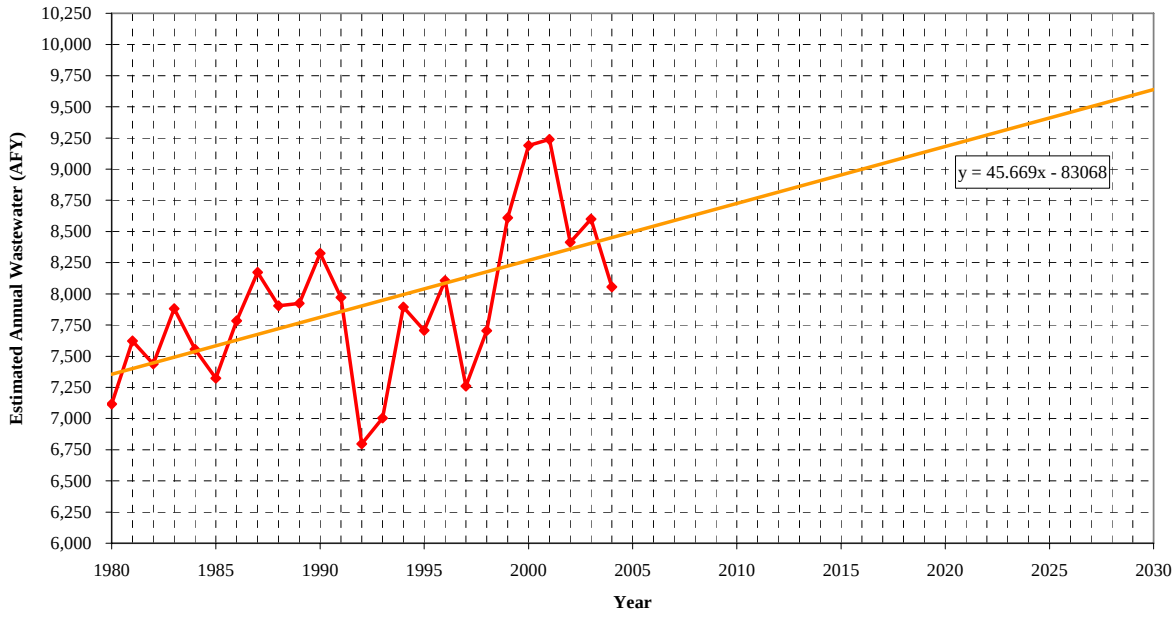
3.4.2 Estimated Wastewater Generated

Municipal wastewater is generated in the Hermosa-Redondo service area by a combination of residential, commercial, and industrial sources. The quantity of wastewater generated is proportional to the population and the water use in the service area. Assuming all indoor water use results in wastewater generation, projected wastewater flows were calculated using the percentage of indoor residential water use and Cal Water's water demand projections. Estimates of the wastewater flows for the future conditions are presented in Table 3.4-1. The estimates were obtained by annualizing 90 percent of residential January water use in the Cal Water's service area. The historical data from 1980 to the present is shown in Figure 3.4-1 with a linear projected of the data shown to the year 2030.

Table 3.4-1: Disposal of Wastewater (non-recycled) AF Year (Table 34)

Method of disposal	Treatment Level	2005	2010	2015	2020	2025	2030
Ocean outfall	Secondary treatment using the activated sludge process	8,498	8,726	8,954	9,183	9,411	9,639
	Total	8,498	8,726	8,954	9,183	9,411	9,639

Figure 3.4-1: Estimated District Annual Wastewater Generated



3.4.3 Wastewater Treatment and Recycling

Although the LACSD's Joint Water Pollution Control Plant provides the wastewater service for the Hermosa and Redondo Beach service area, recycled water is provided to the Hermosa and Redondo Beach service area by the West Basin Water Recycling Facility (WBWRF). The source of the recycled water is treated effluent from the city of Los Angeles' Hyperion Wastewater Treatment Plant. The Hyperion Wastewater Treatment Plant provides secondary treatment using the activated sludge process. Most

of the treated effluent is disposed of through an ocean outfall, but approximately 6 percent of the treated effluent is sent to the West Basin Water Recycling Facility in El Segundo where it undergoes chemical clarification, recarbonation, microfiltration, and chlorination. The WBWRF produces about 37.5 mgd of recycled water and has an ultimate capacity of 60 mgd.

Recycled water from the WBWRF is used for several purposes: 1) groundwater replenishment through more than 100 wells, 2) landscape irrigation and 3) industrial process water. The WBWRF serves more than 140 sites including areas in Manhattan Beach, Torrance, Hermosa Beach, and Inglewood. The biggest customers are the Chevron and Mobil oil refineries. In Cal Water's Hermosa and Redondo Beach service area, the recycled water customers include parks, one school, and businesses.

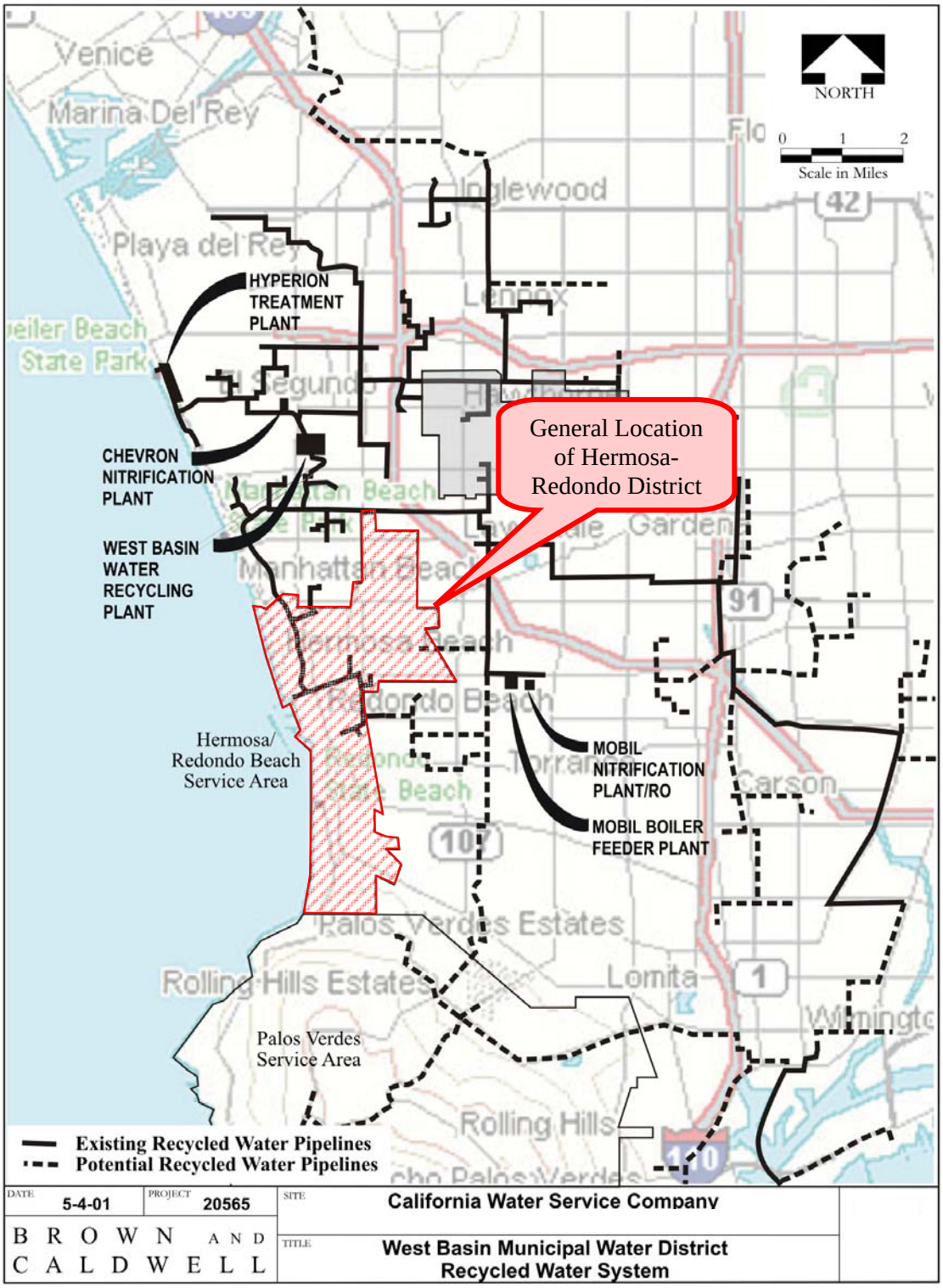
The Joint Water Pollution Control Plant is the largest of the LACSD's wastewater treatment plants. It provides advanced primary and partial secondary treatment for 350 million gallons of wastewater per day and serves a population of approximately 3.5 million people. The treated wastewater is disinfected with chlorine and sent to the Pacific Ocean through a network of outfalls that extends two miles off the Palos Verdes Peninsula to a depth of 200 feet. The plant was scheduled for total secondary treatment in the year 2002, and was considered for further treatment for use as a source for recycled water.

Recycled water use in the Hermosa and Redondo Beach service area is summarized in Table 3.4-2. The main features of the piping system for distributing the recycled wastewater in Cal Water's Hermosa and Redondo Beach service area are shown on Figure 3.4-2 (Ref. 7).

Table 3.4-2: District Recycled Water Use

Year	Purchased, acre-ft/year
1995	10
1996	57
1997	96
1998	103
1999	140
2000	147
2001	123
2002	137
2003	101
2004	112

Figure 3.4-2: Recycled Water System



3.4.4 Potential Water Recycling

The 2000 WBMWD Water Recycling Program (Kennedy/Jenks Consultants, 2000) identified potential customers in Cal Water's Hermosa and Redondo Beach service area. Commercial and industrial customers are currently utilizing recycled water and are projected to remain steady for the future. The total average demand projected for Hermosa and Redondo customers is 147 acre-feet per year. Table 3.4-3 summarizes the projected recycled water supply in California Water Service Company's Hermosa and Redondo Beach service area through the year 2030.

Table 3.4-3: Projected Recycled Water Supply for Hermosa-Redondo (Table 35) (AFY)

User type	Treatment Level	2005	2010	2015	2020	2025	2030
Agriculture	Chemical clarification, recarbonation, micro filtration, and chlorination.	-	-	-	-	-	-
Landscape		-	-	-	-	-	-
Wildlife Habitat		-	-	-	-	-	-
Wetlands		-	-	-	-	-	-
Industrial/Commercial		146	146	147	147	147	147
Groundwater Recharge		-	-	-	-	-	-
Total		146	146	147	147	147	147

WBMWD is responsible for:

- Determining the technical and economic feasibility of supplying recycled water to the district
- Encouraging the use of and optimizing the use of recycled water in the district
- Extension of recycled water lines within the district

California Water Service Company encourages the use of recycled water by offering the recycled water at a reduced cost.

3.4.5 Past Recycled Water Projection

The previous Urban Water Management Plan published in 2001 stated that in 2005, the amount of recycled water used would be 848 AF/yr. This value was based on WBMWD Water Recycling Program Master Plan which overestimated the amount of recycled water. Based in the usage in Table 3.4-2, current projections are shown above in Table 3.4-3.

3.5 Water Supply Reliability

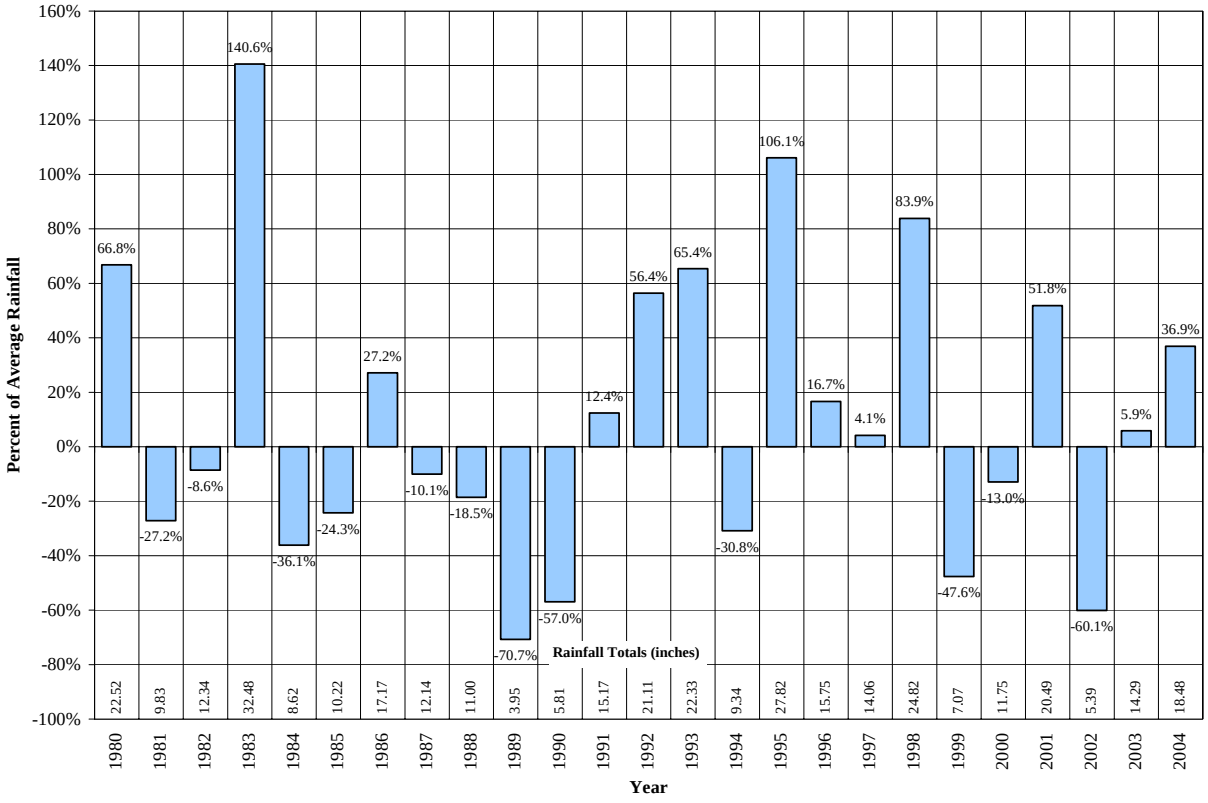
California Water Service Company's water supply for the Hermosa-Redondo district is reliable during low rainfall periods. Percentage of rainfall since 1980 is shown in Figure 3.5-1 with the average annual rainfall for the district of 13.6 inches. The most recent driest year occurred in 1989 when the rainfall was 71% below average (3.95 inches). This is taken as the Single Dry Year shown in the following table. The three Multiple Dry-

Water Years used in the following table are based on the most recent and consecutive lowest annual rainfall totals which occurred in 1988, 1989, and 1990. The Normal Year is taken as 1997, when the annual rainfall was approximately equal to the average rainfall totals. The base years are summarized in Table 3.5-1.

Table 3.5-1: Basis of Water Year Data (Table 9)

Water Year Type	Base Year (s)
Average Water Year	1997
Single-Dry Water Year	1989
Multiple-Dry Water Years	1988, 1989, 1990

Figure 3.5-1: Percent Annual Rainfall



California Water Service Company's water supply for the Hermosa-Redondo District is reliable during low rainfall periods. Table 3.5-2 shows during single dry years the demand increased by 5.2%; and during multi-dry year, the demand increased from 1.2 to 5.2%.

Table 3.5-2: Supply Reliability - AF Year (Table 8)				
Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
		Year 1	Year 2	Year 3
15,164	15,949	15,700	15,949	15,345
% of Normal	105.2%	103.5%	105.2%	101.2%

Although the historical record shows that the demand can be met by the supply, several factors posed against a reliable source is listed in Table 3.5-3.

Table 3.5-3: Factors Resulting In Inconsistency of Supply (Table 10)				
Name of supply	Legal	Environmental	Water Quality	Climatic
West Basin Municipal Water District	✓	✓		✓
Well 8-02			✓	
Well 22-01			✓	
Well 30-01			✓	

The viability of future supplies is contingent upon how these supplies influence or are affected by several critical conditions. These conditions include operational feasibility and reliability, supply reliability, economic incentive, economic effect on customers, and regional supply ramifications.

For an alternate water strategy to be acceptable, it must be feasible and add to the overall reliability of the distribution system. Treatment has been installed on all wells and the Hermosa-Redondo District has enough well capacity to produce all of its adjudicated rights for one year. However, accomplishing this is not practical since it requires that each of the three wells operate full time 365 days per year. Therefore, additional wells are needed in the district to fully utilize the available adjudicated right. The distribution system has the capacity to deliver the current and future demands of the District's customers. No additional major facilities are required to meet demand and maintain required pressures. However, developing additional production capacity can decrease the amount of money spent to purchase water and provide greater reliability during shortages. The cost of constructing facilities to provide additional production capacity increases as more facilities are constructed; at some point, the revenue requirements to finance this construction exceed the savings generated by the added capacity.

There are conditions that complicate the sightings of well facilities in the West Coast Basin. If these conditions are encountered, they can increase the costs of well development. If the well encounters saline water during development or during operation, desalination facilities would need to be installed to accommodate poor quality. Subsequently, additional property and equipment may be required, which would

substantially drive up the total water cost. It is the Company's objective to provide facilities sufficient to maintain adequate production capacity in order to properly exercise the district's annual adjudicated rights and to take full advantage of economic incentives offered by MWDSC and WRDSC.

The reliability of MWDSC's imported water supplies has deteriorated in recent years. Because of this deterioration, Metropolitan has implemented programs that provide:

- Financial incentives for development of local supplies
- Seasonal use of imported supplies in a manner that maximizes importation into southern California
- Storage of surplus imported supplies for future use
- Restoration of the usability of contaminated local groundwater

As a regulated utility, the expense of purchasing or producing water is passed directly through to the customer; a utility can only earn money on the investment made in the utility plant—the equipment and facilities needed to produce and deliver water. Cal Water is committed to pursuing alternatives that provide the lowest achievable water cost without burdening customers and the Company with unjustified and extravagant plant expenses.

Cal Water regularly reviews and comments on the proposed water rates of regional water supply and management agencies. The Company was instrumental in developing and promoting the In-lieu Replenishment concept in the 1960's and today is striving, through its work with regional water agencies, to improve these programs by maintaining the economic incentives and regional supply benefits.

For these programs to be successful, MWDSC and WRDSC must guarantee incentives for a given level of participation. It is anticipated that periodic dry spells will result in temporary suspension of the programs, resulting in delayed investment paybacks. If no assurance is provided that full-scale incentives will be maintained, projects that now appear feasible could burden ratepayers in the future.

Conversely, as water rates change, projects that appear not to be cost effective today may become economically feasible in the future.

Any program that modifies the operational strategy of the district or requires the installation of additional facilities to enhance supply reliability must, prior to being implemented, be evaluated to determine what impact that project will have on regional supply conditions. These ramifications are interrelated; impacting one will affect the others.

Supply conditions include the following:

- The West Coast Basin is an adjudicated groundwater basin.
- Seawater intrusion barriers exist within the basin.
- The West Basin Municipal Water District offers a reclamation program.

- Basin overdraft has caused declining groundwater levels.
- Shortages of available imported water supplies will become more frequent.

3.5.1 Water Quality

The drinking water delivered in the Hermosa-Redondo District, whether its source was groundwater or imported water, must meet or surpass all federal and state regulations. The U.S. Environmental Protection Agency under the authorization of the Federal Safe Drinking Water Act of 1974, sets drinking water standards. The California Department of Health Services (DOHS), which can either adopt the USEPA standard or establish state standards that are more stringent, enforces the EPA mandated drinking water regulations.

There are two types of drinking water standards: Primary and Secondary. Primary Standards are designed to protect public health by establishing Maximum Contamination Levels (MCL) for substances in water that are determined to be harmful to human health. MCLs are established conservatively for each contaminant based on health effects that may occur if a person were to drink two liters of the water per day for 70 years. Secondary Standards are based on the aesthetic qualities of the water, such as taste, odor, color, and mineral content. These standards, established by the State of California, specify limits for substances that may affect aesthetics and consumer acceptance of the water.

Although the water delivered to the customers always was in compliance with all standards, the quality of the groundwater produced by the district's three active wells tend to be highly mineralized and began to exceed the secondary standards for iron and manganese. These sources were immediately taken out of service and Cal Water has developed treatment for these facilities. These three wells extract water in close proximity of the intruded plume of seawater that is inland of the West Coast Basin Barrier. All three wells are treated to remove iron and manganese and disinfected with chloramine prior to distribution.

4 Water Shortage Contingency Plan

4.1 Worst Case Water Supply Availability

The water sources for Cal Water's Hermosa-Redondo District are historically 85% imported water purchased from WBMWD, 14% groundwater, with the remaining 1% provided from recycled supplies. Cal Water is taking steps to alter this source use ratio by maximizing the pumping of its groundwater rights. The only formal entitlement to the imported water from MWD is the obligation associated with the Tier 1 Water as discussed previously. MWD's water Surplus and Drought Management Plan provides policy guidance on drought management. Should supplies become limited to the point where imported supplies are curtailed, the WBMWD would allocate water through a calculation of need as opposed to any historical purchases. MWD and its member agencies have not yet decided on a formula for the allocation calculation.

4.2 Stages of Action

California Water Service Company has developed a four-stage rationing plan. The plan includes voluntary and mandatory stages. Approval from the CPUC must be obtained prior to implementation of mandatory restrictions

Table 4.2-1: Consumption Reduction Methods (Table 27)

SHORTAGE	STAGE	DEMAND REDUCTION GOAL	TYPE OF PROGRAM
Minimum 5 - 10%	Stage 1	10% reduction	Voluntary
Moderate 10 - 20%	Stage 2	20% reduction	Voluntary or Mandatory*
Severe 20 - 35%	Stage 3	35% reduction	Mandatory*
Critical 35 - 50%	Stage 4	50% reduction	Mandatory*

* Mandatory = Allocations

4.2.1 Actions to Be Undertaken By California Water Service Company

The following outline lists the actions to be taken during periods when a reduction in consumption is required:

Stage 1

- California Water Service Company maintains an ongoing public information campaign consisting of distribution of literature, speaking engagements, monthly bill inserts, and conservation messages printed in local newspapers.
- Educational programs in area schools are also ongoing.

Stage 2

- California Water Service Company will aggressively continue its public information and education programs.
- Ask consumers for 10 to 20 percent voluntary or mandatory water use reductions.

- Prior to implementation of mandatory reductions, obtain approval from CPUC.
- Lobby for passage of drought ordinances by appropriate governmental agencies.

Stage 3

- Implement mandatory reductions after receiving approval from CPUC.
- Maintain rigorous public information campaign explaining water shortage conditions.
- Water use restrictions go into effect; prohibited uses can include watering resulting in gutter flooding, using a hose without shutoff device, filling of pools or fountains, etc.
- Limiting landscape irrigation by restricting the hours of the day and or days of the week during which water for irrigation can be used.
- Monitor production weekly for compliance with necessary reductions.
- Installation of a flow restrictor on the service line of customers who consistently violate water use restrictions.

Stage 4

- All of steps taken in prior stages intensified.
- Monitor production daily for compliance with necessary reductions.

4.2.2 Mandatory Prohibitions

Due to Cal Water's investor-owned status, it is not authorized to pass any ordinances. However, municipalities, at the urging of Cal Water, have implemented conservation ordinances.

Should conditions warrant mandatory reductions, Cal Water will request authority to add Tariff Rule 14.1, Mandatory Water Conservation Plan (see Appendix E), to existing tariffs for a district. Included in Rule 14.1 is Section A. Conservation - Nonessential or Unauthorized Water Use, which prohibits use of water for filling or refilling of swimming pools, use of water which results in flooding or runoff in gutters, etc.

4.2.3 Coordination

Cal Water's Hermosa-Redondo District coordinates activities with 34 other member agencies through WBMWD in addition to other non-member water purveyors in the area. As a member agency, Cal Water participated in the development of the WBMWD Water Shortage Contingency Plan. Proposed Programs in West Basin's plan include:

- West Coast Basin Judgment Work Group - Representatives of the West Basin Water Association are developing possible amendments to provide more flexible operations during drought, expansion of storage and conjunctive operation of the basin, and innovative water management practices.
- Water Supply and Drought management planning
- Implementation of the Best Management Practices through a Memorandum of Understanding.
- West Basin Reclamation Program
- West Basin Saline Plume Mitigation Planning

4.2.4 Consumption Limits

California Water Service Company maintains extensive water use records on individual metered customer accounts. These records are reviewed in the districts on a daily basis to identify potential water loss problems.

4.2.5 Monitoring Procedure during Periods of Water Shortages

During all stages of water shortages, daily production figures will be reported to and monitored by the district manager on a daily basis. Percentage reductions in water allotments will be established by:

- Allocations for each customer are the percentage of the quantity of water used by such customer during the comparable billing periods during the historical base period (usually a non-drought year). Customer classes may have differing allocations. Percentage reductions may vary seasonally.
- Each customer will be notified of their allotment for the succeeding three months in their monthly bill. Any customer may appeal their allocation on the basis of use or incorrect calculation. Appeals shall be processed in the district on a case by case basis.
- No customer will receive a monthly allocation of less than 6 Ccf (hundred cubic feet) and no dwelling unit will receive a monthly allocation of less than 4 Ccf.

4.2.6 Penalties or Charges for Excessive Use

For all customers, an excess use penalty per Ccf of water used in excess of the applicable allocation during each billing period shall be charged. A distinction may be made between residential and non-residential penalties.

Cal Water, after one written warning, shall install a flow-restricting device on the service line of any customer observed by Cal Water personnel to be using water for any non-essential or unauthorized use defined in Section A of Tariff Rule 14.1 (see Appendix D). Repeated violations of unauthorized water use will result in discontinuance of water service.

Table 4.2-2: Penalties and Charges (Table 28)

Penalties or Charges	Stage When Penalty Takes Effect
Written warning	1,2
Flow-restricting device	3
Discontinuance of water service	4

4.2.7 Analysis of Revenue and Expenditure Impacts

California Water Service Company is an investor-owned water utility and, as such, is regulated by the CPUC. On March 8, 1989, the Commission instituted an investigation to determine what actions should be taken to mitigate the effects of water shortages on the State's regulated utilities and their customers. In decision D. 90-07-067, effective July 18, 1990, the Commission authorized all utilities to establish memorandum accounts

to track expenses and revenue shortfalls caused both by mandatory rationing and by voluntary conservation efforts. Subsequently, D. 90-08-55 required each Class A utility (more than 10,000 connections) seeking to recover revenues from a drought memorandum account to submit for Commission approval a water management program that addresses long-term strategies for reducing water consumption. Utilities with approved water management programs were authorized to implement a surcharge to recover revenue shortfalls recorded in their drought memorandum accounts.

However, the Commission's Decision 94-02-043 dated February 16, 1994, states:

> *10. Now that the drought is over, there is no need to track losses in sales due to residual conservation.*
> *11. The procedures governing voluntary conservation memorandum accounts (see D.92-09-084) developed in this Drought Investigation will no longer be available to water companies as of the date of this order.*
> *12. Procedures and remedies developed in the Drought Investigation that are not specifically authorized for use in the event of future drought in these Ordering Paragraphs will no longer be available to water companies as of the date of this order except upon filing and approval of a formal application.*
> *(CPUC Decision 94-02-043, Findings of Fact, paragraphs 10-12)*

It was at this time that Cal Water significantly curtailed conservation activities. At the time that triggers for voluntary or mandatory reductions should occur in the future, Cal Water will determine if a filing to the CPUC is necessary to enforce the reductions and to begin tracking lost sales from the required reductions.

4.2.8 Implementing the Plan

Cal Water is an investor-owned water utility, and as such is subject to regulation by the CPUC. Section 357 of the Water Code requires that suppliers that are subject to regulation by the CPUC shall secure its approval before imposing water consumption regulations and restrictions required by water shortage emergencies.

4.3 Supply Shortage Triggers

The Hermosa-Redondo District's main source of supply is purchased through the West Basin Municipal Water District, which obtains all of their supply from the Metropolitan Water District of Southern California (MWDSC). Rationing stages will be implemented at the request of MWDSC through WBMWD due to any reduction of supply (see "Drought Plan for the Central Basin and West Basin Area" December 1991 and the Drought Contingency Plan for Metropolitan Water District, December 26, 1991). Triggers stated herein automatically implement the appropriate Stage of Action, unless the CPUC adopts findings to implement a less restrictive Stage. Since the Hermosa-Redondo District receives water that is classified by MWDSC as "Firm", Cal Water's Stage of Action would be based on MWDSC's percent reduction for "Firm Water" only. Shortages may trigger a change in Stage at any time. Water supply triggers levels are listed in the following Table 4.3-1.

Table 4.3-1: Water Supply Triggering Levels	
Stage	% Shortage
Stage 1	Up to 10% supply reduction
Stage 2	10 to 20% supply reduction
Stage 3	20 to 35% supply reduction
Stage 4	35 to 50% supply reduction

4.4 Three-Year Minimum Water Supply

Table 4.4-1 lists the minimum water supply for the next three years based on current trends of the supply. The normal volume is based on the average demand that is projected for 2005. The three year minimum volume is based on the projected low demand for the years 2005 to 2007.

Table 4.4-1: Three-Year Estimated Minimum Water Supply (Table 24) AFY				
Source	Normal	Year 1	Year 2	Year 3
West Basin Municipal Water District	13,027	9,606	9,562	9,518
Recycled Water	146	66	66	66
Groundwater Wells	2,500	2,500	2,600	2,700
Total	15,673	12,172	12,228	12,284

4.5 Catastrophic Water Supply Interruption

During an actual or threatened temporary shortage of imported water to the West Basin, the WRDSC is authorized by the West Coast Basin Judgment to enter into agreements with water purveyors in the basin that allow the over-extraction of groundwater. This authorized over-extraction can last for four months and may be used to produce a maximum of 10,000 acre-feet. Such agreements are not subject to the "make-up" provisions of the Judgment. If the shortage continues beyond four months, further over-extraction would require court approval. The Hermosa-Redondo District, because of the limited capacity to produce groundwater, currently is not in the position to participate in any authorized over-extraction program. As a result, the district's customers would be exposed to the full effect of a shortage.

There are 12 emergency connections in the Hermosa-Redondo District: three are with Cal Water's Palos Verdes District, six are with Cal Water’s Dominguez system, one that is with the City of Torrance, one with the City of Manhattan Beach, and one with the City of El Segundo.

If the emergency were a complete loss of MWDSC's capability to deliver water to the region, then the Hermosa-Redondo District would have major disruption in service. The three Palos Verdes District connections are only capable of delivering imported water from MWDSC's distribution system. Only the emergency connection with Cal Water's Dominguez system, the City of Torrance and the one with the City of Manhattan Beach can deliver groundwater, and the ability to do so would depend on their having an excess in production capacity.

4.6 Transfer or Exchange Opportunities

The lease or purchase of additional Adjudicated Water Rights could be utilized to achieve increased supply reliability and availability. The district has lost production capacity due to the saline contamination of local groundwater and has become active in leasing its unused annual water rights.

5 Water Use Provisions

5.1 Distribution of Services

California Water Service Company designates the different customers as follows:

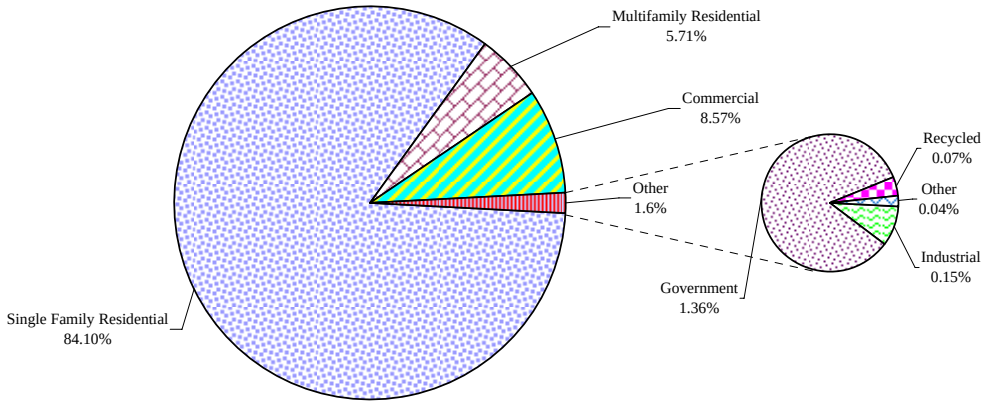
- Single Family Residential
- Multifamily Residential
- Commercial
- Industrial
- Government
- Other

The residential sector of CWS water service customers includes permanent single and multifamily residents. Service for seasonal customers was not considered.

Property redevelopment is the trend in the Hermosa-Redondo District where small beach resort cottages on large urban lots are being converted into large single family homes or multifamily facilities with few units. Service counts during the 1980s verify this trend. In 1980, there were 11.7 multifamily units per multifamily residential service, while in 1990 this number declined to 10.5 units per service.

Average annual services for the calendar year 2004 numbered 25,626. Single family residential services totaled 21,551 or 84.1% of all services; multifamily residential services totaled 1,464 or 5.7%; and commercial totaled 2,195 or 8.6%. All other customer classes comprised the remaining 1.6%. The distribution of services for the Year 2004 is shown in Figure 5.1-1.

Figure 5.1-1: Distribution of Services (2004)



5.2 Historical and Current Water Demand

Demand per service was established as a function of historical sales and service data. Projected demand is the mathematical product of total projected services and demand per service. Historical sales values are illustrated in Figure 5.2-1. Historical service counts for the district are illustrated in Figure 5.2-2.

Prior to the drought years of 1990 to 1991, the combined demand per service for all services remained fairly stable at an annual average of 220,000 gallons per service, Figure 5.2-3. After the drought, demand has gradually increased, but has remained below pre-drought levels and for the past ten years has been consistently below 200,000 gallons per service per year. The reason for this consistent reduction in demand per service is due to the installation of conservation hardware. The Company's conservation goal of a 10% reduction in demand (based on pre-drought levels) has been accomplished. Implementation of Best Management Practices has and will continue to enable the district to achieve this goal. This reduction in demand is particularly apparent in the multifamily residential customer class where an aggressive regional program to replace inefficient toilets has been underway.

Figure 5.2-1: Historical Sales

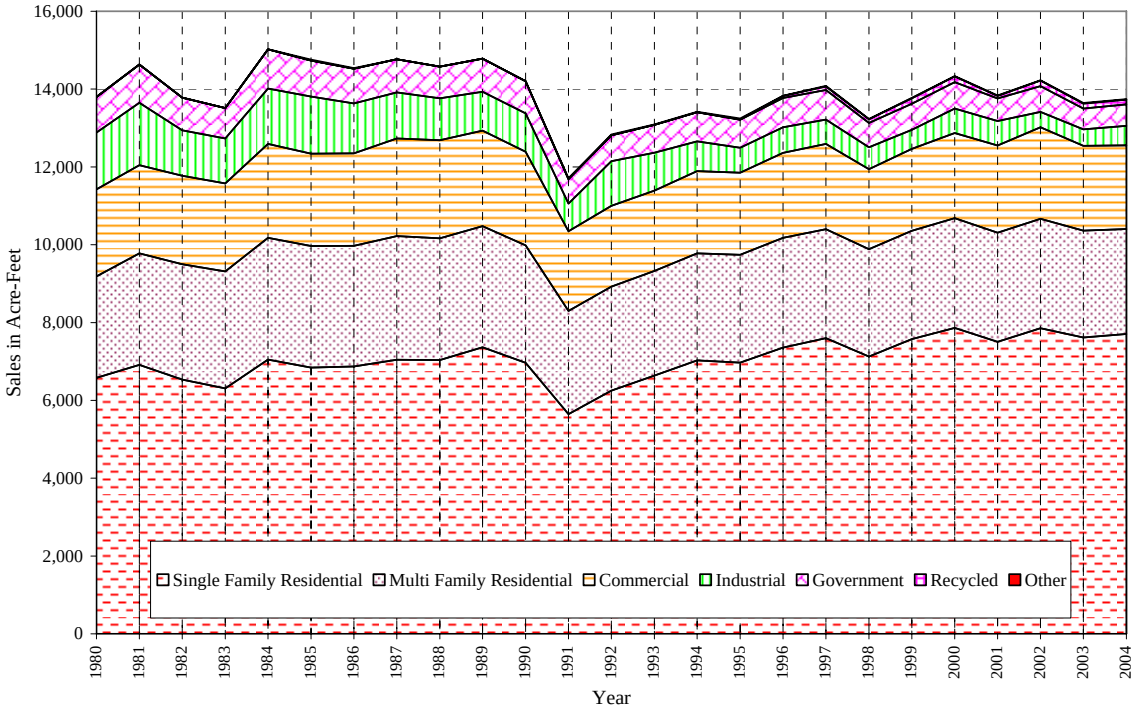


Figure 5.2-2: Historical Service Counts

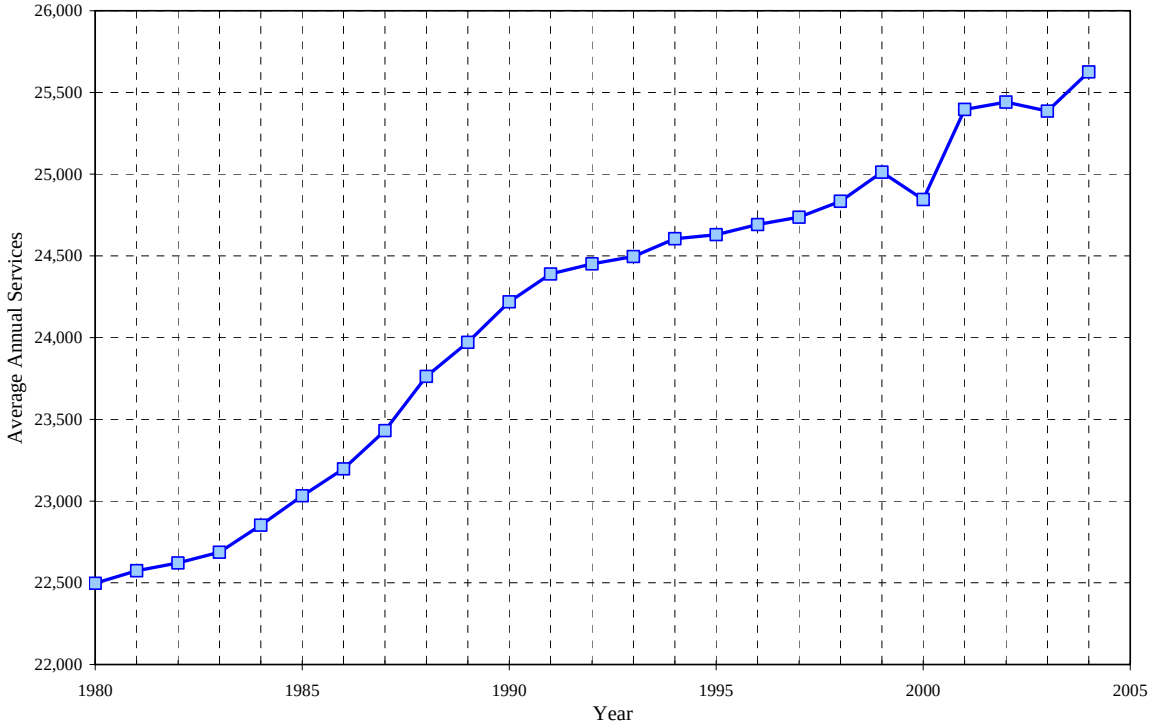


Figure 5.2-3: Combined Historical Demand per Service

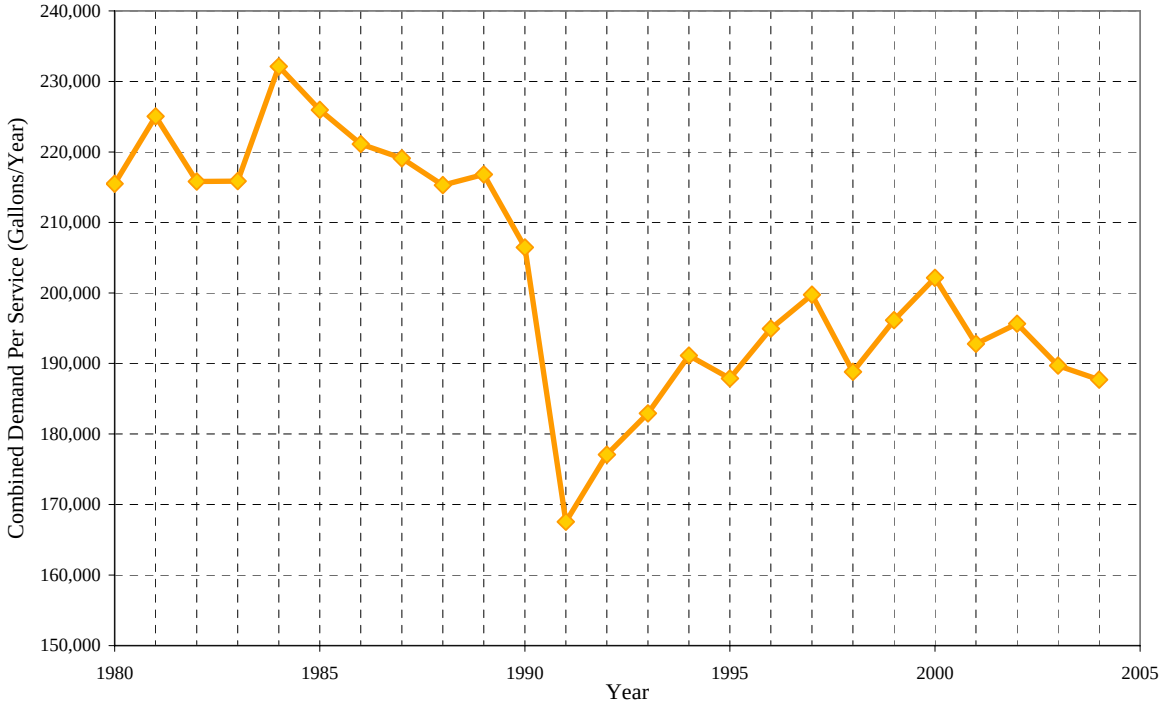


Figure 5.2-3 shows a sharp decline in demand per service from 1989 to 1991 due to rationing that was occurring during the drought California experienced during 1987-1992. After 1991 the demand steadily increased but leveled to value below that of pre-drought period. Figures 5.2-4 to 5.2-8 show the demand per service for Single Family Residential, Multifamily Residential, Commercial, Industrial, and Government, respectively. Single Family Residential shows a dip in demand during the drought period, but demand returns to pre-drought condition. Multifamily Residential shows a gradual decrease in demand during the drought period, but remains at a lower level after the drought period. Commercial remained relatively level through out the drought period. Industrial and Government demand has had a steady decline since the 1980.

The overall decrease in demand can be attributed to the conservation measures employed in the district. This can be especially seen in the Multifamily Residential demand which decreased the annual demand by 150,000 gallons per service, Figure 5.2-5.

Figure 5.2-4: Single Family Residential Demand per Service

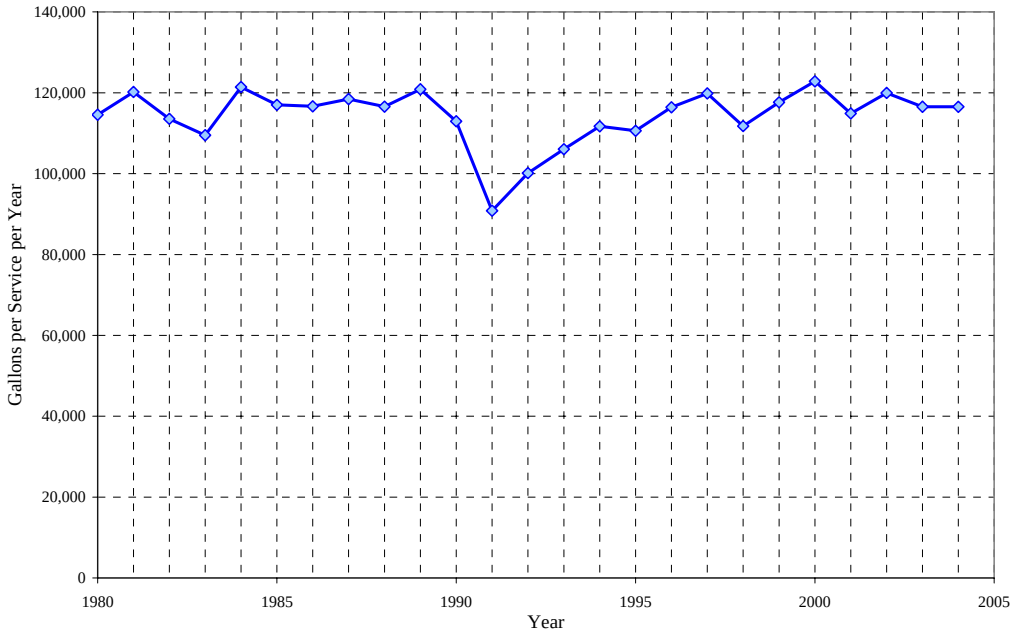


Figure 5.2-5: Multifamily Residential Demand per Service

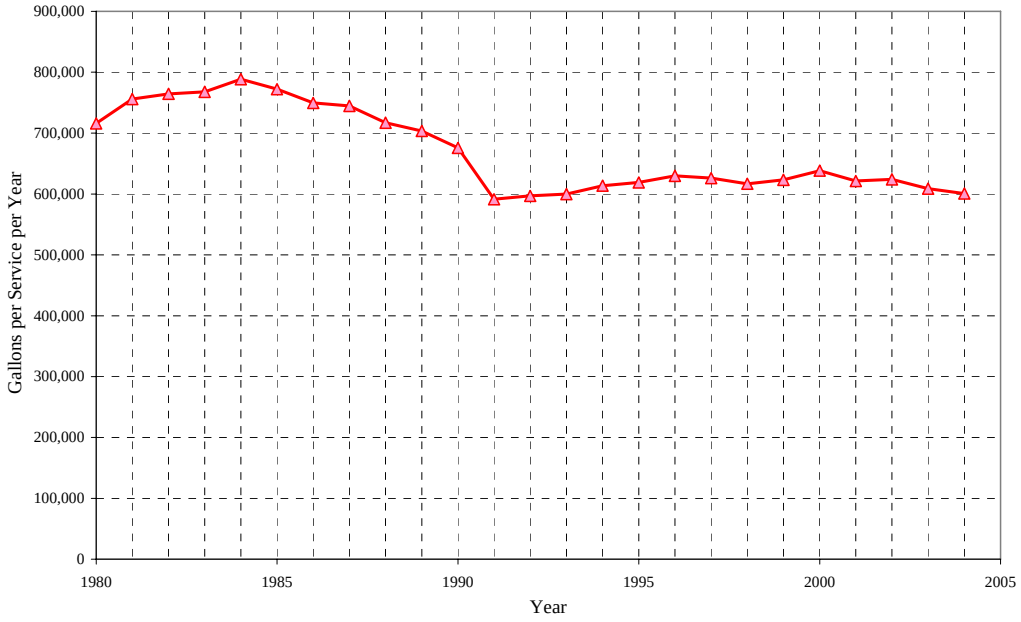


Figure 5.2-6: Commercial Demand per Service

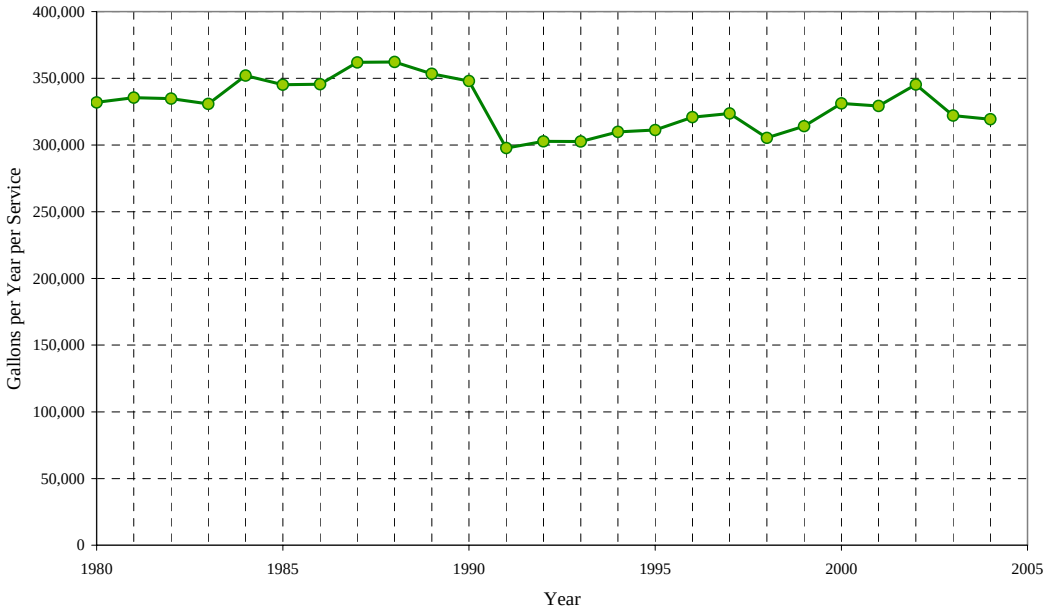
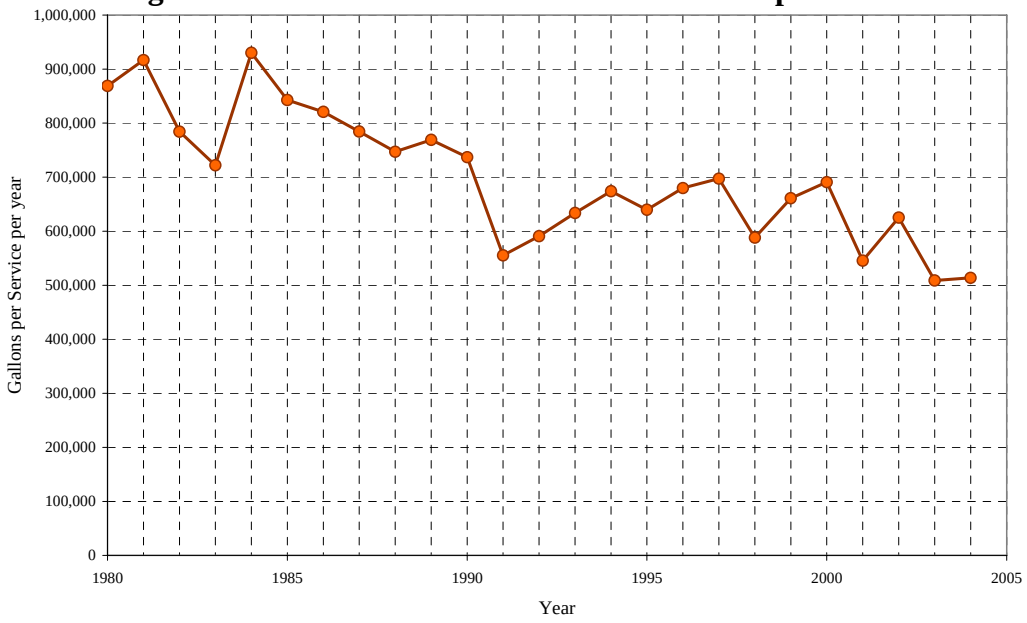


Figure 5.2-7: Industrial Demand per Service

Figure 5.2-8: Governmental Historical Demand per Service



5.3 Per Capita Water Demand

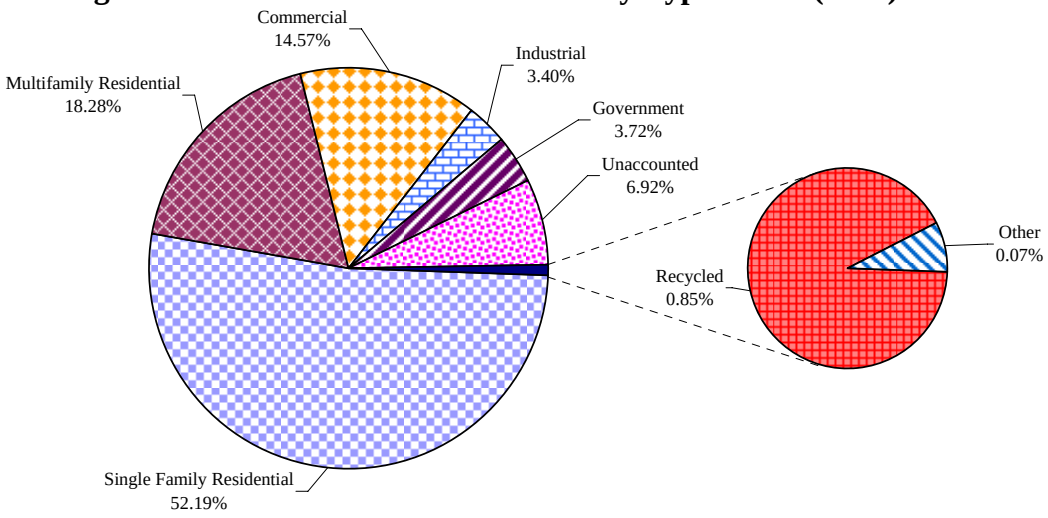
Based on the end of 2004 year total demand, the per-capita water use in the district is summarized in Table 5.3-1. Water use averaged 135.7 gallons per-capita per day based on the 2004 total demand (4,810 million gallons) and Hermosa-Redondo District's population of 97,090. In comparison, the statewide and south coast regional averages

were 190 gallons per capita per day. This 20% lower per capita demand is due to the district's high density and the coastal climate.

Table 5.3-1: Per Capita Water Demand (2004)		
Units	All Users	Residential
Million Gallons	4,810.4	3,390.2
Estimated Population	96,800	96,800
Gallons/Person in Year	49,695	35,022
Gallons Per Capita Per Day	136.1	96.0
Gallons Per Capita Per Minute	0.095	0.067

Total system demand was projected by multiplying the number of services by the demand for each customer class. Single family residential water use represents the smallest demand per service, yet this category uses 52% of the total demand. Multifamily residential use accounts for 18% of the total demand, for a combined residential total of 70%. Unaccounted for water averages 6.9%, which is within acceptable levels.

Figure 5.3-1: Percent of Total Demand by Type of Use (2004)

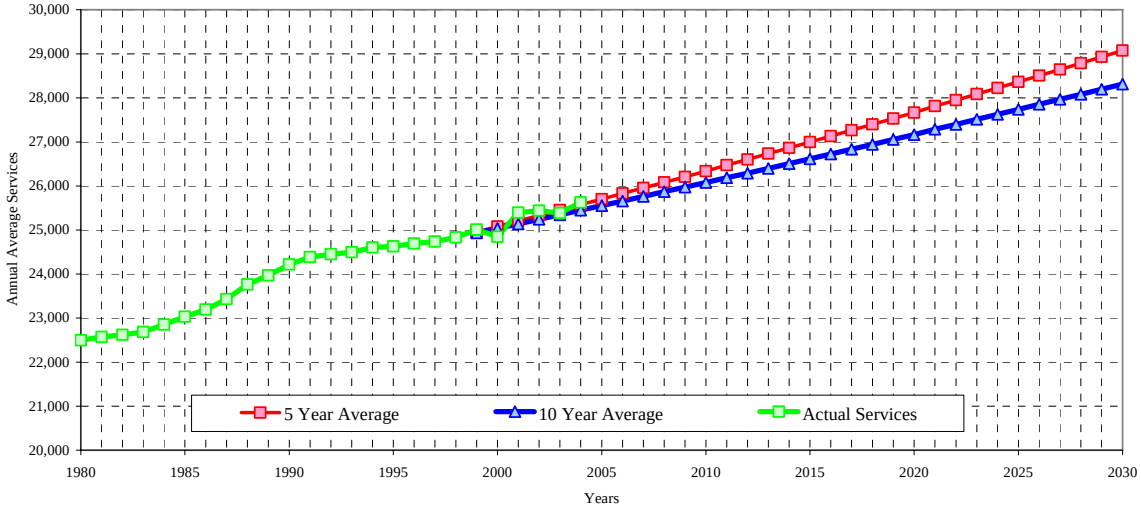


5.4 Historical and Projected Water Demand

Two growth rates were considered in preparing this management plan, the continuation of the five-year and ten-year average growth patterns. However, based on the above noted land use conditions only the continuation of the short term (5 year) average service connection growth rate was used to develop the scenarios for projecting demand requirements to the year 2030. Both growth patterns are illustrated in Figure 5.4-1.

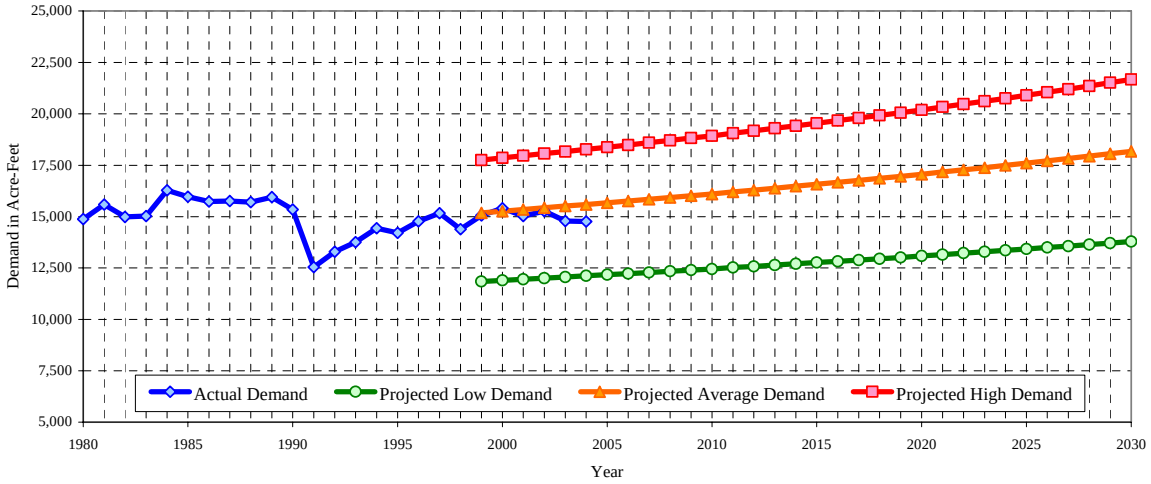
The short-term growth rate, calculated from the five-year period (2000 to 2004), exhibits an overall annual average growth rate of 0.49 percent. However, service counts for each customer class such as residential, commercial and other uses, tends to grow at a different rate. Therefore, the application of short-term growth as a factor in the projection of the annual number of service connections was done based on customer class.

Figure 5.4-1: Historical & Projected Services



Three projection scenarios were used to develop a range of projected demand for the Hermosa-Redondo District. The previously discussed service connection growth pattern was applied to three different sets of demand per service data. Data generated through each scenario is compiled and located separately in Appendix B (Worksheets 10, 11, and 12). Comparative demand data for the three scenarios is presented in Figure 5.4-2. The starting point for each projection was the actual annual average number of services in 1998. This provides a comparison of projected values to actual values over a several-year period.

Figure 5.4-2: Historical & Projected Demand



5.4.1 Scenario 1

The short-term annual growth pattern applied to the lowest demand per service value since 1980 for each customer class projects a total demand for the year 2030 at 13,248 AF (without system losses), see Table 5.4-1. This lowest customer class demand was noticeably influenced by the drought and by the regional drought management program in place starting in 1991. This scenario provides a valid bottom for the projected demand range and indicates the level to which demand can be reduced without impacts to public health and safety.

5.4.2 Scenario 2

The short-term annual growth pattern combined with the average recorded demand per service value since 1980 for each customer class projects a total demand for the year 2030 at 16,884 AF (without system losses). This scenario represents the normal demand, which would most likely occur provided the Company's 10% conservation goal is achieved and maintained. To accomplish this level of demand, appropriate conservation programs must be effectively implemented. However, with any effective conservation program comes some degree of demand hardening, a condition that reduces a community's ability to respond to future shortages with reduced consumption. The Hermosa-Redondo District demonstrated that it was capable of reducing water demand by 20% based on demand per service values. As conservation reduces demand per service from 220,000 to 200,000 gallons per service per year, the flexibility of the district to provide further essential demand reductions may be limited to ten or fifteen percent. Average system demand in 5-year increments is shown in Table 5.4-2.

5.4.3 Scenario 3

The short-term annual growth pattern combined with the highest recorded demand per service value since 1980 for each customer class projects a total demand for the year 2030 at 19,727 AF (without system losses). This scenario provides a valid top for the projected demand range and illustrates to what level demand could escalate if conservation efforts fail. High system demand in 5-year increments is shown in Table 5.4-3.

Table 5.4-1: Past, Current, and Projected Water Deliveries for Scenario 1 (Table 12a)

		Water Use Sectors	Single family	Multifamily	Commercial	Industrial	Institutional/Gov.	Landscape/ Agriculture	Recycled	Other	Total
2000	metered	# of accounts	20,867	1,439	2,153	34	319	-	19	14	24,845
		Deliveries AFY	7,864	2,819	2,188	632	676	-	147	9	14,335
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2005	metered	# of accounts	21,590	1,467	2,220	42	357	-	19	8	25,703
		Deliveries AFY	6,018	2,663	2,006	405	536	-	66	3	11,696
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2010	metered	# of accounts	22,188	1,475	2,232	48	366	-	19	8	26,337
		Deliveries AFY	6,184	2,676	2,018	472	550	-	66	3	11,968
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2015	metered	# of accounts	22,803	1,482	2,253	56	375	-	19	9	26,997
		Deliveries AFY	6,356	2,690	2,037	549	564	-	66	3	12,264
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2020	metered	# of accounts	23,435	1,489	2,266	65	384	-	19	9	27,667
		Deliveries AFY	6,532	2,703	2,048	639	578	-	67	3	12,569
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2025	metered	# of accounts	24,084	1,497	2,287	75	394	-	19	9	28,365
		Deliveries AFY	6,713	2,717	2,068	742	593	-	67	3	12,902
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2030	metered	# of accounts	24,751	1,504	2,300	86	404	-	19	9	29,074
		Deliveries AFY	6,899	2,730	2,079	862	608	-	67	3	13,248
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-

Table 5.4-2: Past, Current, and Projected Water Deliveries for Scenario 2 (Table 12b)

		Water Use Sectors	Single family	Multifamily	Commercial	Industrial	Institutional/Gov.	Landscape/ Agriculture	Recycled	Other	Total
2000	metered	# of accounts	20,867	1,439	2,153	34	319	-	19	14	24,845
		Deliveries AFY	7,864	2,819	2,188	632	676	-	147	9	14,335
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2005	metered	# of accounts	21,590	1,467	2,220	42	357	-	19	8	25,703
		Deliveries AFY	7,572	3,020	2,196	869	720	-	146	9	14,533
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2010	metered	# of accounts	22,188	1,475	2,232	48	366	-	19	8	26,337
		Deliveries AFY	7,782	3,035	2,208	1,013	739	-	146	10	14,933
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2015	metered	# of accounts	22,803	1,482	2,253	56	375	-	19	9	26,997
		Deliveries AFY	7,997	3,050	2,230	1,179	758	-	147	10	15,372
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2020	metered	# of accounts	23,435	1,489	2,266	65	384	-	19	9	27,667
		Deliveries AFY	8,219	3,065	2,242	1,372	778	-	147	10	15,834
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2025	metered	# of accounts	24,084	1,497	2,287	75	394	-	19	9	28,365
		Deliveries AFY	8,447	3,081	2,264	1,594	799	-	148	10	16,342
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2030	metered	# of accounts	24,751	1,504	2,300	86	404	-	19	9	29,074
		Deliveries AFY	8,681	3,096	2,277	1,852	820	-	148	11	16,884
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-

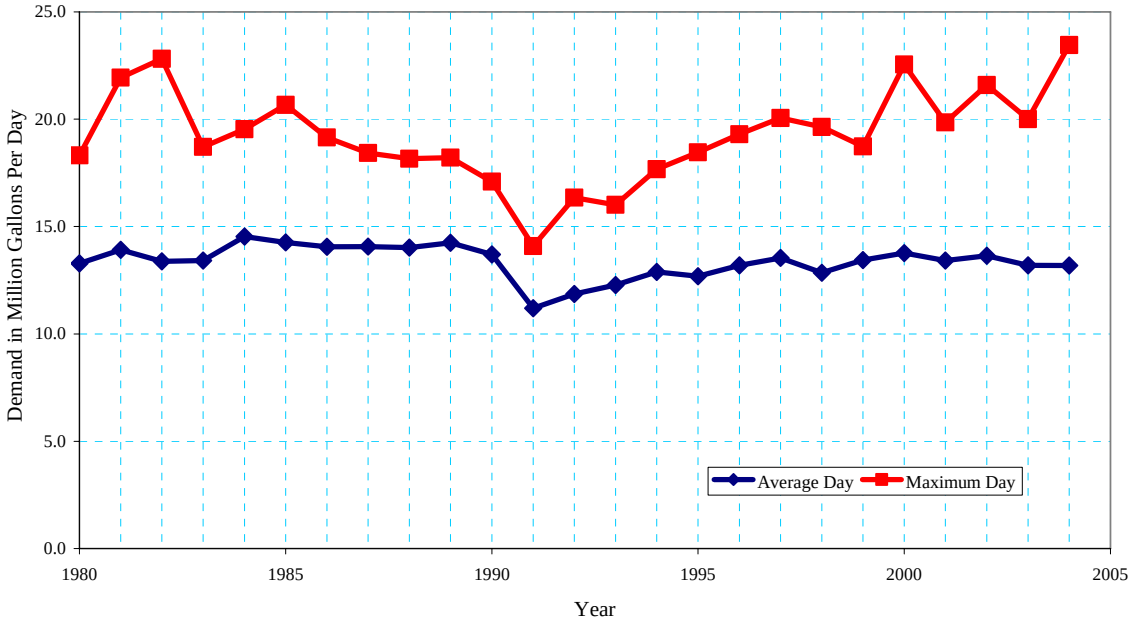
Table 5.4-3: Past, Current, and Projected Water Deliveries for Scenario 3 (Table 12c)

		Water Use Sectors	Single family	Multifamily	Commercial	Industrial	Institutional/Gov.	Landscape/ Agriculture	Recycled	Other	Total
2000	metered	# of accounts	20,867	1,439	2,153	34	319	-	19	14	24,845
		Deliveries AFY	7,864	2,819	2,188	632	676	-	147	9	14,335
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2005	metered	# of accounts	21,590	1,467	2,220	42	357	-	19	8	25,703
		Deliveries AFY	8,137	3,551	2,392	1,381	944	-	227	29	16,660
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2010	metered	# of accounts	22,188	1,475	2,232	48	366	-	19	8	26,337
		Deliveries AFY	8,362	3,568	2,406	1,609	969	-	228	29	17,171
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2015	metered	# of accounts	22,803	1,482	2,253	56	375	-	19	9	26,997
		Deliveries AFY	8,594	3,586	2,429	1,872	995	-	229	30	17,735
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2020	metered	# of accounts	23,435	1,489	2,266	65	384	-	19	9	27,667
		Deliveries AFY	8,832	3,604	2,443	2,178	1,021	-	229	31	18,338
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2025	metered	# of accounts	24,084	1,497	2,287	75	394	-	19	9	28,365
		Deliveries AFY	9,076	3,622	2,467	2,531	1,048	-	230	32	19,005
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2030	metered	# of accounts	24,751	1,504	2,300	86	404	-	19	9	29,074
		Deliveries AFY	9,328	3,640	2,481	2,939	1,076	-	230	32	19,727
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-

5.5 Average Day and Maximum Day Demand

The historical values for average and maximum days from 1980 to the present are shown in Figure 5.5-1.

Figure 5.5-1: Average Day & Maximum Day



The estimated average day demand to the year 2030 was based on projected demand and anticipated service connections for each of the three scenarios. The maximum day demand was calculated on the historical ratio between maximum day demand and average day demand, which is 1.53:1. The calculated values are shown in Table 5.5-1.

Using Scenario #2, the 2030 total average day demand is projected at 16.22 mgd (18,174 AFY) and the maximum day demand at 24.82 mgd (27,806 AFY). Resulting values are slightly more than the five, ten, and twenty-year averages for these parameters, but within the range of experienced values. Scenario #2 represents conditions that are achievable by the existing distribution system.

For Scenario #3, which is based on high demand per service, the projected total average day demand for 2030 is 19.34 mgd (21,669 AFY) with a maximum day demand of 29.6 mgd (33,154 AFY). The projected values are higher than the five, ten, and twenty-year averages, and for that matter higher than most historical rates of delivery. The highest maximum day demand recorded and delivered during the past twenty years was 23.5 mgd (26,278 AFY) in 2004.

The ability of the distribution system to deliver projected future demands was evaluated using a computer-generated hydraulic network. This analysis indicates that the existing distribution system is capable of delivering even the unlikely, yet potential, maximum

day demand of 30.0 mgd (33,604 AFY) while maintaining pressure throughout the system at levels above the approved California Public Utilities Commission standard.

Table 5.5-1: Average Day and Maximum Day Demand

Projected Year	Projected Annual		Average Day		Maximum Day		Max. Day To Ave. Day Ratio
	Demand (AF)	Demand (MG)	Demand (MG)	Use Per Service (gal)	Demand (MG)	Use Per Service (gal)	
2005							
Scenario 1	12,172	3,966	10.9	423	16.6	648	1.53
Scenario 2	15,673	5,107	14.0	544	21.4	834	1.53
Scenario 3	18,377	5,988	16.4	638	25.1	978	1.53
2010							
Scenario 1	12,456	4,059	11.1	422	17.0	647	1.53
Scenario 2	16,102	5,247	14.4	546	22.0	836	1.53
Scenario 3	18,931	6,169	16.9	642	25.9	983	1.53
2015							
Scenario 1	12,764	4,159	11.4	422	17.5	647	1.53
Scenario 2	16,570	5,399	14.8	548	22.7	839	1.53
Scenario 3	19,538	6,367	17.4	646	26.7	990	1.53
2020							
Scenario 1	13,082	4,263	11.7	422	17.9	647	1.53
Scenario 2	17,062	5,560	15.2	551	23.3	843	1.53
Scenario 3	20,186	6,578	18.0	651	27.6	998	1.53
2025							
Scenario 1	13,427	4,375	12.0	423	18.4	647	1.53
Scenario 2	17,601	5,735	15.7	554	24.1	849	1.53
Scenario 3	20,900	6,810	18.7	658	28.6	1,008	1.53
2030							
Scenario 1	13,787	4,492	12.3	423	18.9	649	1.53
Scenario 2	18,174	5,922	16.2	558	24.9	855	1.53
Scenario 3	21,669	7,061	19.3	665	29.6	1,019	1.53

5.6 Summary of Purchases

California Water Service Company only purchases imported water for the district from West Basin Municipal Water District and does not provide water to other agencies. California Water Service Company does not supply water for projects such as saline barriers or groundwater recharge and currently does not plan to do so in the future.

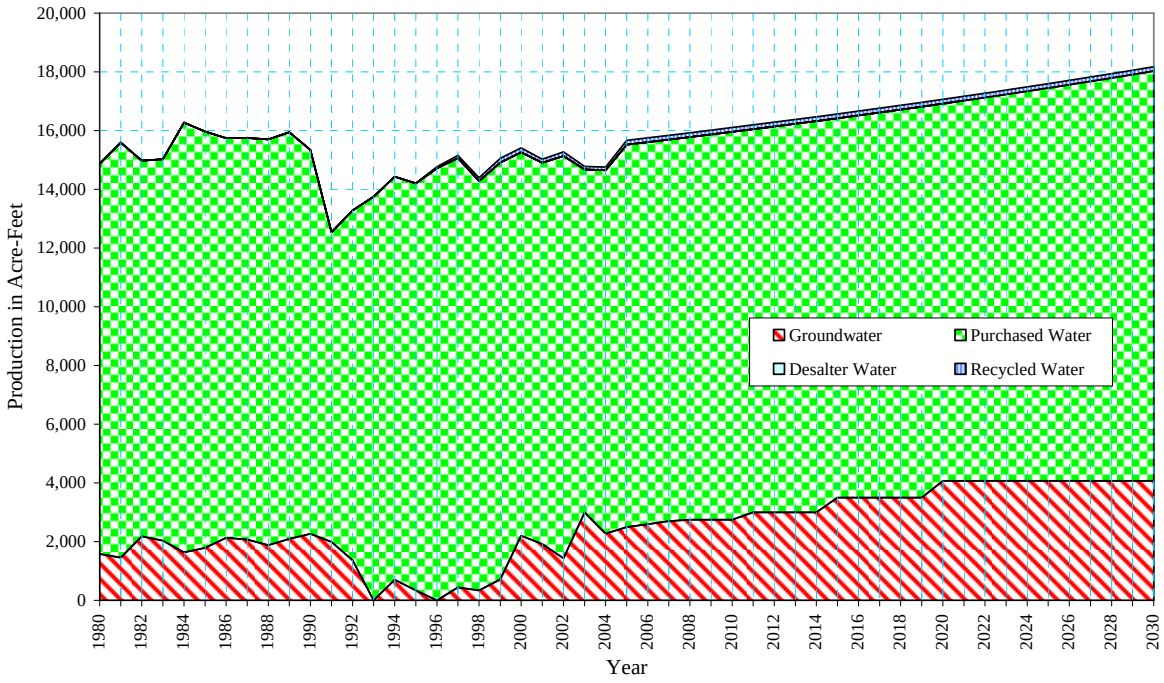
Table 5.6-1 lists other water uses in the district not discussed in Table 5.4-1 to 5.4-3. The projected values are based on average conditions.

Table 5.6-1: Additional Water Uses and Losses - AF Year (Table 13 and 14)							
Water Use	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Sales to Other Agencies	-	-	-	-	-	-	-
Saline barriers	-	-	-	-	-	-	-
Groundwater recharge	-	-	-	-	-	-	-
Conjunctive use	-	-	-	-	-	-	-
Raw water	-	-	-	-	-	-	-
Recycled	-	-	-	-	-	-	-
Unaccounted-for system losses	1,078	1,140	1,169	1,198	1,228	1,259	1,290
Total	1,078	1,140	1,169	1,198	1,228	1,259	1,290

The past, current, and projected water deliveries based on average projected consumption rate is presented in Table 5.6-2 and shown graphically in Figure 5.6-1.

Table 5.6-2: Total Water Use - AF Year (Table 15)							
Water Use	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Total of Tables 12, 13, 14	15,413	15,673	16,102	16,570	17,062	17,601	18,174

Figure 5.6-1: Historical & Average Projected Sources



The projected demand to be supplied by West Basin Municipal Water District is shown in Table 5.6-3. The low demand represents the minimum purchased water volume when the potential reduction by conservation by the customers can be met. The average scenario represents the normal amount of the demand provided the 10% conservation goal is maintained. The high demand scenario purchased volume if customer demand patterns returned to pre-drought non-conservation practices.

Table 5.6-3: Agency Demand Projections To Wholesale Supplier – AFY (Table 19)

Wholesaler	Demand		2010	2015	2020	2025	2030
West Basin Municipal Water District	Low	Import	9,560	9,117	8,864	9,210	9,570
		Recycle	146	147	147	147	147
		Total	**9,706**	**9,264**	**9,012**	**9,357**	**9,717**
	Average	Import	13,206	12,923	12,845	13,384	13,957
		Recycle	146	147	147	147	147
		Total	**13,352**	**13,070**	**12,992**	**13,531**	**14,104**
	High	Import	16,034	15,892	15,969	16,683	17,452
		Recycle	146	147	147	147	147
		Total	**16,181**	**16,038**	**16,116**	**16,830**	**17,599**

6 Supply and Demand Comparison

6.1 Normal-Year Comparison

Tables 6.1-1, 6.1-2, and 6.1-3 compare the current and projected water supply and demand based on average consumption (Scenario 2). The projected increase in demand is 16% at year 2030 when compared to 2005. Since the water supply is primarily purchased from a water wholesaler, the supply will equal the demand.

The tables also show a surplus amount of supply due to the water recycling estimated by the West Basin Municipal Water District. It is assumed that the overall usage by the district would decrease, thus the purchased amount would reduce as well; however, since California Water Service Company does not directly supply the recycled water to the customer, a decrease in the purchase amount is not assured.

Table 6.1-1: Projected Normal Water Supply - AF Year (Table 40)

(from Table 3-1)	2010	2015	2020	2025	2030
Supply	16,102	16,570	17,062	17,601	18,174
% of Normal Year (Table 9)	106%	109%	113%	116%	120%

Table 6.1-2: Projected Normal Water Demand - AF Year (Table 41)

(from Table 5.6-2)	2010	2015	2020	2025	2030
Demand	16,102	16,570	17,062	17,601	18,174
% of year 2005	103%	106%	109%	112%	116%

Table 6.1-3: Projected Supply and Demand Comparison - AF Year (Table 42)

	2010	2015	2020	2025	2030
Supply totals	16,102	16,570	17,062	17,601	18,174
Demand totals	16,102	16,570	17,062	17,601	18,174
Difference	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

6.2 Single Dry-Year Comparison

Examining the operational record of the district for the past 20 years, the district demand was greater during a single-dry year than it was during a normal year. The water demand would increase due to maintenance of landscape and other high water uses that would normally be supplied by precipitation. West Basin Municipal Water District 2005 Urban Water Management Plan (Appendix H) calls for additional supplies from Metropolitan Water District of Southern California during such periods.

Tables 6.2-1, 6.2-2, and 6.2-3 compare the current and projected water supply and demand based on high consumption rate (Scenario 3).

Table 6.2-1: Projected Single Dry-year Water Supply - AF Year (Table 43)					
	2010	2015	2020	2025	2030
Supply	18,931	19,538	20,186	20,900	21,669
% of projected normal	117.6%	117.9%	118.3%	118.7%	119.2%

Table 6.2-2: Projected Single Dry-year Water Demand - AF Year (Table 44)					
	2010	2015	2020	2025	2030
Demand	18,931	19,538	20,186	20,900	21,669
% of projected normal	117.6%	117.9%	118.3%	118.7%	119.2%

Table 6.2-3: Projected Single Dry-year Supply and Demand Comparison - AF Year (Table 45)					
	2010	2015	2020	2025	2030
Supply totals	18,931	19,538	20,186	20,900	21,669
Demand totals	18,931	19,538	20,186	20,900	21,669
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

6.3 Multiple Dry-Year Comparison

During a multiple dry-year, demand will be met by stricter enforcement of conservation methods as outlined in Section 4.

Tables 6.3-1, 6.3-2, and 6.3-3 compare the projected water supply and demand based on low consumption rate (Scenario 1) occurring between 2006-2010 with a comparison to the average annual consumption projection (Scenario 2).

Table 6.3-1: Projected Supply During Multiple Dry Year To 2010 (Table 46) AFY					
	2006	**2007**	**2008**	**2009**	**2010**
Supply	12,228	12,284	12,341	12,398	12,456
% of projected normal	77.6%	77.5%	77.5%	77.4%	77.4%

Table 6.3-2: Projected Demand Multiple Dry Year To 2010 (Table 47) AFY					
	2006	**2007**	**2008**	**2009**	**2010**
Demand	12,228	12,284	12,341	12,398	12,456
% of projected normal	77.6%	77.5%	77.5%	77.4%	77.4%

Table 6.3-3: Projected Supply And Demand Comparison To 2010 (Table 48) During Multiple Dry Year Period - AFY					
	2006	2007	2008	2009	2010
Supply totals	12,228	12,284	12,341	12,398	12,456
Demand totals	12,228	12,284	12,341	12,398	12,456
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

Tables 6.3-4, 6.3-5, and 6.3-6 compare the projected water supply and demand based on low consumption rate (Scenario 1) occurring between 2011-2015 with a comparison to the average annual consumption projection (Scenario 2).

Table 6.3-4: Projected Supply During Multiple Dry Year To 2015 (Table 49) AFY					
	2011	2012	2013	2014	2015
Supply	12,523	12,582	12,642	12,703	12,764
% of projected normal	77.3%	77.2%	77.2%	77.1%	77.0%

Table 6.3-5: Projected Demand Multiple Dry Year To 2015 (Table 50) AFY					
	2011	2012	2013	2014	2015
Demand	12,523	12,582	12,642	12,703	12,764
% of projected normal	77.3%	77.2%	77.2%	77.1%	77.0%

Table 6.3-6: Projected Supply And Demand Comparison To 2015 (Table 51) During Multiple Dry Year Period - AFY					
	2011	2012	2013	2014	2015
Supply totals	12,523	12,582	12,642	12,703	12,764
Demand totals	12,523	12,582	12,642	12,703	12,764
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

Tables 6.3-7, 6.3-8, and 6.3-9 compare the projected water supply and demand based on low consumption rate (Scenario 1) occurring between 2016-2020 with a comparison to the average annual consumption projection (Scenario 2).

Table 6.3-7: Projected Supply During Multiple Dry Year To 2020 (Table 52) AFY					
	2016	2017	2018	2019	2020
Supply	12,826	12,889	12,952	13,017	13,082
% of projected normal	77.0%	76.9%	76.8%	76.7%	76.7%

Table 6.3-8: Projected Demand Multiple Dry Year To 2020 (Table 53) AFY					
	2016	2017	2018	2019	2020
Demand	12,826	12,889	12,952	13,017	13,082
% of projected normal	77.0%	76.9%	76.8%	76.7%	76.7%

Table 6.3-9: Projected Supply And Demand Comparison To 2020 (Table 54) During Multiple Dry Year Period - AFY					
	2016	2017	2018	2019	2020
Supply totals	12,826	12,889	12,952	13,017	13,082
Demand totals	12,826	12,889	12,952	13,017	13,082
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

Tables 6.3-10, 6.3-11, and 6.3-12 compare the projected water supply and demand based on low consumption rate (Scenario 1) occurring between 2021-2025 with a comparison to the average annual consumption projection (Scenario 2).

Table 6.3-10: Projected Supply During Multiple Dry Year To 2025 (Table 55) AFY					
	2021	2022	2023	2024	2025
Supply	13,156	13,222	13,290	13,358	13,427
% of projected normal	76.6%	76.5%	76.4%	76.4%	76.3%

Table 6.3-11: Projected Demand Multiple Dry Year To 2025 (Table 56) AFY					
	2021	2022	2023	2024	2025
Demand	13,156	13,222	13,290	13,358	13,427
% of projected normal	76.6%	76.5%	76.4%	76.4%	76.3%

Table 6.3-12: Projected Supply And Demand Comparison To 2025 (Table 57) During Multiple Dry Year Period - AFY					
	2021	2022	2023	2024	2025
Supply totals	13,156	13,222	13,290	13,358	13,427
Demand totals	13,156	13,222	13,290	13,358	13,427
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

6.4 Water Supply Projects

Cal Water will continue its annual main replacement program to upgrade and improve the distribution systems of the Hermosa-Redondo District. Cal Water has developed treatment facilities on its existing wells to assure reliability. Cal Water has not produced its full adjudicated right of groundwater during any of the past thirty years. Typically,

the unused rights have been in-lieu to the Water Replenishment District of Southern California (WRD) or leased to other pumpers to produce. California Water Service Company has scheduled a water supply and facilities master plan for 2008. This plan will evaluate the water system with the help of the hydraulic model currently being developed to determine its reliability to deliver future demands. The plan will provide a prioritized schedule of capital improvements necessary to meet anticipated future demands.

Future water supply projects are summarized in Table 6.4-1.

Table 6.4-1: Future Water Supply Projects (Table 17)

Project Name	Projected Start Date	Projected Completion Date
Water Supply And Facilities Master Plan	2008	2008

6.4.1 Desalinated Water

There are no plans for the development of desalinated water in Hermosa-Redondo District by California Water Service Company.

6.4.2 Seawater Barrier

Two injection barriers have been created and are being maintained by the West Basin to stop the inflow of seawater into the West Coast Basin. This project is inside of the Hermosa-Redondo District boundary, however California Water Service Company does not supply any water to this project.

7 Water Demand Management

7.1 California Urban Water Conservation Council

California Water Service Company is a CUWCC member. Annual reports are submitted to the CUWCC every two years describing BMP implementation, see Appendix G. The reports are considered complete by the CUWCC website.

7.2 Water Conservation Best Management Practices

Water conservation is a method available to reduce water demands, thereby reducing water supply needs for the Hermosa-Redondo District. This chapter presents an analysis of water conservation best management practices (BMPs) and a description of the methods and assumptions used to conduct the analysis.

The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the Department of Water Resources (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 (MOU), as amended September 16, 1999, among parties, which formalizes an agreement to implement these BMPs and makes a cooperative effort to reduce the consumption of California's water resources. Table 7.2-1 presents the BMPs as defined by the MOU. The California Urban Water Conservation Council (CUWCC) administers the MOU.

The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the water utility may request an economic exemption for that BMP. The BMPs as defined in the MOU are generally recognized as standard definitions of water conservation measures. California Water Service Company (Cal Water) is a signatory of the MOU. As a signatory of the MOU, Cal Water has agreed to implement the BMPs as defined in Exhibit 1 of the MOU that are cost beneficial and complete such implementation in accordance with the schedule assigned each BMP.

Table 7.2-1: Water Conservation BMP	
No.	BMP Name
1	Water survey programs for single family residential and multifamily 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.

7.3 Economic Analysis Methodology and Assumptions

An economic analysis was conducted for six of the 14 BMPs that are described in the MOU (i.e. BMP nos. 1, 2, 5, 6, 9, and 14). Economic analyses were not done for BMPs 3, 7, 8, 10, 11, 12, and 13 because they are essentially non-quantifiable, but essential to the success of those BMPs that are quantifiable. An economic analysis was not done for BMP 4 since this BMP has been fully implemented.

Assumptions used in the economic analysis for each BMP are attached in Appendix I. Directly beneath each assumption is a brief description of the rationale and/or supporting evidence for that assumption. Common assumptions for all BMPs are the value of conserved water ($750/ac-ft), the real discount rate (6.15%), and the overhead rate (13%). The real discount rate is calculated from the assumed real cost of money (8.82%) and the assumed long-term inflation rate (2.52%) using the precise conversion method (A&N Technical Services 2000, pg A-2). Housing information and a breakdown of the number of connections for each connection category used for the economic analysis are presented in Table 7.3-1 and 7.3-2.

Table 7.3-1: Housing Estimates and Projections		
Year	Single family dwelling units	Multi-family dwelling units
1991	20,266	15,409
1997	20,666	15,503
2000	21,105	--
2005	21,454	--
2010	21,808	--
2015	22,168	--
2020	22,534	--

Table 7.3-2: Connections by Classifications (1997)	
Classification	Connections
Single family	20,666
Multifamily	1,458
Commercial	2,206
Industrial	35
Institutional	355
Irrigation/landscaping	0
Total	24,720

The economic analysis was performed using a spreadsheet model. A separate, customized worksheet for each BMP is presented in Appendix I. Each BMP economic analysis spreadsheet projects, on an annual basis, the number of interventions and the dollar values of the benefits and costs that would result from implementing a particular BMP. Terms and formulas that are common to all the worksheets are defined in Table 7.3-3.

Table 7.3-3: Definition of Terms Used in the Economic Analysis		
Term	Definition	Comments
BENEFITS:		
Avoided Capital Costs	Capital costs that are avoided by implementing the BMP.	An example is the cost of a well that would not have to be installed due to implementation of the BMP.
Avoided Variable Costs	Variable costs that are avoided by implementing the BMP.	An example is the cost of electricity that would be saved if the BMP were implemented.
Avoided Purchase Costs	Purchase costs that are avoided by implementing the BMP.	An example is the cost of purchasing water that would not be needed due to implementation of the BMP.
Total Undiscounted Benefits	The sum of avoided capital costs, avoided variable costs and avoided purchase costs.	
Total Discounted Benefits	The present value of the sum of avoided capital costs, avoided variable costs and avoided purchase costs.	An annual percentage rate consisting of the cost of borrowing money minus the inflation rate.
COSTS:		
Capital Costs	Capital costs incurred by implementing the BMP.	For example, the cost to purchase and install meters for BMP 4.
Financial Incentives	The cost of financial incentives paid to connections.	Copay or distribution for purchasing low-flow plumbing devices or washing machines are examples of financial incentives.
Operating Expenses	Operational expenses incurred during implementation of the BMP.	
Total Undiscounted Costs	The sum of capital costs, financial incentives, and operating expenses.	
Total Discounted Costs	The present value of the sum of capital costs, financial incentives, and operating expenses.	The discount rate is used to calculate discounted costs from undiscounted costs.
NET PRESENT VALUE	Total discounted benefits minus total discounted costs.	A value greater than zero indicates an economically justifiable BMP.
RESULTS:		
Benefit / Cost Ratio	The sum of the total discounted benefits divided by the sum of the total discounted costs.	A ratio greater than one indicates an economically justifiable BMP.
Simple Pay-Back Period	The number of years required for the benefits to pay back the costs of the BMP, calculated as the sum of the total discounted costs divided by the average annual total discounted benefits.	A low value is considered economically attractive.
Discounted Cost / Water Saved	The present-value cost to save one acre-foot of water, calculated as the sum of the total discounted costs divided by the total acre-feet of water saved over the study period.	A low value is considered economically attractive because it indicates a low implementation cost. Value must be less than the marginal cost of new water to be cost effective.
Net Present Value / Water Saved	The net value of saving one acre-foot of water, calculated as the sum of the net present value divided by the total acre-feet of water saved over the study period.	A high value is considered economically attractive.

7.4 Economic Analysis Results

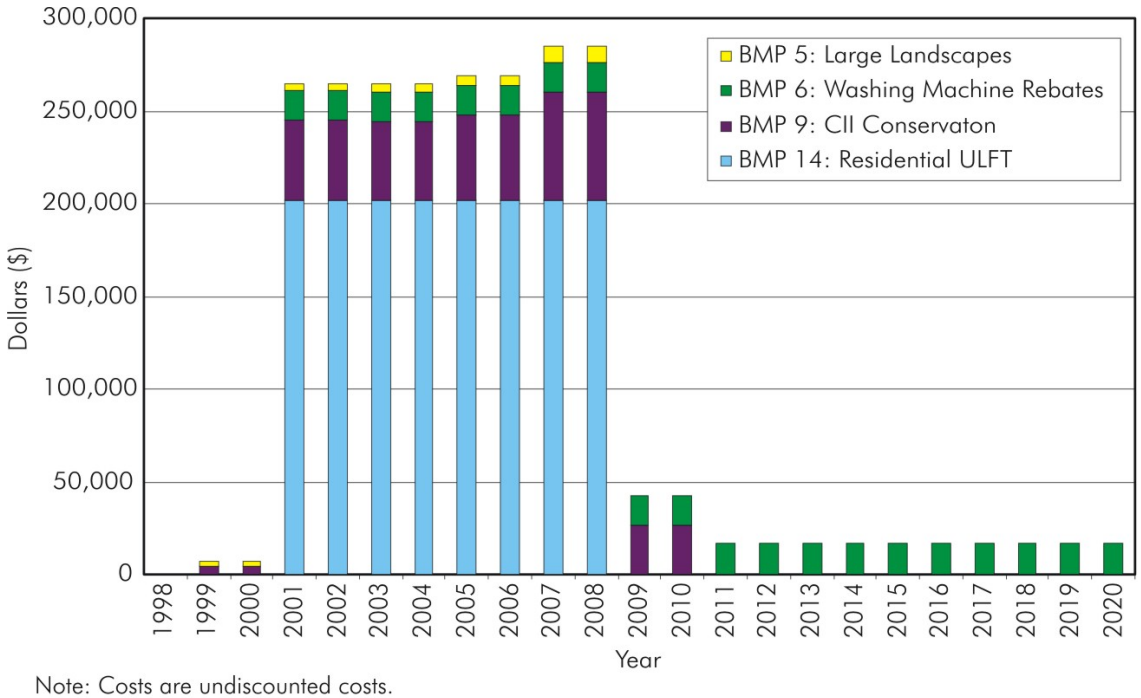
Table 7.4-1 summarizes the results of the economic analysis in terms of the benefit/cost (B/C) ratio, the simple payback period, the discounted cost per ac-ft of water saved, and the net present value (NPV) per ac-ft of water saved for each BMP.

Table 7.4-1: Results Of Economic Analysis

BMP No.	BMP Name	Total discounted cost over study period ($)	Total water saved[a] (ac-ft)	Benefit / cost ratio	Simple payback period (years)	Discounted cost / water saved ($/ac-ft)	Net present value / water saved ($/ac-ft)
1	Water survey programs for single-family residential and multi-family residential connections.	234,129	202	0.5	25	1,158	-565
2	Residential plumbing retrofits.	716,424	957	0.7	20	749	-223
5	Large landscape conservation programs and incentives.	39,577	368	5.2	3	108	451
6	High-efficiency washing machine rebate programs.	195,849	590	1.2	17	332	750
9	Conservation programs for commercial, industrial, and institutional (CII) accounts.	366,109	1,867	2.6	9	196	305
14	Residential ULFT replacement programs.	2,031,074	7,293	1.7	12	278	186
Total water saved over study period.							

Annual water costs and savings for each of the BMPs with a B/C ratio equal to or greater than one are presented graphically on Figures 7.4-1 and 7.4-2 and summarized in Table 7.4-2. Table 7.4-2 also presents the number of annual interventions required for each BMP for the water system to be in compliance with the MOU for all cost effective BMPs. Interventions and costs shown for BMPs for prior year of 1998, 1999, and 2000, if not yet completed, would have to be implemented in future years.

Figures 7.4-1 and 7.4-2 and Table 7.4-2 do not include the water savings and costs associated with BMPs 3, 7, 8, 10, 11, 12, and 13 since no specific level of effort is defined in the MOU for these BMPs. BMPs 4 and 11 are already implemented and, therefore, have no cost associated with them. BMP 13 is covered by CPUC General Order 103, and has no cost unless triggered by a water shortage condition.



Note: Costs are undiscounted costs.

Figure 7.4-1: Hermosa/Redondo BMP Implementation Costs

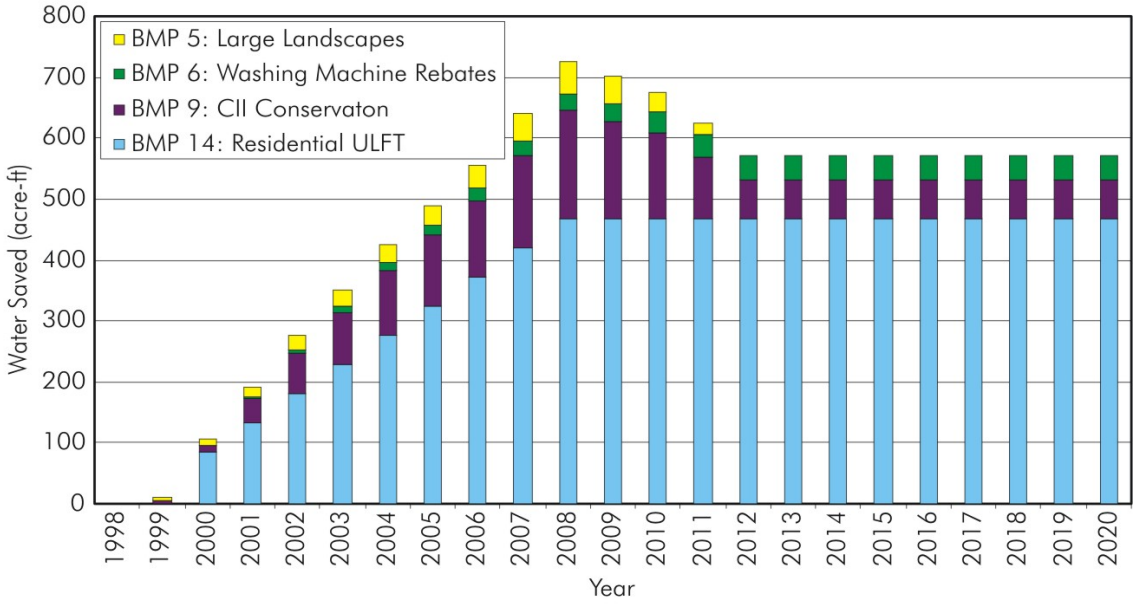


Figure 7.4-2: Hermosa/Redondo BMP Water Savings

Note: Water costs and water savings from BMPs 7, 8, 10, 11, 12, and 13 not included. See text.

Table 7.4-2: Summary Of BMP Annual Interventions, Water Saved, Cost

Year	BMP 1: Residential water surveys			BMP 2: Residential plumbing			BMP 5: Large landscapes			BMP 6: Washing machine rebates		
	Interventions	Water saved	Cost	Interventions	Water saved	Cost	Interventions	Water saved	Cost	Interventions	Water saved	Cost
		(ac-ft/yr)	($/yr)		(ac-ft/yr)	($/yr)		(ac-ft/yr)	($/yr)		(ac-ft/yr)	($/yr)
1998	B/C<1	B/C<1	B/C<1	B/C<1	B/C<1	B/C<1	0	0	0	0	0	0
1999							19	5	2,434	0	0	0
2000							19	9	2,434	0	0	0
2001							27	16	3,407	212	3	15,881
2002							27	22	3,407	212	7	15,933
2003							35	26	4,381	213	10	15,986
2004							35	29	4,381	214	13	16,038
2005							43	33	5,354	215	17	16,091
2006							43	37	5,354	215	20	16,144
2007							70	45	8,762	216	23	16,197
2008							70	53	8,762	217	27	16,250
2009							0	43	0	217	30	16,303
2010							0	33	0	218	34	16,356
2011							0	17	0	219	37	16,410
2012							0	0	0	220	40	16,464
2013							0	0	0	220	41	16,518
2014							0	0	0	221	41	16,572
2015							0	0	0	222	41	16,626
2016							0	0	0	222	41	16,681
2017							0	0	0	223	41	16,736
2018							0	0	0	224	41	16,791
2019							0	0	0	225	41	16,846
2020							0	0	0	225	42	16,901
Total	0	0	0	0	0	0	389	368	48,675	4,370	590	327,722

Note: B/C<1 indicates a benefit to cost ratio less than one.

Table 7.4-2: Summary Of BMP Annual Interventions, Water Saved, Cost (cont)

Year	BMP 9: CII conservation			BMP 14: Residential ULFT[a]			Total		
	Interventions	Water saved (ac-ft/yr)	Cost ($/yr)	Interventions	Water saved (ac-ft/yr)	Cost ($/yr)	Interventions	Water saved (ac-ft/yr)	Cost ($/yr)
1998	0	0	0	0	0	0	0	0	0
1999	31	26	21,603	0	0	0	26	10	6,934
2000	31	53	21,603	2,813	86	0	2,839	106	6,934
2001	232	79	42,457	1,600	134	201,600	2,072	191	264,245
2002	232	105	42,457	1,600	181	201,600	2,073	275	264,298
2003	237	109	46,058	1,600	229	201,600	2,080	351	264,424
2004	237	113	46,058	1,600	276	201,600	2,081	426	264,476
2005	255	140	58,660	1,600	324	201,600	2,094	490	269,102
2006	255	166	58,660	1,600	371	201,600	2,095	554	269,155
2007	208	148	26,254	1,600	419	201,600	2,141	640	285,218
2008	208	130	26,254	1,600	467	201,600	2,142	725	285,271
2009	208	97	26,254	0	467	0	426	701	42,557
2010	208	64	26,254	0	467	0	426	676	42,610
2011	0	64	0	0	467	0	219	623	16,410
2012	0	64	0	0	467	0	220	571	16,464
2013	0	64	0	0	467	0	220	571	16,518
2014	0	64	0	0	467	0	221	571	16,572
2015	0	64	0	0	467	0	222	571	16,626
2016	0	64	0	0	467	0	222	571	16,681
2017	0	64	0	0	467	0	223	571	16,736
2018	0	64	0	0	467	0	224	572	16,791
2019	0	64	0	0	467	0	225	572	16,846
2020	0	64	0	0	467	0	225	572	16,901
Total	2,343	1,867	442,573	15,613	8,086	1,612,800	22,715	10,911	2,431,769

Note: B/C<1 indicates a benefit to cost ratio less than one.
[a]BMP 14 Interventions shown prior to 2001 have been implemented.

7.5 Additional Issues

Non-economic factors, including environmental, social, health, customer impacts, and technological are not thought to be significant in deciding which BMPs to implement. No water supply projects are currently planned that would supply water at a higher unit cost. Cal Water has the legal authority to implement the BMPs. However, the costs of implementing these BMPs are subject to CPUC approval.

7.6 Previous Water Management Program Accomplishments

Cal Water has conducted conservation programs in the Hermosa-Redondo District for many years. The Company believes that managing demand is an important element in the overall management of water supply and has made efforts to promote conservation through educational, informational, and customer assistance activities.

7.6.1 External Measures to Achieve Public Support

Cal Water participates in conservation activities that have been either fully or partially funded by area wholesale water suppliers such as West Basin Municipal Water District and Metropolitan Water District of Southern California. Table 7.6-1 indicates participation in the Cal Water Hermosa-Redondo service area.

Table 7.6-1: Conservation Measure

Conservation Measure	Date Implemented	Program End Date
BMP 01 Residential Survey	2000	N/A at this time
BMP 02 Plumbing Retrofit	1991	Ongoing
BMP 06, High Efficiency Washing Machine Rebate	2001	Ongoing
BMP 07 Public Information	1988	Ongoing
BMP 08 School Programs	1990	Ongoing
BMP 14 Toilet Replacement	1992	Ongoing 3015 Replaced

7.6.2 Internal Measures to Achieve Efficient Water Management

Distribution System Water Audit and Leak Detection Program

Annually, Cal Water completes a prescreening system audit to determine the level of unaccounted for water in each system and to evaluate whether a full-scale system audit is needed. Cal Water uses a simple method to calculate unaccounted for water, subtracting total sales from total water production, and then dividing the result by the total production amount to obtain the percentage of production that is lost. Unaccounted for water in 2004 was 6.9% of demand and has averaged 7.3% over the past ten years.

Cal Water is prepared to conduct full-scale system water audits in the event that unaccounted for water is 10% or more, providing that a full-scale system audit is cost-

effective to implement. If cost-effective, a full-scale audit will be implemented using methodology consistent with that described in AWWA's Water Audit and Leak Detection Guidebook.

Water Efficient Landscape Guidelines

In 1992, water efficient landscape guidelines were developed (See Appendix F). These guidelines apply to all landscapes designed for Cal Water properties including renovations. For ease of adoption by districts with a multitude of climates and microclimates, the guidelines are generic. They do, however, adhere to water efficient landscape (Xeriscape) principles.

7.7 Overall District Goals

Cal Water recognizes the importance of conservation in managing its water resources. While economic and regulatory constraints of integrating conservation into supply management have proven challenging, Cal Water is participating in efforts to develop demand management strategies, standards, and criteria by working with the California Urban Water Conservation Council. This Council was formed as part of the MOU primarily to oversee the implementation of the BMPs and to improve water conservation practices and analyses. Cal Water is committed to this process and the development of an integrated resource plan.

Cal Water's conservation programs are intended to assist customers in their efforts to use water efficiently as well as to educate them about their water supply. This will lead them to make informed decisions concerning the efficient use of water and enable them to respond better to required reductions in water use should a water shortage or emergency occur. During periods of water shortages, the Company's conservation programs can be expanded and may include more restrictive measures such as mandatory reductions, rationing, and penalties.

7.8 Proposed Conservation Programs

Cal Water proposes to run seven conservation programs in the Hermosa-Redondo District at an annual cost of $147,106.00, Table 7.8-1. Before implementing any conservation program, Cal Water must receive approval from the CPUC.

Table 7.8-1: Proposed Annual Conservation Program Budget 2005 - 2007

PROGRAM	2005	2006	2007	TOTAL
BMP 02, Plumbing Retrofit	$7,710.00	$7,710.00	$7,710.00	$23,130.00
BMP 05, Large Landscape (ET Controller)	$34,000.00	$34,000.00	$34,000.00	$102,000.00
BMP 06, High Efficiency Washing Machine Rebate	$28,950.00	$28,950.00	$28,950.00	$86,850.00
BMP 07, Public Education	$15,995.00	$15,995.00	$15,995.00	$47,985.00
BMP 08, School Education	$11,000.00	$11,000.00	$11,000.00	$33,000.00
BMP 09, CII Conservation Programs	$16,641.00	$16,641.00	$16,641.00	$49,923.00
BMP 14, ULFT Rebate	$32,810.00	$32,810.00	$32,810.00	$98,430.00
Total per year	$147,106.00	$147,106.00	$147,106.00	$441,318.00

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Appendices