

CITY OF BEVERLY HILLS

2005

URBAN WATER MANAGEMENT PLAN



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CITY OF BEVERLY HILLS

2005

URBAN WATER MANAGEMENT PLAN

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**2005
URBAN WATER MANAGEMENT PLAN
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CHAPTER 1

INTRODUCTION

1.1 URBAN WATER MANAGEMENT PLANNING ACT

This is the Urban Water Management Plan (“2005 Plan”) for the City of Beverly Hills (“City”). This plan has been prepared in compliance with the Urban Water Management Planning Act (“Act”), which has been codified at California Water Code sections 10610 through 10657 and can be found in **Appendix B** to this 2005 Plan. The Act has been amended on several occasions since its initial passage in 1983. Most recently, in 2004 the Act was amended to require additional discussion of transfer and exchange opportunities, non-implemented demand management measures and planned water supply projects. A summary of recent amendments to the Act is included in **Appendix C**.

The Act requires “every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt, in accordance with prescribed requirements, an urban water management plan.” Urban water suppliers must file these plans with the California Department of Water Resources (DWR) every five years describing and evaluating reasonable and practical efficient water uses, reclamation, and conservation activities. (*See generally* Wat. Code § 10631.)

In preparing this 2005 Plan, the City has encouraged broad community participation. Copies of the City’s draft plan were made available for public review at City Hall and the local public library. Additionally, copies of the draft plan were mailed directly to the California State Library, and the Public Works Commission. The City noticed a public hearing to review and accept comments on the draft plan with more than two weeks in advance of the hearing. The notice of the public hearing was published in the local press and mailed to City Clerk of West Hollywood. On December 20, 2005, the City held a noticed public hearing to review and accept comments on the draft plan. Notice of the public hearing was published in the local press. Following the consideration of public comments received at the public hearing, the City adopted the 2005 Plan on December 20, 2005. A copy of the City Council resolution approving the 2005 Plan is included in **Appendix D**.

As required by the Act, the 2005 Plan is being provided by the City to the California Department of Water Resources, the California State Library, and the public within 30 days of the City’s adoption.

1.2 FORMAT OF THE PLAN

The chapters in this 2005 Plan correspond to the items presented in the Act.

Chapter 1 - Introduction

This chapter describes the planning process, the history of the development of the City's water supply system, its existing service area, the local climate, population served and the City's water distribution system.

Chapter 2 – Water Supply Resources

This chapter describes the existing water supplies available to the City, including imported water purchased from the Metropolitan Water District of Southern California ("MWD") and local groundwater extracted from the Hollywood Basin. In addition, this chapter discusses potential future water supplies, including transfers and exchanges, recycled water and desalinated water. It concludes by analyzing the impact of water quality on reliability of the City's water supplies.

Chapter 3 – Water Demands

This chapter describes past, current and projected water usage within the City's service area prior to the implementation of future demand management measures.

Chapter 4 – Reliability Planning

This chapter presents an assessment of the reliability of the City's water supplies by comparing projected water demands with expected water supplies under three different hydrologic conditions: a normal year; a single dry year; and multiple dry years. This 2005 Plan concludes that if projected imported and local supplies are developed as anticipated, no water shortages are anticipated in the City's service area during the planning period.

Chapter 5 – Water Demand Management Measures

This chapter addresses the City's plans to implement water conservation measures and the impacts that such measures will have on overall water demands. This chapter also analyzes the feasibility of demand management measures that the City does not currently plan to implement.

Chapter 6 – Water Shortage Contingency Plan

This chapter describes the City’s current conservation activities, as well as those efforts that will be utilized in the event of a water supply interruption, such as drought. The City’s water shortage contingency plan was developed in consultation and coordination with other MWD member agencies. In addition, MWD’s 2005 Water Surplus and Drought Management Plan is also described.

Appendices

The appendices contain references and specific documents such as City ordinances and resolutions that are referred to throughout this 2005 Plan.

1.3 CITY WATER SYSTEM HISTORY

The Rodeo Land and Water Company was the original developer of the Beverly Hills area, completing and recording the subdivision map in 1907. That company also formed a subsidiary known as the Beverly Hills Utilities Corporation for the purpose of providing local residents with water utility services.

The City of Beverly Hills was officially formed as a municipal government on January 28, 1914. In 1923, the City approved the acquisition of the Beverly Hills Utilities Corporation and with the advent of this acquisition and its own improvements to the water supply, the City experienced a new population expansion. This population increase, in turn, required additional water supplies to accommodate further growth and development.

On April 28, 1928, the City purchased the Sherman Water Company, which served the populace in the unincorporated West Hollywood area with groundwater extracted from the Hollywood Basin. The City’s civic leaders recognized this acquisition as a critical step towards self-sufficiency and a way to obtain the rights to extract and transport additional water from the Hollywood Basin that was not needed by the unincorporated area adjacent to Beverly Hills. Based on the historical extraction of groundwater by the Beverly Hills Utilities Corporation, the Sherman Water Company and the City itself beginning in approximately 1907, the City possesses appropriate rights in local groundwater.

Due to continued population growth, the City recognized a need for imported water to supplement local groundwater supplies and meet its customers’ water demands. Following a decision by the electorate in November 1928, the City became a charter member of the Metropolitan Water District of Southern California (“MWD”) on December 29, 1928. MWD had the responsibility for developing imported water supplies for the southern California area, which it fulfilled through diversions from the Colorado

River and obtaining a legal entitlement to water deliveries from the California State Water Project (“SWP”). The City started receiving water from MWD in the early 1940’s.

In 1976, the City Council determined that the capital cost of rehabilitating or replacing the City’s aging groundwater production and treatment facilities was not economically feasible. Therefore, in 1976 the City elected to discontinue producing water from both the Hollywood Basin and the La Brea Subarea in favor of purchasing water from MWD. However, the City retained its rights to extract groundwater from both the Hollywood Basin and the La Brea Subarea for future use by submitting annual statements to the State Water Resources Control Board pursuant to Water Code section 1005.2.

In order to avoid complete dependency on imported water supplies and the continually rising costs of those supplies, the City considered the redevelopment of its groundwater starting in the 1990s. In addition, MWD encouraged the development of local groundwater at the time through offering a subsidy for groundwater treatment costs. In 1996, the City drilled a test well and analyzed the hydrologic condition of the Hollywood Basin aquifer. The City determined that the Hollywood Basin provided a viable partial alternative to the City’s total reliance on imported supplies.

The City forged ahead and developed three new groundwater production wells. In 1999, the City Council also approved the building of a reverse osmosis treatment plant with a capacity of 3 million gallons per day. After treating the raw groundwater that the City pumps from its four wells, the finished water is then blended with imported water from MWD and circulated throughout the City’s distribution system. Today, the treatment plant supplies the City with approximately 10 percent of the City’s average annual consumption or approximately 1,500 AFY.

The City is a general law city governed by a five-member City Council. The City Council employs a City Manager to serve as executive officer for the City and professional personnel to staff the departments providing municipal services to the public. The City’s Water Division is managed under the direction of the Director of Public Works.

1.4 SERVICE AREA

The City’s original boundary contained an area of 3.09 square miles and was generally bounded on the west and north by the present City limits (with the exception of the Trousdale Estates, annexed in 1955), on the east by Oakhurst Drive, and on the south by a line located approximately one block north of Wilshire Boulevard between Oakhurst Drive and the westerly city limits. The present City limits include 5.69 square miles (equal to 3,646 acres) and are bounded by the same westerly and northerly limits including the Trousdale Estates area, by San Vicente Boulevard on the east and by Whitworth Drive on the south. The City also provides water utility services to a portion

of the City of West Hollywood that is bounded on the west by Doheny Drive, on the North by Sunset Boulevard, on the east by Flores Street and on the south by Beverly Boulevard. (See **Figure 1-1**.)

The City is principally composed of high value single and multi-family residences, a centralized business and commercial district, and no agricultural service areas. (See **Figure 1-1**.)

1.5 CLIMATE

The City has a Mediterranean climate with moderate, dry summers that reach an average temperature of as high as 83°F and cool, wet winters that can dip as low as 45°F. The average rainfall is 15 inches.

1.6 POPULATION

The current population of the City is approximately 35,564. In addition, the City serves a portion of the City of West Hollywood with a population of approximately 8,346. Thus, the total current population served by the City's water system is 43,910.¹ The City's historical population for the 10 years from 1995 through 2005 and projected population in 5-year increments through 2030 are presented in **Table 1-1**. The numbers in **Table 1-1** reflect the population of the City and that portion of the City of West Hollywood served by the City of Beverly Hills.

**Table 1-1
Population Projections**

Year	2000	2005	2010	2015	2020	2025	2030
Service Area Population	41,749	43,910	44,311	45,149	45,529	46,768	47,531

1.7 WATER SYSTEM

The City's imported water supply is delivered through two connections with MWD's Santa Monica Feeder System. Those connections are designated as Beverly Hills One (BH-1) and Beverly Hills Two (BH-2). Each connection has a maximum capacity of 40 cubic feet per second ("cfs"), which together are capable of delivering up to 46,336 AFY of water into the City's system at 80 percent operation. The City's groundwater supplies

¹ All further references to the number of customers served include the City's customers within a portion of the City of West Hollywood.

are pumped from four groundwater wells, all of which are treated at the Public Works Facility. According to page 5 of a document prepared by EarthTech, titled “City of Beverly Hills Reverse Osmosis Water Treatment Plant”, “The reverse osmosis system is designed to produce up to 1,028 gpm of product water from a feed of up to 1,318 gpm.” The Beverly Hills water distribution system is gravity-based and consists of thirteen separate pressure zones, two of which supply a portion of the City of West Hollywood. The distribution system includes the reservoirs listed in following **Table 1-2**.

**Table 1-2
Water Reservoirs**

Reservoir	Material	Capacity in Million Gallons (MG)
3A	Steel: Above ground	1.2
4A	Concrete: Above ground	2.2
4B	Steel: Above ground	1.2
5	Steel: Above ground	1.2
6	Steel: Above ground	1.2
7	Steel: Above ground	1.2
Woodland	Concrete: Above ground	2
Greystone	Concrete/steel reinforced: Underground	19.5
Sunset	Concrete: Underground	6
Coldwater	Concrete: Underground	8.5*
Total Capacity (MG)		44.2

*The capacity of Coldwater Canyon is currently 7.5 MG. This reservoir is currently under design to be reconstructed and enlarged by 2007.

FIGURE 1-1 LAND USE AND SERVICE AREA

The City's water system includes two emergency interconnections with the water system of the Los Angeles Department of Water and Power ("LADWP"). One connection is located at the City's Booster Station No. 2 and the other is located at Reservoir No. 7. The Booster Station No. 2 connection is a 24-inch pipe with a 14 cfs capacity, and the connection at Reservoir No. 7 is a 12-inch pipe with an 11 cfs maximum capacity. As a practical matter, the flow rate at the Reservoir No. 7 connection depends on the water level in a nearby LADWP reservoir. The LADWP reservoir has a 500,000-gallon capacity. If this reservoir is one-half full or more, a flow rate of up to 11 cfs can be attained. If the reservoir is less than one-half full, however, the interconnection can provide as little as 2 cfs. These emergency interconnections are established for emergency water supply for the mutual benefit of both municipalities.

The City is currently pursuing a third emergency interconnection on Zone 9 for 7.5 cfs. This interconnection would improve fire safety on a closed pressure zone.

Table 1-3 summarizes the City's groundwater production well characteristics.

Table 1-3
Production Well Characteristics

Production Well	Capacity (gpm)	Groundwater Level (feet)	Date Taken
2	500	246.1	January 15, 2005
4	600	264.1	March 9, 2005
5	550	300	March 13, 2005
6	375	290	January 30, 2005

CHAPTER 2

WATER SUPPLY RESOURCES

2.1 WATER SUPPLY

The City obtains its water supply from two sources: local groundwater extracted from the Hollywood Basin through the City's wells; and imported surface water purchased from MWD.

MWD

The City receives approximately 90% of its water supply from MWD on a continuous basis at its two (2) interconnections designated as BH-1 and BH-2. The MWD imports its water from the State Water Project and the Colorado River. The City has two connections (BH-1 and BH-2) to the MWD Santa Monica Feeder System, each having a normal operational capacity of 40 cubic feet per second (cfs) or 24,948 acre feet/year.

The City has a preferential right of 1.01% of MWD's water supply.

The MWD is a wholesale, regional water supplier that distributes imported water to its member agencies, including the City, throughout most of Southern California. MWD has two primary contracts for the importation of water to Southern California: one with the State of California for delivery of State Water Project, and one with the United States Bureau of Reclamation for delivery of Colorado River.

Groundwater

The City is currently operating four (4) groundwater wells, Nos. 2, 4, 5 and 6 that pump water from the Hollywood Basin. The City's reverse osmosis treatment plant, which has a capacity of 3 mgd, treats all of the groundwater the City's produces. The plant supplies the City with approximately ten percent (10%) of the City's average annual consumption or approximately 1,500 AFY.

2.2 HISTORIC AND PROJECTED WATER SUPPLY

Table 2-1 presents the City's historic water purchases from MWD. Water purchases ranged from 11,918 Acre-Feet in 2005 (lowest) to 14,869 Acre-Feet in 1985 (Highest). The amounts of water purchases are obtained from MWD website. The decline in water use may be due to various reasons, such as implementation of water conservation measures, climate, and increase in water rates.

**Table 2-1
Historic Water Purchases from MWD**

Year	Acre-Feet	Year	Acre-Feet	Year	Acre-Feet
1979	12,796	1988	14,506	1997	13,659
1980	13,321	1989	14,594	1998	13,139
1981	14,034	1990	14,867	1999	13,545
1982	13,798	1991	13,760	2000	14,093
1983	13,218	1992	12,216	2001	13,598
1984	14,654	1993	12,559	2002	13,598
1985	14,869	1994	13,014	2003	13,178
1986	14,578	1995	12,442	2004	12,188
1987	14,791	1996	13,368	2005	11,918

Figure 2-1 shows the City’s water purchases from MWD from 1979 to 2005

**Figure 2-1
Historic Water Purchases from MWD**

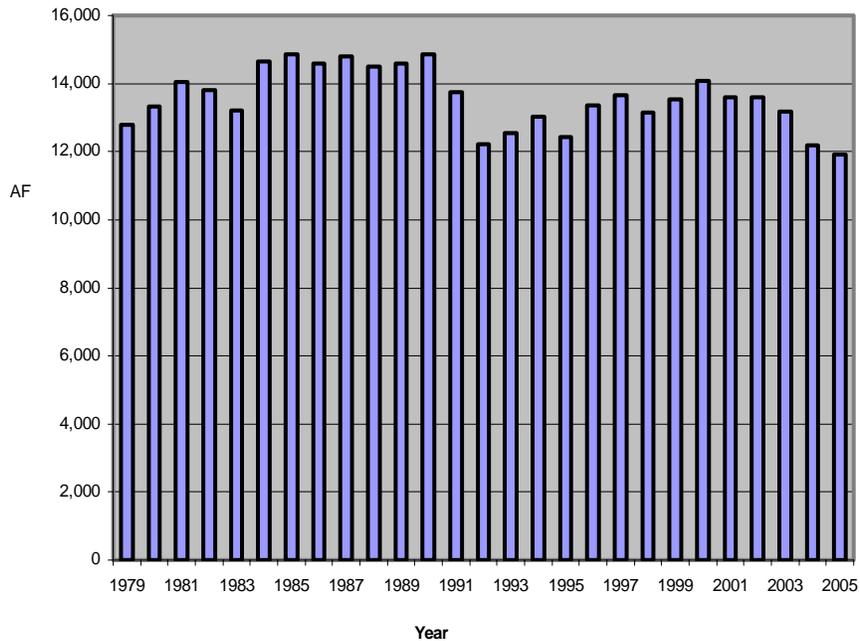


Table 2-2 shows the water supply obtained from these two sources and a breakdown of its use. Imported water makes up approximately 90% of the City’s total water supply, while local groundwater provides the remainder. The City beneficially uses approximately 88% of the total annual water supply; the City delivers the remaining 12% to the City of West Hollywood.

**Table 2-2
Water Production - 2003-2005
(Acre-feet)**

FISCAL YEAR	WATER SUPPLY			WATER SALES			UNACCOUNTED
	Local Wells	MWD	Total	Beverly Hills	West Hollywood	Total	
FY 2001-02	0	13,598	13,598	11,011	1,537	12,553	1,045
%	0%	100%	100%	81.0%	11.3%	92.3%	7.7%
FY 2002-03	405	13,178	13,583	10,865	1,535	12,400	1,183
%	3.0%	97.0 %	100%	80.0%	11.3%	91.3%	8.7%
FY 2003-04	1,854	12,188	14,042	11,234	1,586	12,820	1,222
%	13.2%	86.8%	100%	80.0%	11.3%	91.3%	8.7%
FY 2004-05	1,362	11,918	13,280	10,358	1,649	12,007	1,273
%	10.3%	89.7	100%	78.0%	12.4%	90.4%	9.6%

A. WATER SUPPLY OUTLOOK

The City consumed approximately 10,358 AF of water during FY-2004-05. In addition, the City serves a portion of the City of West Hollywood and provided approximately 1,649 Acre-Feet in FY-2004-05. “Unaccounted for” water is estimated to be 1,273 Acre-Feet. This amounts to a total consumption of 13,280 Acre-Feet of water in FY-2004-05.

B. RECYCLED WATER

All wastewater flows from the City (not including storm water) are collected by the City and delivered to the City of Los Angeles for treatment at that agency’s Hyperion Treatment Plant. The City sends approximately 6.5 mgd of wastewater to the Hyperion Plant each year.

There are no wastewater recycling plants within the vicinity of the City. The closest tertiary treatment plant is located 20 miles from the City and the closest pipeline from that plant is 15 miles from the City. At this time, no plans exist for a wastewater treatment plant due to engineering and financial issues such as discharge lines, and second infrastructure for reclaimed water. Recycled water is an additional source of water supply that may be a potential supply in future years. There is no identified land within the City that could be used to site a wastewater treatment plant, and the cost to install a dual system has been determined to be economically infeasible at the current time.

C. Desalinated Water

The City is not located adjacent to the ocean and does not have any plans for either a local or regional desalination facility at this time. The City could participate in a regional desalination facility that supplied treated water to the MWD’s distribution system, but MWD does not currently have any plans for such a facility in which the City could participate.

2.3 SUMMARY OF WATER SUPPLY

Table 2-7 shows five-year historic local groundwater production and imported water form MWD. The City started extracting water from its local groundwater since 2003. This has decreased the reliance on MWD and the amount of water purchased.

**Table 2-3
Five-Year Historic Water Purchases from MWD
And Production of Local Groundwater**

Historic					
Year	2001	2002	2003	2004	2005
MWD	13,598	13,598	13,178	12,188	11,918
Local Wells	-	-	405	1,854	1,362
Total	13,598	13,598	13,583	14,042	13,280

The City purchased 100% of its water from the MWD from 1976 to 2003. Since 2003, the City elected to pump a portion of its water, approximately 10%, from the Hollywood Basin. The amount of water extracted from local wells between 2002 and 2005 ranged from 405 AF to 1,854 AF per year.

The City had previously adopted a policy of obtaining the majority of their water from MWD. The main reason for this decision is the significant difference in the cost of rehabilitating the water supply system as opposed to MWD water. However, in the last five years, as the City became aware of the importance of not relying 100% on one

agency for its water supply, and water prices increased, the City has revised its policy and decided to use local wells as part of the water supply.

2.4 WATER QUALITY

The issue of water quality is important not only in the use of current water, but also in the development of potential water resources. Quality of the water from MWD meets the current standards and regulations. The water from MWD, at the Weymouth Plant and Jensen Plant, has an average hardness as CaCO_3 of 181 and 110 mg/l (ppm) with 90 and 81 mg/l (ppm) of alkalinity as CaCO_3 respectively. The extracted local groundwater is treated at the City's water treatment plant to meet the current standards and regulations. These treated water supplies meet or exceed the State and Federal Safe Drinking Water Act standards (See Appendix E, City of Beverly Hills' Consumer Confidence Report 2004).

2.5 PROJECTED WATER SUPPLIES

Table 2-4 shows the projected water supplies in 5-year increments.

Table 2-4
Projected Water Supplies from Local Groundwater and MWD
(acre-feet / year)

Water Supply Sources	2010	2015	2020	2025	2030
Local Wells	1,500	1,500	1,500	1,500	1,500
MWD**	13,380	13,380	13,380	13,380	13,380
Total	14,880	14,880	14,880	14,880	14,880

** MWD water supply amounts are taken from The MWD's 2005 DRAFT Regional Urban Water Management Plan, Section II, Table II-14. See Appendix F.

CHAPTER 3

WATER DEMANDS

3.1 FACTORS AFFECTING WATER DEMAND

Water use in the City depends on land use types, number of users, types of water fixtures, water loss, irrigation, and availability. Changes in demand would be affected by changes in the type and intensity of land uses, household sizes, population growth, landscaped areas, rainfall, and conservation efforts. For the City water system, water consumption projections are based on historic water production patterns in the service area. Since water purchases and production have been made according to demand, they would reflect water use.

According to the City's 2002 Water System Master Plan, "Current land use in the study area is largely residential (about 90%)... The study area will be nearly fully developed by year 2025... Additional growth will largely come from redevelopment and densification. The study area year 2005 population is about equal to the population for year 2000..."

With much of the land developed with urban uses, limited growth is expected. Land recycling for higher intensities may result in an increase in the demand for water. However, the replacement of single-family units with multi-family units will not increase water use per acre significantly.

Rainfall will continue to extend a major influence on water demand. Drought conditions will increase demand at a time when limited resources are available. Because rainfall patterns have varied according to normal patterns in the past, no special adjustment for the quantity of rainfall is factored into the projections for future demand.

The impact of any water conservation efforts that may be implemented in the future is analyzed in Chapter 4 below.

Future water consumption will continue to be met by obtaining purchases from MWD and extracting water from local wells. Additional water sources do not appear to be necessary at the current time. In order to reduce the demand on the region's valuable water resources, it is necessary to promote the conservation of water and reduce losses due to leaks and wasteful practices.

3.2 POPULATION GROWTH

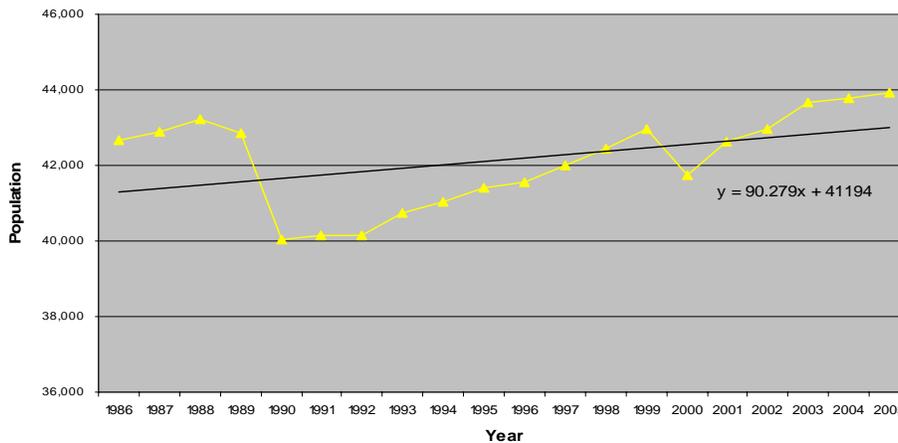
According to the City’s Water System Master Plan dated 2002, the population of West Hollywood served by the City in 2000 is approximately 8,000 people. According to Southern California Association of Governments (SCAG), the Population of West Hollywood in 2000 is 35,851 people. This indicates that the City serves approximately 22.3% of the West Hollywood population. This percentage will be used to calculate the historic and projected populations of West Hollywood served by Beverly Hills.

Table 3-1 and **Figure 3-1** illustrate the population* of the City between 1986 and 2005. Trend line is shown on **Figure 3-1**. Trend line shows that the population has increased.

Table 3-1
Current and Historic Population *

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Population	42,681	42,899	43,234	42,863	40,025	40,152	40,152	40,727	41,054	41,422
% of Population Change from Previous Year		0.5%	0.8%	-0.9%	-6.6%	0.3%	0.0%	1.4%	0.8%	0.9%
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Population	41,574	41,991	42,438	43,219	41,749	42,629	42,956	43,658	43,784	43,910
% of Population Change from Previous Year		1.0%	1.1%	1.8%	-3.4%	2.1%	0.8%	1.6%	0.3%	0.3%

Figure 3-1
Current and Historic Population *



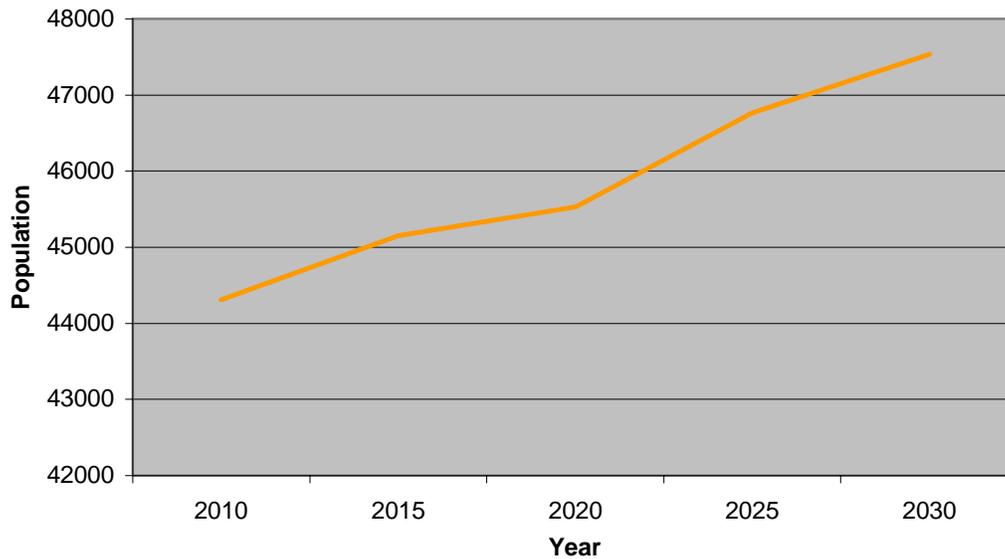
*Population data in Table 3-1 and Figure 3-1 are obtained from SCAG.

Table 3-2 and **Figure 3-2** show Beverly Hills water service population* projections. A 22.3% of the West Hollywood population is added to the Beverly Hills population to obtain the amount of population that will be serviced by the City of Beverly Hills

**Table 3-2
Projected Population***

Year	2010	2015	2020	2025	2030
West Hollywood	37,644	38,147	36,648	39,137	39,609
22.3% of West Hollywood	8,395	8,507	8,173	8,728	8,833
Beverly Hills	35,916	36,642	37,356	38,040	38,698
Total Population Served by City of Beverly Hills = Beverly Hills + 22.3% of West Hollywood	44,311	45,149	45,529	46,768	47,531

**Figure 3-2
Projected Population ***



*The population data in Table 3-2 and Figure 3-2 are obtained from SCAG.

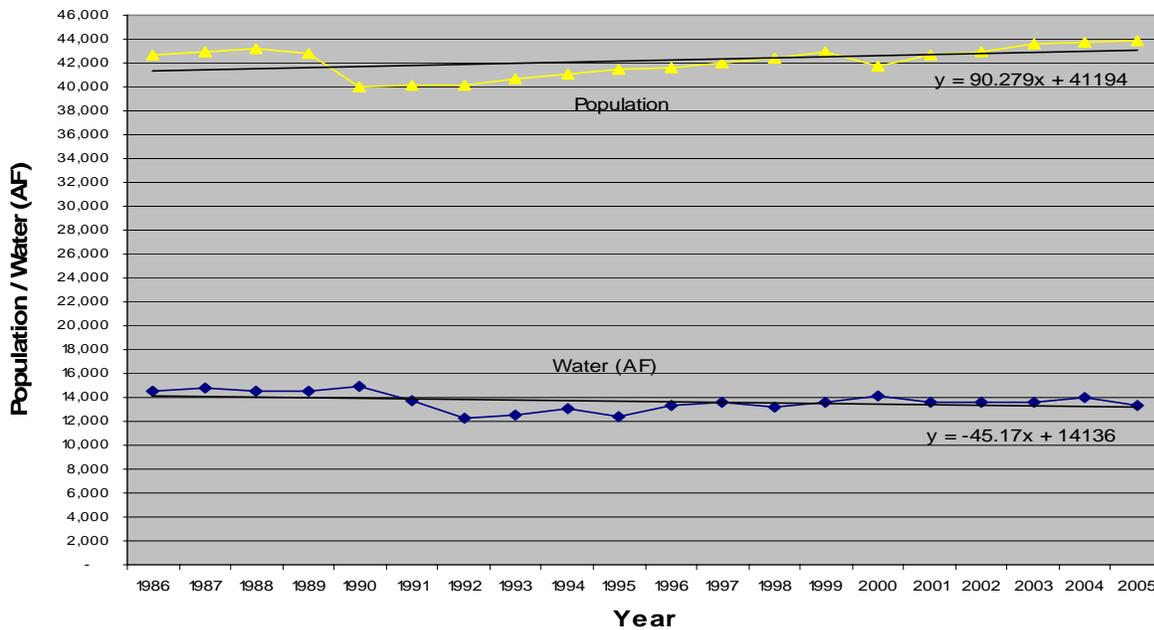
3.3 HISTORIC AND PROJECTED WATER DEMAND

In order to obtain the water demand projections for the City, the historic and projected population figures in **Tables 3-1** and **3-2**, and water consumption figures in **Tables 2-1** and **2-2** are used. **Table 3-3** and **Figure 3-3** illustrate the population* and water consumption** of the City between 1986 and 2005. Trend lines are deduced and are shown on **Figure 3-3**. Trend lines show that the water consumption has decreased and the population has increased. This indicates that water conservation has been achieved.

**Table 3-3
Historic Population and Water Consumption (AF)**

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Population	42,681	42,899	43,234	42,863	40,025	40,152	40,152	40,727	41,054	41,422
% of Population Change from Previous Year		0.5%	0.8%	-0.9%	-6.6%	0.3%	0.0%	1.4%	0.8%	0.9%
Acre-Feet	14,578	14,791	14,506	14,594	14,867	13,760	12,216	12,559	13,014	12,442
% of Water Consumption Change from Previous Year		1.5%	-1.9%	0.6%	1.9%	-7.4%	-11.2%	2.8%	3.6%	-4.4%
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Population	41,574	41,991	42,438	43,219	41,749	42,629	42,956	43,658	43,784	43,910
% of Population Change from Previous Year		1.0%	1.1%	1.8%	-3.4%	2.1%	0.8%	1.6%	0.3%	0.3%
Acre-Feet	13,368	13,659	13,139	13,545	14,093	13,598	13,598	13,583	14,042	13,280
% of Water Consumption Change from Previous Year		2.2%	-3.8%	3.1%	4.0%	-3.5%	0.0%	-0.1%	3.4%	-5.4%

**Figure 3-3
Historic Population and Water Consumption (AF)**



- * The population data in Table 3-3 and Figure 3-3 are obtained from SCAG.
- ** The water consumption data in Table 3-3 and Figure 3-3 are obtained from MWD website.

Multiple factors influence the water demand: Climate, regulations, population, system reliability, cost, etc. The following variables will be used to calculate the water demand projections:

1. Population Projections (See Table 3-2)
2. Historic use of gallons of water per capita per day (See Table 3-4)

The last 10 years represent the most current water use data during which the City has implemented conservation measures on a yearly basis. Therefore an average of the yearly water consumption and the water use per capita per day between 1996 and 2005 will be taken to determine the basis for the water demand projections. Then, other factors such as water conservation, rehabilitation of the water system and fluctuation in population will be considered to adjust the water demand projections.

Table 3-4 shows the yearly average water consumption (AF) and the average daily water consumption in gallons per capita between 1996 and 2005.

Table 3-4
Average Yearly Water Use and Gallons per Capita per Day (gpcpd) Use

Year	Population*	AF/Year	gpcpd**
1996	41,574	13,368	287
1997	41,991	13,659	291
1998	42,438	13,139	277
1999	43,219	13,545	280
2000	41,749	14,093	302
2001	42,629	13,598	285
2002	42,956	13,598	283
2003	43,658	13,583	278
2004	43,784	14,042	286
2005	43,910	13,280	270
Total	427,907	135,904	2,838
Average	42,791	13,590	284
2005	43,910	13,280	270
Average	42,791	13,590	284
Difference	1,119	(310)	(14)
Difference %	3%	-2.3%	-5%

*The population data in Table 3-4 are obtained from SCAG.

**The water data in Table 3-4 are deduced from raw data obtained from MWD.

Table 3-4 shows that the average yearly water use between 1996 and 2005 is approximately 13,590 AF.

Table 3-4 also shows that the water use in 2005 is 2.3% less than the average yearly water use (1996-2005) and the gallons of water per capita per day in 2005 is 5% less than the average gallons of water per capita per day (1996-2005). In order to maintain the integrity of the projections and allow the effect of water conservation efforts to play a role, neither the average number nor the 2005 numbers will be used; instead an amount of 275.5 gpcpd will be used. The difference between the 275.5 gpcpd and the 2005 amount of 270 will be considered as a safety factor. The safety factor is approximately 2.5%.

Table 3-5
Water Demand Projections for 2010-25 in 5 Years Increment

Year	2010	2015	2020	2025	2030
West Hollywood	37,644	38,147	36,648	39,137	39,609
% of West Hollywood	8,395	8,507	8,173	8,728	8,833
Beverly Hills	35,916	36,642	37,356	38,040	38,698
Total Population Served by City of Beverly Hills = Beverly Hills + 22.3% of West Hollywood	44,311	45,149	45,529	46,768	47,531
Average(1996-2005) Gallons per Capita Per Day	275.5	275.5	275.5	275.5	275.5
Projected Demand (AF)	13,668	13,927	14,044	14,426	14,661

Table 3-5 shows that the yearly water demand increases as the population increases. A constant amount of 275.5 gallons per capita per day is used to project the water demand. This constant number may decrease due to implementation of conservation measures in the future. The difference between the current number 275.5 gpcpd and the future number (Actual) is considered as a safety factor.

In summary, **Table 3-4** shows that the City's yearly water demand from 1986 to 2005 has fluctuated between 14,867 AF in 1990 (highest) and 12,216 in 1992 (lowest). During the drought year of 1990, the City adopted and implemented an emergency water conservation plan ordinance. This triggered the occurrence of highest yearly water use 2 years apart from the lowest.

3.4 PAST AND PROJECTED WATER USE BY CUSTOMER TYPE

The City provides water service to an area of approximately 4,010 acres – 3,642 acres within the City limits and 368 acres within the City of West Hollywood. The City is primarily a bedroom community with some industrial and commercial acreage.

Table 3-6 shows the historic water use by customer type.

Table 3-6
Historic Water Use (AF)

Sectors	2002	2003	2004	2005	Average	%
Single Family Residential	6,796	6,754	7,042	6,403	6,749	49.5%
Double Family Residential	230	225	225	214	224	1.6%
Multi-Family Residential	2,753	2,713	2,756	2,648	2,718	19.9%
Commercial	2,284	2,249	2,339	2,249	2,280	16.7%
Industrial	72	89	70	69	75	0.6%
Municipal	363	326	321	351	340	2.5%
Other	56	54	68	73	63	0.5%
Unaccounted for	1,045	1,183	1,222	1,273	1,181	8.7%
Total	13,599	13,593	14,043	13,280	13,629	100.0%

Table 3-6 shows the average historic water use percentages using data from 2002 to 2005. These percentages will be used in conjunction with demand projections from **Table 3-5** to develop the projected water use by sector.

Table 3-7
Projected Water Use by Sector (AF)

Year		2010	2015	2020	2025
Projected Demand (AF)*	%**	13,668	13,927	14,044	14,426
Single Family Residential	49.5	6766	6894	6952	7141
Double Family Residential	2	219	223	225	231
Multi-Family Residential	20	2,720	2,771	2,795	2,871
Commercial	17	2,283	2,326	2,345	2,409
Industrial	1	82	84	84	87
Municipal	3	342	348	351	361
Other	1	68	70	70	72
Unaccounted for	9	1,189	1,212	1,222	1,255
Total	100	13,668	13,927	14,044	14,426

* Projected Demand figures are obtained from Table 3-5

**Percentage of water use by sector figures are obtained from Table 3-6

The actual values of “Unaccounted for” water in **Table 3-7** may decrease in the future due to the implementation of conservation water measures. However, the same percentage is applied in this study in order to include a safety factor in the projections.

Table 3-8 shows the number of service connections by customer type.

**Table 3-8
Current Number of Service Connections**

Customer Type	2001-02	2002-03	2003-04	2004-05
Single Family Residential	7,308	7,304	7,280	6,666
Double Family Residential	502	499	501	474
Multi-Family Residential	1,504	1,539	1,529	1,426
Commercial	1,316	1,314	1,350	1,231
Industrial	91	85	85	80
Municipal	159	161	160	156
Private Fire	610	616	628	698
Municipal Fire	23	23	25	24
Other	32	32	34	36
Total	11,545	11,573	11,592	10,791

The number of service connections has dropped in the year of 2004-05.

In Fiscal Year 2004-05, the City upgraded to a new financial and billing system, which created an opportunity for the Finance Department to complete some housekeeping on the customer database. This process may be a reason for the dramatic change.

Table 3-9 shows a summary of the historical water usage factors.

Table 3-9

**Historical Water Usage Factors
For Year 2005**

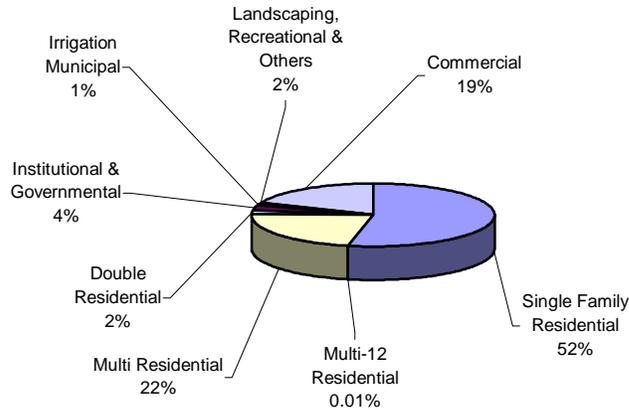
Water Usage Factors		
Urban	Water Usage (acre-feet)	Connection Usage (gallons/connection/day)
Single Family Residential	6,403	858
Multi-12 Residential	1	893
Multi Residential	2,647	1658
Double Residential	214	403
Municipal	351	2,010
Irrigation Municipal	73	1,811
Industrial	69	770
Commercial	2,249	1,632
Total	12,007	

Typically, water usage consists of residential, commercial, industrial, institutional and governmental, landscape or recreational and other purposes, which include environmental, fire fighting, line cleaning, and system losses.

Presently, the largest sector water use in the City’s service area is residential, accounting for approximately 76 percent of the total, with commercial/industrial, municipal, fire, and others making up 24 percent of the total. The City of Beverly Hills has no agricultural sector. **Figure 3-4** shows the breakdown percentages for year 2005.

**Figure 3-4
Water Usage
City of Beverly Hills Service Area**

(Year 2005)



Water demand during the early 1990's was affected by drought conditions in the Southern California region. However, the City has imposed voluntary conservation since 1977. The seven-year California drought that began in 1987 became critical in 1992 and, in response, the City initiated a tiered water rate structure, which discouraged excessive use. The tiered system along with the outreach program encouraged conservation and resulted in a reduction of 1,189 AF in the City's Yearly water consumption Between 1990 and 2004-05 despite the increase in population. Mandatory restraints were removed January of 1993, but the conservation efforts have remained, to some degree, resulting in moderate increases in water usage. However, consumption is still well below the 1990 levels. (See water use history below).

<u>Year</u>	<u>Historical use by acre-feet</u>
1960	14,071
1970	14,625
1980	13,322
1985	14,690
1990	14,469
1995	13,743
2000	13,598
2005	13,280

3.5 WATER SUPPLY AND DEMAND COMPARISON

Table 3-10 compares the current and projected water supply and demand. It indicates that in average precipitation years, the City has sufficient water to meet its customer’s needs through 2020.

**Table 3-10
Water Supply and Demand Comparison
(Acre-feet)**

Year	2010	2015	2020	2025	2030
Projected Supply (a)	14,880	14,880	14,880	14,880	14,880
Projected Demand (b)	13,668	13,927	14,044	14,426	14,661
Difference	1,212	953	836	454	219

- (a) From Table 2-4
- (b) From Table 3-5

Based on the water demand and supply projections presented in Table 3-5 the supply will meet the demand during years 2010-2030. Surplus ranges from 1,212 AF in 2010 to 219 AF in 2030.

CHAPTER 4

RELIABILITY PLANNING

The Urban Water Management Planning Act requires urban water suppliers to assess water supply reliability that compares the total projected water use with the expected water supply for a single dry water year and multiple dry water years. This chapter presents the reliability assessment for the City's service area.

4.1 RELIABILITY

Reliability is a measure of a water service systems' expected success in managing water shortages. In addition to droughts, other factors that can cause water supply shortages are earthquake, fire, floods, and water transmission and distribution interruptions.

The City received 100% of its water supply from MWD from 1976 to 2003. In 2003, the City supplemented its imported supply with local groundwater which now makes up approximately 10% of the City's total water supply.

In a report dated April 28, 2005, the status of wells 2, 4, 5, and 6 is evaluated. The report states that, "The water yield (GPM) data for each well has been reviewed. Wells 2 and 5 appear to be the best producers, with yields of 500 to 600 gpm. Well 4, located between wells 2 and 5, appears to have lower yields and a record of being off line more than the other wells, which may indicate the impacts of other wells pumping in the confined groundwater system."

City retains its rights to extract groundwater from both the Hollywood Basin and the La Brea Subarea by submitting annual statements to the State Water Resources Control Board pursuant to Water Code section 1005.2.

The City currently imports approximately 90% of its water supplies from MWD. The City has a preferential right of 1.01% of MWD water. MWD has prepared an Urban Water Management Plan and addressed the reliability of its supplies. Following are various tables addressing the reliability of the City's supplies using figures from MWD supply reliability assessment. See **Appendix F** for a copy of the MWD supply reliability assessment.

Table 4-1 presents the MWD Demand and supply capabilities for the next 25 years. This assessment included projections for single dry year, average year, and multiple dry years. The data shows that demand will be met under the three different scenarios for the next 25 years and additional water to be used as a reserve or for replenishment may be a potential supply as needed.

**Table 4-1
Firm Demand on MWD versus Supply Capability (Acre-Feet)**

	2010	2015	2020	2025	2030
Projected Multiple Dry Year Supply					
Supply	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
% of Projected Demand	110%	119%	123%	115%	109%
Projected Multiple Dry Year Demand					
Demand	2376000	2389000	2317000	2454000	2587000
% of Projected Supply	91%	84%	82%	87%	92%
Projected Multiple Dry Year Supply & Demand Comparison					
Supply	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
Demand	2376000	2389000	2317000	2454000	2587000
Difference (Supply -Demand)	243,000	445,000	524,000	373,000	240,000
Difference as % of Supply	9%	16%	18%	13%	8%

4.2 FREQUENCY AND MAGNITUDE OF SUPPLY DEFICIENCIES, (INCLUDING DROUGHT AND EMERGENCY) AND THE ABILITY TO MEET SHORT-TERM DEFICIENCIES

Supply deficiencies can be placed into two categories: those which occur on a regular basis (yearly, monthly, etc.) and those that occur during periods of drought. Historically, most California water utilities do not have water deficiencies on a regular basis. However, all utilities suffer water shortages during periods of extreme conditions such as the 1976-77 drought, and more recent drought conditions.

The city purchases 90% of its water from MWD. The remaining 10% is supplied from the local wells. In 1992, the City passed an Emergency Water Conservation Plan Ordinance that included five (5) stages. These stages extend from five percent to 50% reduction where water will be strict for health and safety requirements during a catastrophic interruption (See **Appendix G**). These stages can be implemented as needed based on the magnitude of the shortage in supply.

The City has two emergency connections with the Los Angeles Department of Water and Power (LADWP) which may be used during short term supply deficiencies.

Should groundwater contamination occur, MWD, as well as the emergency connection to the LADWP, could furnish the City's requirements until remedial measures are in place.

4.3 RELIABILITY COMPARISON

In order to determine the water supply reliability of the City’s service area – that is, a comparison of existing and projected supplies and demands – three different scenarios are evaluated: (1) normal; (2) single dry year; and (3) multiple dry years.

Table 4-2 shows a comparison between the supply and demand during Multiple Dry year for 2010, 2015, 2020, 2025, & 2030. The supply exceeds the demand in all cases.

**Table 4-2
MWD Projected Multiple Dry Year Demand and Supply**

	2010	2015	2020	2025	2030
Projected Multiple Dry Year Supply					
Supply	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
% of Projected Demand	110%	119%	123%	115%	109%
Projected Multiple Dry Year Demand					
Demand	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
% of Projected Supply	91%	84%	82%	87%	92%
Projected Multiple Dry Year Supply & Demand Comparison					
Supply	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
Demand	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
Difference (Supply minus Demand)	243,000	445,000	524,000	373,000	240,000
Difference as % of supply	9.3%	15.7%	18.4%	13.2%	8.5%

Table 4-3 shows a comparison between the supply and demand during a single-dry-year for 2010, 2015, 2020, 2025, & 2030. The supply exceeds the demand in all cases. The surplus as percentage of supply ranges from 19% to 28%. The surplus as percentage of demand ranges from 24% to 39%.

**Table 4-3
MWD Projected Single-Dry-Year Supply & Demand Comparison**

	2010	2015	2020	2025	2030
Projected Single Dry Year Water Supply					
Supply	2,842,000	3,101,000	3,102,000	3,078,000	3,078,000
% of projected Demand	124%	135%	139%	130%	124%
Projected Single Dry Year Water Demand					
Demand	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
% of Projected Supply	80.7%	74.2%	72.0%	76.8%	80.9%
Projected Single Dry Year Supply & Demand Comparison					
Supply	2,842,000	3,101,000	3,102,000	3,078,000	3,078,000
Demand	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
Difference (Supply minus Demand)	549,000	800,000	868,000	715,000	589,000
Difference as % of supply	19.3%	25.8%	28.0%	23.2%	19.1%
Difference as % of Demand	23.9%	34.8%	38.9%	30.3%	23.7%

Table 4-4 shows a comparison between the supply and demand during Average Water Year for the years of 2006 to 2030. The supply exceeds the demand in all cases. The surplus as percentage of supply ranges from 15% to 25%. The surplus as percentage of demand ranges from 18% to 33%.

**Table 4-4
MWD Projected Average Water Year Supply & Demand Comparison**

	2010	2015	2020	2025	2030
Projected Average Water Year Supply					
Supply	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
% of projected Demand	131%	127%	133%	125%	118%
Projected Average Water Year Demand					
Demand	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
% of Projected Supply	76.5%	79.0%	74.9%	79.7%	84.7%
Projected Average Water Year Supply & Demand Comparison					
Supply	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Demand	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
Difference (Supply minus Demand)	628,000	547,000	665,000	539,000	405,000
Difference as % of supply	23.5%	21.0%	25.1%	20.3%	15.3%
Difference as % of Demand	30.8%	26.6%	33.4%	25.5%	18.0%

CHAPTER 5

WATER DEMAND MANAGEMENT MEASURES

5.1 WATER DEMAND MANAGEMENT MEASURES AND BEST MANAGEMENT PRACTICES

Establishing goals and choosing water conservation measures is a continuing planning process. Goals are developed, adopted and then evaluated periodically. Implementation of specific conservation measures are phased in and then evaluated for their effectiveness, achievement of desired results, and customer satisfaction. Water conservation can achieve a number of goals such as:

- Meeting legal mandates
- Reducing average annual potable water demands
- Reducing sewer flows
- Reducing demands during peak seasons
- Improving the reliability of the system
- Meeting drought restrictions

The Act identifies 14 Water Demand Management Measures (DMMs) that correspond with the California Urban Water Conservation Council's 14 Urban Best Management Practices (BMPs).

The California Urban Water Conservation Council was created to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations, and private entities. The Council's goal is to reduce California's long-term urban water demands by integrating urban water conservation BMPs into the planning and management of California's water resources.

In 1991, nearly 100 urban water agencies and environmental groups signed an historic **Memorandum of Understanding** that pledges development and implementation of the fourteen BMPs. The BMPs are currently implemented by the signatories to the MOU on a voluntary basis. However, the CALFED Bay-Delta Program has included mandatory implementation of the BMPs and certification of water use efficiency programs in its final Environmental Impact Statement/Report and Record of Decision. This certification requirement would take effect by December 2002 and would apply to any agency subject to the Urban Water Management Planning Act that is located in the CALFED solution area.

In July 2004, The City of Beverly Hills became a member to the California Urban Water Conservation Council and, therefore, a signatory to the MOU with other signatory groups

(water suppliers, public advocacy organizations and other interested groups) regarding urban water conservation in California. While not required to implement the BMP's, local agencies have voluntarily complied with many of them, as discussed in this chapter.

5.2 IMPLEMENTATION LEVELS OF DMMs/BMPs

DMM 1: WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS

Retail agencies are required to develop a strategy for targeting and marketing water use surveys to single-family and multi-family residential customers.

The City conducted a water survey program for single-family and multi-family residential customers in 1992. The surveys identified and quantified leaks.

MWD provided approximately 6,000 water conservation kits to the City for distribution to City customers. The kits contained shower flow restrictors, and dye tablets to check for toilet leaks.

According to MWD, low-flow showerheads use 2.5 gallons of water each minute as opposed to an older model showerhead that uses 4 gallons per minute. The savings using the 6,000 shower flow restrictors will amount to approximately 9,000 gallons per minute during water use.

DMM 2: RESIDENTIAL PLUMBING RETROFIT

The City, in order to effectively address potential problems concerning existing water supplies and ever increasing wastewater flow in the sewage system, has adopted a citywide conservation program, which became effective May of 1991. The ordinance states the following:

“No building permit shall be issued for any new building unless all showerheads, water closets and urinals meet the following requirements:

1. Showerheads: All showers shall be equipped with low flow showerheads.
2. Water Closets: All water closets shall be ultra low flush, as defined in this article.
3. Urinals: All urinals shall be ultra low flow as defined in this article.”

Table 5-1 shows quantities of low flow devices that were installed by customers between 1992 and 2005 in accordance with the City Ordinance.

Approximately 50,373 low flow devices were installed by the City’s residents between 1992 and 2005. An average of 58 acre-feet of water per year was saved between 2002 and 2005.

**Table 5-1
Savings Due to Installation of Low Flow Devices**

Year	Quantity					Total
	1992-2001	2002	2003	2004	2005	
Single Family	} 37,755	2,352	2,674	2,687	2,571	48,039
Multi-Family		714	462	512	646	2,334
Total	37,755	3,066	3,136	3,199	3,217	50,373
Water Savings (Acre-foot)						
Toilets	247	9	9	9	9	283
Faucets	317	12	11	12	12	364
Showers	348	38	37	38	39	500
Total	912	59	57	59	60	1,147

- 3.5 Gallons for every toilet flush
- 1.5 Gallons per faucet for each minute it runs
- 1,800 Gallons per year per person for showers
- 1 Acre-foot = 325,851 Gallons

Calculations for savings per device:

- Assume an average of 2 people in a single family home. Assume 2 flushes per person/per day.
- Assume an average of 3 people in a multi-family home. Assume 3 minutes of faucet running per person/day.
- Assume 1,800 gallons per person per year for showers.
- Assume the low flow devices are divided equally between shower heads, toilets, and faucets.

**Table 5-2
Projected Installation of Low Flow Devices**

Year	Quantity					Total
	2006	2007	2008	2009	2010	
Single Family	2,571	2,571	2,571	2,571	2,571	12,855
Multi-Family	584	584	584	584	584	2,920
Total	3,155	3,155	3,155	3,155	3,155	15,775
Projected Water Savings (Acre-foot)						
Toilets	9	9	9	9	9	45
Faucets	12	12	12	12	12	60
Showers	38	38	38	38	38	190
Total	59	59	59	59	59	295

- Gallons for every toilet flush
- 1.5 Gallons per faucet for each minute it runs
- 1,800 Gallons per year per person for showers
- 1 Acre-foot = 325,851 Gallons

Calculations for savings per device:

- Assume an average of 2 people in a single family home. Assume 2 flushes per person/per day.
- Assume an average of 3 people in a multi-family home. Assume 3 minutes of faucet running per person/day.
- Assume 1,800 gallons per person per year for showers.
- Assume the low flow devices are divided equally between shower heads, toilets, and faucets.

It is projected that approximately 15,755 low flow devices will be installed in properties within the City between 2006 and 2010 (See **Table 5-2**). The low flow devices will include showerheads that save approximately 1,800 gallons of water per year per person, faucets that save approximately 1.5 gallons for each minute they run, and toilets that save approximately 3.5 gallons on every flush. The total water savings will approximately be an additional 59 acre-feet per year. Implementation of this measure will accumulatively amount to approximately 885 acre-feet in water savings between 2006 and 2010.

DMM 3: SYSTEM WATER AUDITS, LEAK DETECTION, AND REPAIR

Section 10631 (f) of the act requires that conservation measures currently adopted and being practiced be identified. The City has developed and implemented a broad range of both water conservation and water management programs in its service area. The City is

presently engaged in water conservation through a variety of methods and programs, including identification and corrective efforts.

Leak detection is done on an informal basis based on visual reports from meter readers, field crew personnel, and the public. The City will immediately repair any leak in the distribution system after the leak is made known to or is discovered by the City water staff.

The City implements the following methods of leak detection for system and service leaks:

System Leak Detection: The water Division responds in a timely manner to all leaks reported by the public or other departments of the City. Any suspected leaks are investigated by the Water Service Representative to determine if they are customer or City leaks. Following this investigative procedure, the customer is notified if their lines are leaking or a City work order is issued to insure timely repairs. In addition, the Meter Reader(s) are required to report all visible leaks at meters or leaks that are just beginning to surface in the streets and alleys on their route.

Service Leak Detection: The utility billing clerk will track service leaks utilizing a High/Low Exception Report generated by the billing computer system. Excessive or irregular high water consumption by a particular service address is flagged and recorded as part of the High/Low Exception Report. The utility billing clerk, with the assistance of public works field staff, investigates these addresses to determine the possibility of service leaks. The meter reader also prepares work orders for leaks detected in the field.

Valve maintenance exercising is another important aspect of the City's preventative maintenance program. The City has invested in purchasing a new truck to accommodate two (2) crew members to this valve program. It is the City's goal to exercise 3,600 valves annually at the rate of approximately 300 valves per month.

In addition, the billing computer automatically flags high meter reads and all such reads are rechecked for accuracy to determine if leaks exist on customer property. If such leaks are found and determined to be on the customer's service line, the customer is advised to correct the problem immediately. Likewise, if there is a low meter reading, the account is again flagged and a recheck is scheduled to determine if the meter is malfunctioning or the property is vacated.

A test and repair program for pressure-reducing valves was established several years ago and is maintained on a semi-annual basis. Each valve is regularly exercised, tested and pressures are reset according to the reservoir elevation. Pressure recorders, combined with high low-pressure alarm, monitor all pressure zones throughout the distribution

system to reduce or minimize the incidence of water main failures due to fluctuations of pressures.

Operational checks and repairs are presently being made to the telemetry system, which monitors the reservoir water levels to prevent accidental overflows. Those reservoirs, whose telemetry systems are found to be malfunctioning, are physically checked four times daily until such time as the necessary repairs to the telemetry systems can be completed.

In December of 1998, the City upgraded the telemetry system to a fully computerized SCADA System (Supervised Control and Data Acquisition System). Besides data collection, the SCADA systems include security alarms for all reservoirs and other remote sites. A stand-alone video surveillance system has also been incorporated into the total security system. Currently, the City is in the process of upgrading the SCADA system.

The City's entire water system is metered. In 1995, the City was in the fourth year of a fourteen year meter replacement program that was designed to replace all meters 3" and smaller to maintain meter accuracy. (4", 5" and 6" meters have been replaced). However, the City decided to expedite the installation and replaced all meters 3" and smaller at one time.

In an effort to upgrade its distribution system and control leaks, the City of Beverly Hills has had an aggressive water meter and water main replacement program in place since 2000 in addition to other water related projects.

Table 5-3 presents a list of water projects and related expenditures. The City's capital improvement program, between 2000 and 2004, included an expenditure of \$6,408,906 for Water Main-Hydrant replacement, \$649,064 in miscellaneous annual maintenance, and \$256,556 for water meter replacement.

The City will continue to implement the Capital Improvement Program for the next 5 years.

**Table 5-3
Water Related Projects 2003-2004**

Year	2000	2001	2002	2003	2004
Project Type	Cost \$				
Standby Engine	\$ 5,237				
Water Main-Hydrant Repl.	\$2,826,619	\$ 2,120,454	\$ 969,431	\$ 344,896	\$ 147,506
Telemetry	\$ 21,957		\$ 4,900	\$ 121,549	\$ 8,181
Coldwater Canyon Reservoir	\$ 42,929	\$ 34,854	\$ 82,196	\$ 673,189	\$ 2,824,814
Production Well	\$ 900,107	\$ 459,547	\$ 1,737,905	\$ 298,049	\$ 3,972
Annual Maintenance	\$ 99,387	\$ 70,548	\$ 175,000	\$ 175,000	\$ 129,129
Water Meter Replacement	\$ 46,696	\$ 50,027	\$ 96,095	\$ 17,260	\$ 46,479
Water Treatment Plant	\$ 215,105	\$ 459,383	\$ 524,455	\$2,252,150	\$ 151,761
Replace Reservoir FE	\$ 154,675	\$ 183,842		\$ 342,401	\$ 96,325
Water System Master		\$ 494,517	\$ 61,472	\$ 89,437	
	\$4,812,712	\$ 3,873,172	\$ 3,651,454	\$4,313,931	\$ 3,408,167

Table 5-4 presents the water consumption data between FY2000-01 and FY2004-05.

**Table 5-4
Water Consumption FY2000-01 to FY2004-05**

Year	Water Supply			Water Sales			Unaccounted
	Local Wells	MWD	Total	Beverly Hills	West Hollywood	Total	
FY 2000-01	0	13,597	13,597	NA	NA	NA	NA
FY 2001-02	0	13,598	13,598	11,016	1,537	12,553	1,044.50
FY 2002-03	405	13,178	13,583	10,865	1,535	12,400	1,183
FY 2003-04	1,854	12,188	14,042	11,234	1,586	12,820	1,222
FY 2004-05	1,362	11,918	13,280	10,358	1,649	12,007	1,273

DMM 4: METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

Water agencies are required to place water meters on all new service connections per California state law. The DMM also requires retrofitting of existing unmetered connections, and charging a commodity rate for water. The City has incorporated this DMM into their operations and maintenance procedures.

Meters have been installed on all the City's water services and landscape connections. Records of water use by user type are kept and summarized annually.

The City has replaced a large portion of its meters throughout the City and expenditure has reached an amount of \$166,557 between 2000 and 2004 for the water meter replacement program.

DMM 5: LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

The DMM requires agencies to contact non-residential customers with large landscape areas and offer water use surveys. For those customers with dedicated irrigation meters, agencies must assign ET-based water use budgets.

In 1993, the City passed a landscape efficiency ordinance that modified the irrigation water use. In addition, literature provided by MWD is available, on request, for California Friendly (drought resistant plantings). The Public Works Facility is presently using drought resistant plantings.

In 2003, Protector Del Agua courses were provided to residents and gardeners. The City's park maintenance staff and six private gardening maintenance companies, serving the City, attended this course. The class is a six week course that includes a review of plant materials, appropriate watering, and low flow irrigation devices to achieve water efficiency and apply water conservation measures.

In 2004, the City distributed 4,000 18-months calendars that had environmental themes including water use efficiency. These calendars were distributed to Beverly Hills Unified School District students and to the public at community events.

The City has adopted the Efficient Landscaping Ordinance pursuant to the Water Conservation Act. The City modified the Landscape ordinance model prepared by the California Department of Water Resources in order to address the unique characteristics of the City. The ordinance specifies that the landscape, irrigation and drainage plans be certified by a Landscape Architect or a State Certified Landscape irrigation Auditor and must address the following criteria:

1. Plant materials are to be grouped according to water needs.
2. Erosion and runoff control are addressed.
3. Irrigation system design is based on water efficiency

If the above criteria are met, then the Director of Building and Safety shall issue a Water Efficient Landscape permit to the applicant. This ordinance is not currently implemented. The City is planning on implementing this ordinance in the next five years. (See **Appendix H**).

In addition, the Parks Division is installing computerized radio-controlled irrigation systems in conjunction with drought-resistant planting to reduce water consumption.

The City is beginning to develop more sustainable practices throughout its operation. During the participation of the update of the Urban Water Management Plan, the City's Public Works Commission requested that the City develop a water conservation strategic plan that includes how the City educates consumers and requests consumer accountability. In pursuit of achieving an inter-departmental approach to conserving water, an internal Environmental Sustainability Task Force is meeting to plan a workshop to educate community leaders and staff on different topics that can assist the City when making decisions in the future regarding natural resource consumption. The first topic to be addressed will be landscaping – irrigation, plant materials, hardscape, urban forest, etc.

DMM 6: HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS

This DMM encourages agencies to offer customer rebates for the purchase of high-efficiency clothes washers, if local energy providers or wastewater utilities also offer rebates. Efficient dishwashers reduce the amount of water required per load. Efficient washing machine use 9.5 to 12.0 gallons per load. A non-conserving washing machine uses about 14 gallons per load. The Metropolitan Water District offers a rebate program for the City to help purchase high-efficiency washing machines.

The City has distributed 30 washer rebates between November 2004 and August 2005 for an approximate amount of \$3,400.

DMM 7: PUBLIC INFORMATION PROGRAMS

The City participates in public information programs sponsored by MWD and the California Department of Water Resources. The City is also independently active in creating public awareness programs to drought conditions and the need to continue to conserve water.

The City prepares a Consumer Confidence Report (CCR) annually. (See **Appendix E**). The City uses this report as an opportunity to include information regarding ways to conserve water, and information on residential water use efficient appliance rebate program.

In an effort to encourage water conservation and raise public awareness, the City provides the following:

1. Water bills are designed to indicate the prior year historical month, current water usage and daily average use.
2. Distribution of water conservation guides, kits, and devices to gardeners, restaurants, and City offices.
3. Installation of water “Customer service line” not only to gather input concerning conservation but to report leaks and other water problems.
4. Distribution of outreach brochures to all customers in the service area discouraging irrigation runoff as required under the National Pollution Discharge Elimination System.
5. Utilization of the Environmental Inspector to monitor and advise citizens about conservation and irrigation runoff control.
6. Distribution of conservation kits, and conservation literature.

In addition, the Water Utility Staff participates in three community events and one program each year:

1. Earth Day: During this event, the City encourages visitors to become Partners in Environmental Protection. Displays are provided to educate the public about water conservation, recycling, and waste management. Vendors provide environmentally friendly products at this event to the public.
2. Design & Garden Show: This show offers gardens designed by landscape architects to be water and fire wise.
3. Safety Expo: During this event, the City educates the public about emergency preparedness and safety. The City provides visual information through displays on various safety issues, including earthquake, flooding, and public safety. Vendors provide safety products to the public at this event.

The City has a Used Oil and Filter Program designed to encourage the residents to recycle their used motor oil and oil filters. This will minimize illegal dumping and reduce the infiltration of hazardous material to groundwater.

DMM 8: SCHOOL EDUCATION PROGRAMS

MWD and the City have provided the Public Schools with the MWD Water Conservation and Quality Curriculum. The goals of the school and community education programs are to familiarize children and adult consumers with the critical importance of water within our everyday lives, while providing them with information on how to efficiently manage individual water consumption.

In 1994, the Metropolitan Water District offered a supplemental education program for students in K through sixth grade called the “Water Hunt Program.” Its purpose was to educate young children about conservation, detecting leaky toilets and the use of low flow showerheads. The City co-sponsored this program.

DMM 9: CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL (CII) ACCOUNTS

This DMM calls for identification of all commercial, industrial, and institutional accounts and ranking them according to water use. All CII accounts are to be contacted on a regular basis and offered either a) a water-use survey and customer incentives program, or b) agencies may attempt to achieve a water use reduction target in the entire CII customer sector.

The City will determine the cost effectiveness of conducting audits and offering incentives, and conducting five-year follow-up audits.

The City’s Building and Safety Department implements state flush volume standards for water closets and urinals installed in new commercial, industrial, and institutional buildings. Building permits require the use of the following low-consumption fixtures:

Toilets	1.6 gpf maximum
Urinals	1.6 gpf maximum
Showerheads	2.7 gpm maximum

The City of Beverly Hills, jointly with MWD, adopted a commercial rebate program since early 1990. Rebate flyers and applications are distributed to residents to encourage the use of high efficiency clothes washers, low flush toilets, and other water efficient devices. The rebate flyers include:

1. Replacing high flush-volume, pre-1992 toilets with new, water-efficient 1.6 gallon-per-flush toilets. 46 rebates were distributed with a value of \$60 each.
2. Use of high-efficiency clothes washers that have a water factor of 6.0 or below. Rebate amount \$110.
3. Use of dual-flush toilets that can save an average of 2,250 gallons a year. Rebate amount \$80.

Over the past five years, the City's commercial and institutions have participated in MWD's Save a Buck rebate program as follows:

- Years 2000-2004: 11 conductivity controllers, 14 high efficiency washers, 88 water brooms, and 161 Rinse and Save.
- Year 2005: 330 low flush toilets (all one large hotel), five high efficiency washers, and 5 Rinse and Save.

The lifetime savings for all devices are approximately 333 AF. The savings do not include Rinse and Save tools.

DMM 10: WHOLESALE AGENCY PROGRAMS

MWD provides extensive assistance to retail water agencies to implement water use efficiency programs. This includes: 1) implementation of regional programs on behalf of member retail water agencies, and 2) technical assistance regarding local program design and implementation, benefit/cost analysis, conservation base rate structures, and program marketing.

The City makes available, upon request, brochures and literature provided by MWD on drip irrigation, lawn watering demand and watering techniques. The City presently has Environmental Inspectors who advise service area residences regarding irrigation runoff and over watering. The Efficient Landscaping Ordinance requires plant material to be grouped according to water needs, erosion and runoff control and irrigation efficiency. In addition, **Appendix I** includes the 2005 MWD's 2005 Draft Regional Urban Water Management Plan, Section III-Implementing the Plan. This appendix shows a detailed description of the Conservation Programs implemented by MWD.

DMM 11: CONSERVATION PRICING

The City contracted with Raftelis Financial Consulting to conduct a water rate study that was completed in April of 2005 and implemented in July 9, 2005. The water rate study maintained meter charges as a bi-monthly flat charge and reallocated the tiered rate structure by customer type and added a fourth tier that served as a penalty rate for the top 20% of the City's water consumption. **Table 5-5** illustrates the rate structure that became effective July 9, 2005. As this Urban Water Management Plan is being adopted, the City is proposing a rate increase of 8% that would become effective January 2006, and 12% that would become effective July 2006. **Table 5-6** illustrates the proposed rate increase.

Table 5-5

Existing Water Rate Structures			
	SFR & Duplexes	MFR (per units in facility)	Inside City
Tier 1	up to 10 ccf	4 ccf	\$ 1.96
Tier 2	up to 55 ccf	9 ccf	\$ 2.13
Tier 3	up to 120 ccf	16 ccf	\$ 2.83
Tier 4	over 120 ccf	over 16 ccf	\$ 4.65
Non Residential Rate*			\$ 2.62
SFR: Single Family Residential ccf: 100 cubic feet MFR: Multi Family Residential			

Table 5-6

Proposed Water Rate Structures						
	SFR & Duplexes	MFR (per units in facility)	Inside City, Effective		Outside City, Effective	
			January 2006	July 2006	January 2006	July 2006
Tier 1	up to 10 ccf	4 ccf	\$ 1.99	\$ 2.15	\$ 2.49	\$ 2.69
Tier 2	up to 55 ccf	9 ccf	\$ 2.23	\$ 2.52	\$ 2.79	\$ 3.15
Tier 3	up to 120 ccf	16 ccf	\$ 3.05	\$ 3.45	\$ 3.81	\$ 4.31
Tier 4	over 120 ccf	over 16 ccf	\$ 5.15	\$ 5.89	\$ 6.44	\$ 7.36
Non Residential Rate*			\$ 2.85	\$ 3.22	\$ 3.56	\$ 4.03
SFR: Single Family Residential ccf: 100 cubic feet MFR: Multi Family Residential						

DMM 12: WATER CONSERVATION COORDINATOR

The City does not have a water conservation coordinator. However, through its staff, operators, and inspectors, the City maintains its water conservation program and implements the Demand Management Measures.

DMM 13: WATER WASTE PROHIBITION

In 1992, the City adopted Ordinance No.92-02139 (**See Appendix G**) that prohibited water waste. The Ordinance calls for water conservation stages during drought times, which included reduction in potable water use for restaurants, public restrooms, landscape irrigation, refilling of swimming pools, operation of water fountains, exterior wash of buildings and vehicles.

The ordinance also addresses the excessive use of water penalties which may include fines, and termination of water supply.

DMM 14: RESIDENTIAL ULTRA-LOW-FLOW TOILET REPLACEMENT PROGRAM

The City with the Metropolitan Water District assistance assisted in the installation of residential ultra-low-flow toilets. MWD has provided approximately 6000 water conservation kits to the City for distribution to City customers. The kits contain dye tablets to check for toilet leaks. This work has been completed prior to 2000.

The City has distributed 39 low flow toilet rebates for an amount of \$2,340 between November 2004 and August 2005.

5.3 SUMMARY

In summary, the current types of conservation and monitoring measures being practiced by the City include the following:

1. One hundred percent of all residential, commercial, industrial and municipal users are metered.
2. All source supplies of water into the City are metered.
3. Identification of use records by user type, i.e., residential, industrial, commercial and governmental.
4. Implementation of leak detection program.
5. Implementation of a valve maintenance program.

6. Continual monitoring of the operation system.
7. Implementation of a meter change out program.
8. Use of a tiered rate structure to encourage conservation.
9. Verification of all high meter reads.
10. Implementation of a maintenance program for all pressure regulation valves.
11. Implementation of computerized, radio controlled irrigation program for City Parks.
12. Adoption of Mandatory Water Conservation Program.
13. Implementation of Public Information Program.

Table 5-7 provides an overview of the City’s progress in the implementation of the DMM’s.

**Table 5-7
Water Demand Management Measures**

DMM	Description	Implementation	Implementation Schedule
1	Residential Water Survey Programs	Yes	Completed
2	Residential Plumbing Retrofit	Yes	Completed
3	System Water Audits, Leak Detection, and Repair	Yes	On-going
4	Metering with Commodity Rates	Yes	On-going
5	Landscape Conservation Programs and Incentives	Yes	On-going
6	High-Efficiency Washing Machine Rebate Programs	Yes	On-going
7	Public Information Programs	Yes	On-going
8	School Education Programs	Yes	On-going
9	Commercial, Industrial, and Institutional Conservation Programs	Yes	On-going
10	Wholesale Agency Programs	Yes	On-going
11	Conservation Pricing	Yes	On-going
12	Water Conservation Coordinator	Yes*	On-going
13	Water Waste Prohibition	Yes	On-going
14	Residential ULFT Replacement Programs	Yes	On-going

*The City does not have a specific person for water conservation coordination. However, through its staff, operators, and inspectors, the City maintains its water conservation program and implements the Demand Management Measures.

CHAPTER 6

WATER SHORTAGE CONTINGENCY PLAN

This Water Shortage Contingency Plan has been prepared in accordance with the guidelines established by the Department of Water Resources and incorporates by reference portions of the 2005 Draft Regional Urban Water Management Plan prepared by the Metropolitan Water District of Southern California, Section II-Planning for the future.

In 1992, the City passed an Emergency Water Conservation Plan Ordinance, and in 1993, the City passed a landscape efficiency ordinance.

The Emergency Water Conservation Plan Ordinance established authority for the City Manager to declare that a water shortage exists and to implement the applicable stages of conservation. Those stages are:

1. Stage “A” - a five percent reduction in water use
2. Stage “B” - a ten percent reduction in water use
3. Stage “C” - a twenty percent reduction in water use
4. Stage “D” - a thirty percent reduction in water use
5. Stage “E” – a fifty percent reduction during a catastrophic interruption. Water to be used strictly for health and safety requirements.

During the September 29, 2005, Joint Public Works Commission and Groundwater Technical Committee a member of the community requested that the Urban Water Management Plan address how the City will contact its customers in case of an emergency or severe shortage. In case of an emergency, the City will adhere to the notification procedures prescribed by the State Department of Health Services. These notifications include but are not limited to media releases, mailings, postings, and public service announcements. In addition, the City has to access to a computerized telephone call out system to every phone number with in the City’s boundaries. Regarding drought situations, the City has available the various community media, the bill message, mailings and the computerized telephone call out system. The City’s outreach would be dependent upon the severity of the shortage of water supply.

Table-4-4 shows MWD minimum supply to be 102% of the total demand during multiple-dry-year for the years of 2006, 2007, & 2008. The multiple-dry-year data are a repeat of the 1990-1992 hydrology.

6.1 COORDINATED PLANNING

Water supplies may be interrupted or reduced significantly in a number of ways including drought and earthquake, which damages water delivery or storage facilities. The ability to manage water supplies in times of drought or other emergencies is an important part of water resource management in a community. The City has two connections to the Los Angeles Department of Water and Power to supply water during emergencies.

6.2 ORDINANCE AND RESOLUTION TO ADOPT AN INTERIM WATER CONSERVATION MEASURES PROGRAM

The City passed an Emergency Water Conservation Plan Ordinance in 1992 and in 1993, the City passed a landscape efficiency ordinance.

The Emergency Water Conservation Plan Ordinance includes the following 5 stages:

1. Stage “A” - A five percent reduction
Stage “A” compliance shall consist of voluntary implementation of conservation elements including reduced irrigation, no washdown of paved areas except to alleviate immediate fire or sanitation hazards, notification of hotel and restaurant patrons of water conservation goals and serving of water at restaurants only upon request.
2. Stage “B” - A ten percent reduction
Restaurants shall serve water only upon request. All public restrooms in the City and private bathrooms in hotels shall notify patrons and employees of water conservation goals, plumbing and irrigation leaks shall be repaired as soon as possible, water use shall be reduced to ninety percent of the baseline year amount. A water penalty surcharge of up to two times the basic water rate may be charged for water usage in excess of ninety percent of baseline amount. Violation of stage “B” requirements may constitute an infraction and, upon conviction, shall be punishable by a fine not to exceed one hundred dollars.
3. Stage “C” - A twenty percent reduction
Stage “C” elements of compliance include those elements listed in Stage “B” except water usage shall be reduced to eighty percent of the baseline amount. A water surcharge of up to three times the basic water rate may be charged for water in excess of eighty percent. Violation of Stage “C” requirements may constitute a misdemeanor and, upon conviction, a fine not to exceed \$500 will be imposed.

4. Stage “D” - A thirty percent reduction

Stage “D” elements of compliance includes those elements listed on Stage “B” plus landscape irrigation may be restricted to selected days and times, refilling of spas, pools or ponds shall be prohibited, operation of fountains shall be prohibited and the exterior washdown of buildings or vehicles shall be prohibited. Water usage may be reduced to seventy percent of the baseline amount.

A water surcharge of up to four times the basic water rate may be charged for water usage in excess of seventy percent of the baseline amount.

Violation of the Stage “D” requirements may constitute a misdemeanor and, upon conviction shall be punishable by a fine not to exceed one thousand dollars. Continued excessive use may result in the termination of water service or restriction of water through domestic meters.

5. Stage “E” - A 50% Reduction During Catastrophic Interruption. Water to be Used Strictly for Health and Safety Requirements.

State “E” elements of compliance include the City Manager giving first priority to health and safety needs of water utility customers. Subsequent water uses are prioritized to provide water supply first to maintain and expand commerce within the City, next to enhance the aesthetics of the environment, and lastly to facilitate construction activities. Violation of Stage “E” shall constitute a misdemeanor and, upon conviction, shall be punishable by a fine not to exceed one thousand dollars and six months in jail.

In addition, the City developed the Efficient Landscaping Ordinance that was adopted pursuant to the Water Conservation Act. The City modified the Landscape ordinance model prepared by the California Department of Water Resources in order to address the unique characteristics of the City. The ordinance specifies that the landscape, irrigation and drainage plans be certified by a Landscape Architect or a State Certified Landscape irrigation Auditor and must address the following criteria:

1. Plant materials are to be grouped according to water needs.
2. Erosion and runoff control are addressed.
3. Irrigation system design is based on water efficiency

If the above criteria are met, then the Director of Building and Safety shall issue a Water Efficient Landscape permit to the applicant. This ordinance

is not currently implemented. The City is planning on implementing the ordinance in the next five years. **(Appendix H).**

6.3 SUPPLY SHORTAGE TRIGGERING LEVELS

The City has a legal responsibility to provide for the health and safety of the community. In order to minimize the social and economic impact of water shortages, the City will manage water supplies prudently. This Plan is designed to provide a minimum of 50 percent of normal supply during a severe or extended water shortage.

The rationing program triggering levels in **Table 6-1** describes the water supply triggering levels.

Table 6-1
Water Supply Triggering Levels

Conservation Measures	Estimate Percent Shortage
Moderate	Voluntary – Up to 5 Percent to 10 Percent Supply Reduction
Intermediate	Mandatory – 11 Percent to 20 Percent Supply Reduction
Intense	Mandatory – Greater than 20 Percent Supply Reduction

6.4 PROPOSED CONSERVATION MEASURES

While groundwater and MWD will continue to be the major suppliers of water for the City, the availability of water resources in the region is not assured. In order to reduce future demand for water supplies from MWD, the City intends to continue promoting water conservation measures. In order to reduce the amount of water use in the Beverly Hills service area, the following actions will continue to be implemented:

Voluntary Conservation

The City will continue informing the public using the MWD and the City’s website, and flyers and information attached to the water bills. By giving advice on methods of saving

water, the Department hopes to continue water conservation in the area. The Program concentrates on public awareness and education and use of water conservation kits.

The two major areas of demand reduction are in unaccounted-for water and City governmental uses. These reflect the success of the water main replacement portion of the City's Capital Improvement Program and metering of all governmental water services.

Intermediate Conservation

Implementation of major water conservation programs such as wastewater reclamation is not practical in Beverly Hills. The City does not treat its own wastewater and growth is limited. Of all the alternative conservation measures reviewed, it is reasonable for the City to continue implementing ordinances requiring ultra-low-flow toilets and low-water-use landscaping in new developments. The Water Department regularly checks the accuracy of all water meters to ensure that they are functioning properly.

Mandatory Conservation

Mandatory conservation may be imposed by implementing stages B to E of the Emergency Water Conservation Plan Ordinance depending on the triggering levels and the amount of shortages in the water supply.

The mandatory conservation program also includes regulatory measures designed to decrease water use. By requiring all new construction to install low flush toilets, low flow showerheads, and faucet aerators, the City will ensure water consumption will have a minimum cost to the user.

The City has conducted a water rate study in May of 2005. An increase in the water rate for higher water consumption was established. The increase in water rate may encourage customers to apply the water conservation measures at a greater level.

6.5 WATER SHORTAGE CONTINGENCY RESOLUTION

The City adopted Council Ordinances and Resolution establishing interim water conservation measures and penalties due to drought related unavailability of water deliveries. In addition, since the City receives approximately 90% of its water from MWD, the MWD's 2005 Water Surplus and Drought Management Plan (WSDM Plan) will be used as a supplement guide to achieve the reliability goals of Southern California's Integrated Resources Plan (IRP).

6.6 EXCESSIVE USE PENALTIES

Excessive water use penalties were established within the Emergency Water Conservation Plan Ordinance adopted in 1992 by the City. The penalties may include the following:

- A water penalty surcharge of up to two times the basic water rate may be charged for water usage in excess of ninety percent of baseline amount. Violation of stage “B” or 10% reduction requirements may constitute an infraction and, upon conviction, shall be punishable by a fine not to exceed one hundred dollars.
- A water surcharge of up to three times the basic water rate may be charged for water in excess of eighty percent. Violation of Stage “C” requirements may constitute a misdemeanor and, upon conviction, a fine not to exceed \$500 will be imposed.
- A water surcharge of up to four times the basic water rate may be charged for water usage in excess of seventy percent of the baseline amount.
- Violation of the Stage “D” or 30% reduction requirements may constitute a misdemeanor and, upon conviction shall be punishable by a fine not to exceed one thousand dollars. Continued excessive use may result in the termination of water service or restriction of water through domestic meters.
- Violation of Stage “E” or 50% reduction shall constitute a misdemeanor and, upon conviction, shall be punishable by a fine not to exceed one thousand dollars and six months in jail.

6.7 MECHANISM FOR DETERMINING ACTUAL REDUCTIONS

The City bills their customers on a bi-monthly basis. The prior year’s consumption is included on the customer bills. This allows comparison of the total consumption from each billing period to the same billing period from the prior year.

6.8 MWD’S WATER SURPLUS AND DROUGHT MANAGEMENT PLAN (WSDM)

The WSDM plan provides policy guidance for management of regional water supplies to achieve the reliability goals of Southern California’s Integrated Resources Plan (IRP). It identifies the expected sequence of resource management actions that Metropolitan will execute during surpluses and shortages to minimize the probability of severe shortages and eliminate the possibility of extreme shortages and shortage allocations. Unlike

Metropolitan's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational actions with respect to both conditions.

Through effective management of its water supply, Metropolitan fully expects to be 100 percent reliable in meeting all non-discounted non-interruptible demands throughout the next twenty five years. The benefits of Metropolitan's contingency planning approach have been evident in recent years. Of particular note are the region's successes in dealing with operational constraints such as the rehabilitation of the Colorado River Aqueduct in 2003, the disruption to Delta diversions caused by the Jones Tract flooding in 2004, and the strong position of local storage despite five years of dry conditions. Metropolitan and its member agencies jointly developed the WSDM Plan during 1998 and 1999.

6.9 2005 WSDM'S SURPLUS AND SHORTAGE STAGES

The WSDM Plan distinguishes between Surpluses, Shortages, Severe Shortages, and Extreme Shortages. Within the WSDM Plan, these terms have specific meanings relating to Metropolitan's ability to deliver water to its customers.

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

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

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

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

The WSDM Plan also defines five surplus management stages and seven shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in Metropolitan's storage programs. Thus, a ten percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage. Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage for that year. Each stage is associated with specific resource management actions designed to (1) avoid an Extreme Shortage to the maximum extent possible and (2) minimize adverse impacts to retail customers if an Extreme Shortage occurs. The current sequencing outlined in the

WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix.

Surplus Stages

Metropolitan's supply situation is considered to be in surplus as long as net annual deliveries can be made to water storage programs. Deliveries for storage in the Diamond Valley Lake and in the SWP terminal reservoirs continue through each surplus stage, provided that there is available storage capacity. Withdrawals from Diamond Valley Lake for regulatory purposes or to meet seasonal demands may occur in any stage. Deliveries to other storage facilities may be interrupted, depending on the amount of the surplus.

Shortage Actions

When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, it is still able to meet all end-use demands for water. For shortage stages 1 through 4, Metropolitan will meet demands by withdrawing water from storage. At shortage stages 5 through 7, Metropolitan may undertake additional shortage management steps, including issuing public calls for extraordinary conservation, considering curtailment of Interim Agricultural Water Program deliveries in accordance with their discounted rates, exercise water transfer options, purchase water on the open market.

At shortage stage 7 Metropolitan will develop a plan to allocate available supply fairly and efficiently to full-service customers. The allocation plan will be based on the Board-adopted principles for allocation. Metropolitan intends to enforce these allocations using rate surcharges.

Under the current WSDM Plan, the surcharges will be set at a minimum of \$175 per acre-foot for any deliveries exceeding a member agency's allotment. Any deliveries exceeding 102% of the allotment will be assessed a surcharge equal to three times Metropolitan's full-service rate.

Figure 6-1 shows the actions under each surplus and shortage stage, as well as the transitions to each supply declaration. Metropolitan will declare a shortage whenever water supply conditions require resource management activities included in Shortage Stages 1-4. Metropolitan will declare a Severe Shortage if supply conditions require undertaking actions in Shortage Stages 5-6. Finally, Metropolitan will declare an Extreme Shortage if Shortage Stage 7 actions are required. The overriding goal of the WSDM Plan is to never reach Shortage Stage 7, an Extreme Shortage. Given present resources, Metropolitan fully expects to achieve this goal over the next twenty five years.

**Figure 6-1
Surplus and Shortage Stages**

Surplus Stages					Shortage Stages						
Surplus					Shortage		Severe Shortage		Extreme Shortage		
5	4	3	2	1	1	2	3	4	5	6	7
					Actions Make Cyclic Deliveries Fill Semitropic, Arvin-Edison Store supplies in SWP Carryover Fill Contractual GW Fill Monterey Reservoir Fill Eastside						
					Conduct Public Affairs Program						
					Take from Diamond Valley Take from Semitropic, Arvin-Edison Cut LTS and Replenish Deliveries Take from Contractual GW Take from Monterey Reservoir Call for Extraordinary Conservation Reduce IAWP Deliveries Call Options Contracts Buy Spot Water Implement Allocation Plan						

Potential Simultaneous Actions

List of Acronyms:

SWP = State Water Project LTS = Long Term Seasonal IAWP = Interim Agriculture Water Program GW = Ground Water

6.10 Catastrophic Supply Interruption Plan

Since the City relies on MWD’s for 90% of its water supply, MWD’s plan is crucial to be included in this plan in addition to measures that the City may need to adopt during a local catastrophe.

The following is the MWD catastrophic supply interruption plan:

A “type of planning be performed to evaluate supply reliability is a catastrophic supply interruption plan that document the actions to be undertaken to prepare for and

implemented during a catastrophic interruption in water supplies. For Metropolitan this planning is captured in the analysis to develop its Emergency Storage Requirements.

Emergency Storage Requirements

Metropolitan's criteria for determining emergency storage requirements were established in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. They were again discussed in Southern California's 1996 Integrated Resources Plan. Metropolitan's Board has approved both of these documents. These emergency storage requirements are based on the potential of a major earthquake damaging the aqueducts that transport Southern California's imported water supplies (SWP, CRA, and Los Angeles Aqueduct). The adopted criteria assume that damage from such an event could render the aqueducts out of service for six months. Metropolitan's planning, therefore, is based on 100 percent reduction in its supplies for a period of six months. Metropolitan's emergency planning is based on a greater shortage than required by the Act.

To safeguard the region from catastrophic loss of water supply, Metropolitan has made substantial investments in emergency storage. The emergency plan outlines that under such a catastrophe, interruptible service deliveries would be suspended and firm supplies to member agencies would be restricted by a mandatory cutback of 25 percent from normal-year demand levels. At the same time, water stored in surface reservoirs and groundwater basins under Metropolitan's interruptible program would be made available, and Metropolitan would draw on its emergency storage, as well as other available storage. Metropolitan has reserved approximately half of Diamond Valley Lake storage to meet such an emergency, while the remainder is available for dry-year and seasonal supplies. In addition, Metropolitan has access to emergency storage at its other reservoirs, at the SWP terminal reservoirs, and in its groundwater conjunctive use storage accounts. With few exceptions, Metropolitan can deliver this emergency supply throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted by a major earthquake. The WSDM Plan shortage stages will guide Metropolitan's management of available supplies and resources during the emergency to minimize the impacts of the catastrophe.

In addition to the criteria used to develop the emergency storage requirements, in 2005, Metropolitan cooperated with DWR and others on a preliminary study of the potential effects of extensive levee failures in the Delta. This study was limited in scope, and investigated only two of a potential range of scenarios. Metropolitan's analysis showed that its investment in local storage and water banking programs south of the Delta would provide it with the resources necessary to continue to operate under the scenarios investigated. In particular, Metropolitan's analysis showed that it would be able to supply all firm requirements to its member agencies under both scenarios, but that it would need to interrupt replenishment deliveries to the area's groundwater basins and curtail water

supplies to one third of the interruptible agriculture within its service territory. Metropolitan's analysis further suggested that the scenarios investigated were not the worst-case situation. Under more extreme hydrology, Metropolitan might have to reduce firm deliveries to Metropolitan's member agencies by as much as 10 percent.

Electrical Outages

Metropolitan has also developed contingency plans that enable it to deal with both planned and unplanned electrical outages. These plans include the following key points:

In event of power outages, water supply can be maintained by gravity feed from Diamond Valley Lake.

Maintaining water treatment operations is a key concern. As a result, all Metropolitan treatment plants have backup generation sufficient to continue operating in event of supply failure on the main electrical grid.

Valves at Lake Skinner can be operated by the backup generation at the Lake Skinner treatment plant.

Metropolitan owns mobile generators that can be transported quickly to key locations if necessary.”

In a catastrophic event, the City will activate Stage “E” of the Emergency Water Conservation Plan Ordinance to accomplish a 50% reduction in water use. Available water supply use will be limited for health and safety use.

6.11 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES DURING SHORTAGES

Table 6-2 presents the City Water Fund revenues and expenditures in the water year 2002 and the impacts to those revenues and expenses based upon three different reduction scenarios in water sale (10%, 20%, & 50%).

**Table 6-2
Revenues and Expenditures Based on Current Water Rates**

OPERATING REVENUES	BASE USE ACTUAL FY 2002	REDUCTION IN WATER USE		
		10%	20%	50%
Operating Revenues				
Water Sales	\$15,080,482	13,572,433.8	12,064,385.6	7,540,241
Interest	\$1,412,000	1,270,800	1,129,600	706,000
Lease of properties & Miscellaneous	\$140,347	\$140,347	\$140,347	\$140,347
TOTAL	\$16,632,829	\$14,983,580.8	\$13,334,332.60	\$8,386,588.00
Operating Expenses				
Purchase of Water	\$7,122,176	\$6,409,958.40	\$10,825,707.52	\$12,178,920.96
Debt service*	\$1,940,600	\$1,395,400.00**	\$1,395,400.00	\$850,200.00
Other***	\$7,236,760	\$7,236,760	\$7,236,760	\$7,236,760
TOTAL	\$16,299,536	\$7,236,760.00	\$19,457,867.52	\$20,265,880.96
Surplus (Deficiency)	333,293	(58,537.6)	(995,568.2)	(3,806,660)

* 1998 Water Revenue Bond, 1993 Refunding Bonds Series A, & 1973 & 1976 GO Bonds.

** Debt service has decreased since 1973 & 1976 GO Bonds will be paid off in 2003.

*** Includes personnel services, materials and supplies, contractual services, maintenance FD Service charges, IT fund service charges, reprographic user charges, liability insurance fund charges, cable TV charges, and other charges.

These reductions in revenue are applied only to impacted items such as water sales and interests. All other revenues and expenditures are assumed to remain constant.

Table 6-3 shows that 10%, 20%, or 50% reductions in water sales result in a surplus for 2006, 2007, 2008, 2009, and 2010.

A water rate study was completed in May of 2005. A rate increase was proposed and implemented in July of 2005. The City is currently proposing two water rate increases.

An 8% increase which will become effective January 2006, and 12% which will become effective July 2006. .

Table 6-3 shows the projected revenues and expenditures for FY 2006-2010 based on the increase in water rates in July of 2005, January of 2006, and July of 2005. Increase in revenue for 2005-06 due to water rate increases are considered as of January 2006 for 8% only.

**Table 6-3
Revenues & Expenditures Based on the Proposed Rate Studies**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Projected Revenues (PR)					
Water Rate Revenues	18,268,282	21,247,417	23,372,159	24,540,767	25,276,990
Interest earnings	407,291	708,628	450,281	376,608	400,594
Lease of Property	48,740	50,202	51,708	53,260	54,857
Rent - New Facility	745,578	745,578	745,578	745,578	745,578
Miscellaneous	27,058	27,870	28,706	29,567	30,454
Total Revenues	19,496,949	22,779,695	24,648,432	25,745,780	26,508,473
Projected Expenses (PE)					
Net (PR-PE)	(3,288,256)	(1,570,005)	(194,233)	542,897	797,995
Capital & Unrestricted	20,751,043	14,172,554	9,005,624	7,532,155	8,011,888
Bond or Other Financing	-	19,000,000		20,000,000	
Depreciation	3,554,413	3,554,413	3,554,413	3,554,413	3,554,413
Capital Projects	6,185,000	25,141,000	3,875,000	22,300,000	4,369,250
Debt Service Principal	659,646	695,764	628,346	639,626	673,564
New Debt Service Principal		314,575	330,304	677,951	711,848
Restricted (Debt Reserve)	1,024,089	1,024,089	1,024,089	1,024,089	1,024,089
Total Cash On Hand	15,196,643	10,029,712	8,556,243	9,035,977	7,633,723
10% Cut in Revenue	17,629,392	20,584,091	22,266,188	23,254,043	23,940,715
10% Cut in Expenses	2,021,786	10,315,013	13,607,923	14,189,515	16,303,702
Difference	15,607,606	10,269,078	8,658,266	9,064,528	7,637,012
20% Cut in Revenue	15,761,834	18,388,486	19,883,944	20,762,305	21,372,956
20% Cut in Expenses	(256,735)	7,880,043	11,123,656	11,669,226	13,732,654
Difference	16,018,569	10,508,443	8,760,288	9,093,079	7,640,302
50% Cut in Revenue	10,159,163	11,801,673	12,737,212	13,287,093	13,669,681
50% Cut in Expenses	(7,092,297)	575,133	3,670,857	4,108,362	6,019,511
Difference	17,251,459	11,226,540	9,066,356	9,178,731	7,650,170

As part of the City's long-term water capital improvement program, approximately \$9,813,000 funding will be provided from year 2001 and beyond to replace the water mains, water meters, reservoir rehabilitation, and the Water Division's share of the new City Yard Maintenance facility, etc. During the past six years (1995-2001), the City has completed Six-Year Water Capital Improvement Programs with a total of approximately \$3,975,000 expenditures.

APPENDIX A
REFERENCES

APPENDIX A

REFERENCES

1. Metropolitan Water District of Southern California. "The 2005 Draft Regional Urban Water Management Plan." Draft October, 2005.
2. City of Beverly Hills. "Urban Water Management Plan." 2000.
3. State of California, Department of Water Resources. "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan." January 18, 2005.
4. City of Beverly Hills. "Water Rate Study." May, 2005.
5. City of Beverly Hills. "Municipal Water Supply and Groundwater Study." Draft August, 1992.
6. Metropolitan Water District. "Integrated Water Resources Water Plan." July, 2004.
7. City of Beverly Hills. "Water System Master Plan."
8. Beverly Hills. "2004 Consumer Confidence Report."
9. City of Beverly Hills. "Reverse Osmosis Water Treatment Plan."
10. City of Beverly Hills. Letter Report (April 28, 2005.) Wells Status Report.

APPENDIX B
URBAN WATER MANAGEMENT PLAN
ACT

APPENDIX C
SUMMARY OF RECENT
AMENDMENTS TO URBAN WATER
MANAGEMENT PLANNING ACT

APPENDIX C
RECENT AMENDMENTS TO THE
URBAN WATER MANAGEMENT PLANNING ACT

Year Effective	Bill Number	Bill Author	Description
1990	AB 2661	Klehs	Eliminated sunset clause, and added metering
1991	AB 11X	Filete	Added Drought Contingency Plan
1991	AB 1869	Speier	Added Reclamation
1993	AB 892	Frazee	Revises the content of the UWMP
1993	SB 1017	McCorquodale	Includes a fee on water customers to recover the costs for preparing the Plan and implementing the reasonable water conservation measures
1994	SB 2853	Cortese	Recycled water bill
1995	AB 1845	Cortese	Added water supply and demand assessment of the reliability of the water service
1995	SB 1011	Polanco	Added water supply and demand assessment of the reliability of the water service
2000	AB 2552	Bates	Strengthens public notification requirements
2000	SB 553	Kelly	Revises the water demand management measures required to be desired

Year Effective	Bill Number	Bill Author	Description
2001	SB 610	Costa	Submittal of UWMP to DWR is a requirement for receipt of drought assistance.
2001	AB 901	Daucher	Requires information relating to the water quality of supply sources and its impact on water management strategies & supply reliability.
2001	SB 672	Machado	Requires options that maximize resources and minimize the need to import water from other regions.
2001	SB 221	Kuehl	Requires written verification from the public water system that a sufficient water supply is available prior to the approval of map for a development of property of more than 500 dwellings.
2002	SB 1348	Brulte	Requires the DWR to take into consideration whether the urban water supplier is implementing or planning the implementation of water demand management activities.
2002	SB 1384	Costa	Requires urban water suppliers, which rely upon a wholesale agency, to provide the wholesale agency with water use projections from that agency in 5-year increments to 20 years.
2002	SB 1672	Costa	Authorizes a regional water management group to prepare and adopt a regional plan.

Year Effective	Bill Number	Bill Author	Description
2003	AB 105	Wiggins	Requires the urban water supplier to submit a copy of the plan to the California State Library.
2004	SB 318	Alpert	Describe the opportunities for development of desalinated water.

APPENDIX D
CITY COUNCIL RESOLUTION
APPROVING THE 2005 PLAN

APPENDIX E
CITY OF BEVERLY HILLS'
CONSUMER CONFIDENCE REPORT
2004

APPENDIX F
2005 DRAFT REGIONAL
URBAN WATER
MANAGEMENT PLAN
SECTION II: PLANNING FOR THE
FUTURE

APPENDIX G
EMERGENCY WATER
CONSERVATION PLAN
ORDINANCE NO. 92-O-2139

APPENDIX H
CITY ORDINANCE NO. 93-O-2162

APPENDIX I
2005 DRAFT REGIONAL
URBAN WATER
MANAGEMENT PLAN
SECTION III: IMPLEMENTING THE
PLAN