CITY OF BEVERLY HILLS
STAFF REPORT

Meeting Date: August 2, 2011

To: Honorable Mayor & City Council

From: Daniel E. Cartagena, Senior Management Analyst

Subject: 2010 City of Beverly Hills Urban Water Management Plan

Attachments: 1. 2010 Urban Water Management Plan

INTRODUCTION

State law requires urban water suppliers 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 an urban water management plan. Urban water management plans are required to be updated every five years. This 2010 plan would update the plan adopted by the City in 2005.

The Urban Water Management Act directs water agencies to carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future demands. Urban water suppliers are required to assess current demands and supplies over a 20-year period planning horizon and consider various drought scenarios.

Required elements of the plan include:

- Introduction
- Water Sources & Supplies
- Water Quality
- Water Demands
- Water Reliability Planning
- Water Demand Management Measures (DMM)
- Water Shortage Contingency Plan

The Urban Water Management Plan Act requires urban water suppliers to describe and evaluate:

- Water deliveries and uses
- Water supply and sources
- Efficient water uses
- Demand Management Measures (DMM)

The Urban Water Management Plan Act also requires water shortage contingency planning and drought response actions to be included in the final plan.

Finally, due to legislative changes resulting from the November 2009 passage of SBx7-7, development of an urban water management plan will require water agencies to set targets and track progress towards decreasing daily per capita urban water use of 20% by 2020.

The 2009 changes to state law also resulted in the extension of the deadline for submitting an adopted UWMP to July 31, 2011. Cities delayed in submitting an adopted plan are not eligible for state grants or loans until their plan adopted plan is submitted.

In spite of this extension, the City is late adopting its plan. This is due to a delay in circulating the mandated 60-day notice of preparation as required by state law. The City was required to notify the County of Los Angeles and the City of West Hollywood. This notice was sent May 12, 2011. The May 12th notice would have allowed for the City Council to take up this matter at its July 19th meeting. However, the July 19th meeting was cancelled. Therefore, staff moved the item to the August 2nd City Council Agenda.

DISCUSSION

City of Beverly Hills Water

The City of Beverly Hills provides water service to all of the City of Beverly Hill and to portions of the City of West Hollywood. The service area population is 43,910. Beverly Hills constitutes 35,564 of the population and West Hollywood 8,346. The services area consists of 11,013 water accounts.

Water Supply Resources

Generally, there are five recognized water sources available to water agencies: imported water, groundwater, recycled water, desalinated water and graywater. Most of the City's water supply is obtained from two sources: imported surface water purchased from the Metropolitan Water District (MWD) and local groundwater extracted from the Hollywood Subbasin. The City experiences a nominal amount of conservation through the individual use of Graywater.

Recycled water requires a separate infrastructure for conveyance and distribution. The sizable expense to construct and maintain such an infrastructure limits the existing recycled water system towards a customer base of large scale water user such as water agencies for use as a barrier for seawater intrusion into aquifers, industrial and refinery plants for use to cool of equipment and organizations with considerable lawns and landscape requiring irrigation. Without a large user in close proximity to Beverly Hills, an expansion of the program to include the City is cost prohibited. Consequently, recycled water is not considered as an alternate source. The same is true for desalinated water. There are a number of demonstration projects involving desalination technology. However, the economics of building and operating a desalination system impacts this technology from advancing to a large scale water supply option. Graywater or water from sinks, bathtubs, dishwashers and clothes washers used for irrigation is promoted by the City on an individual basis. Beverly Hills' Graywater Program incorporates elements of the California Green Building Code. Since August 4, 2009, Beverly Hills

residents have the option to utilize Graywater for irrigation purposes on an individual or property basis.

Approximately 90% of the City's water supply is purchased from MWD. The remaining 10% is locally produced groundwater originating from the Hollywood Subbasin and treated at the City's Treatment Plant. As a charter member of MWD, the City has been purchasing water from this agency since 1928. MWD receives its water supply from two sources: Colorado River Aqueduct and the Sacramento – San Joaquin Delta via the State Water Project. In its Regional Urban Water Management Plan, MWD reports that sufficient water for its members, including Beverly Hills, between the years 2011 to 2035.

The City locally produces 10% of its water from the Hollywood Subbasin. Groundwater is pumped from the subbasin, transported and treated at the City Treatment plant. Once treated the ground water is blended with the imported water and ready to be sold to customers.

The yield in production of groundwater is impacted by two significant factors: the replenishment of the aquifer and operation and maintenance of the treatment plant. When a water-well's static level drops below a safe yield level, the City will stop pumping water from that well to allow for its replenishment. Taking one or more wells off-line reduces the amount the water the City can locally produce. This is also true for City's Treatment Plant. It is taken off-line for periods of time for standard maintenance. Because of the frequency of these two factors, the 2010 UWMP utilizes the most conservative production number of 800 Acre Foot (AF) per year in its assumptions, though the City averages the production of 1,000 AF per year.

The City continues its investigation of new sources of water. Under consideration is the development of a new well at the City-owned property on Roberson Boulevard in West Hollywood. Moreover, should third party financing be found opening up the opportunity to pursue shallow groundwater development. These projects are included in the City's Capital Improvement Program budget.

Water Demands

The City is fully developed with minimal population growth in the foreseeable future. Water use within Beverly Hills service area is variable and depends on a number of factors which range from increases and decreases in irrigation and water losses due to changes in plumbing fixtures and customer's usage habits.

The City's image as a high-end community is due in part to its dedication to its lush garden-like landscaping both in the private and public sectors. With over half of the City zoned for low to medium single family dwellings, much of the City's water use is directed towards landscapes requiring consistent irrigation. Adding that a sizable number of residents maintain a backyard pool or other water features, Beverly Hills' water use is high when compared to its neighbors within the region.

It is recognized that most of the City's per capita water consumption is used for landscape and irrigation. Consequently, as the City considers policy alternatives to meet future conservation targets, success may be achieved by focusing its efforts on leak detection and tightening landscape or plumbing programs which would lessen the effects of cut-backs on personal water-use.

20 x 2020

Due to supply concerns in the San Joaquin Delta, the California Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to enforce statewide water conservation. The new legislation calls for a 20% reduction in potable water use by December 31, 2020.

To satisfy the provisions of SBx7-7, the City had to establish it's Gallons per Capita per Day (GPCPD) water use target for the year 2020 as well as an interim target for 2015. To determine the City's historic GPCPD and set 5-year and 10-year baselines, water-use data was gathered from 1996-2006 (**Table 1**). Under Methodology 1, which uses a simple 10% reduction from baseline GPCPD to calculate the 2015 interim target and a 20% reduction from the baseline GPCD to calculate the 2020 target, the City's interim target is 277 GPCPD for 2015 and with a 2020 target of 284.4 GPCPD (**Table 2**).

In 2009, the GPCPD was 251. This is well below the City's 2015 and 2020 targets. With a proactive conservation message and support of an equally ambitious conservation program, the City could achieve and maintain its 2015 and 2020 targets well in advance of those milestones.

Table 1

City of Beverly Hills
Historic GPCPD Water Use

Year	Total Consumption (AF)	GPCD
2009	12,653	251
2008	13,453	269
2007	14,007	282
2006	13,286	269
2005	13,280	270
2004	14,042	286
2003	13,583	278
2002	13,598	283
2001	13,598	285
2000	14,093	302
1999	13,545	280
1998	13,139	277
1997	13,659	291
1996	13,368	287
10 yr. Baseline (1996-2005) (SB7: 10608.20)		284.4
5 yr. Baseline (2003-2007) (SB7: 10608.22)		277

Conservation

The City is committed to the efficient use of water. In 2004, the City of Beverly Hills became a member of the California Urban Water Conservation Council (CUWCC). As a member, the City implements recognized Best Management Practices (BMP) to promote water conservation. CUWCC 14 BMP's are policies, programs, practices, rules, regulation and ordinances that result in the more efficient use or conservation of water. Understanding the unique needs of its customers and the importance of efficient water use, the City implements these BMP's in addressing the needs of its residents.

An example unique to the City, because of the installation of SMART meters, allows for the notification to residents of meter readings identifying possible leaks and recommendation for the customer to investigate and if necessary contact a plumber to address any needed repair. Without SMART meters, notification of this type

Table 2

City of Beverly Hills
2020 Water Use Targets

Min. Reduction Requirement (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
263	228	141.5
2020 Per Capita Target:		228
2015 Interim Target:		256
2010 Per Capita Water Use:		228

could not be possible resulting in a loss of water.

The City continues its successful partnership with Metropolitan Water District offering rebate and educations programs to residents promoting the message, "Be Water Wise." The Water Wise campaign is a program that that promotes water conservation by providing water saving tips, tools, rebates and information designed to lessen household water consumption.

Water Reliability

Climatic and environmental conditions as well as legal issues continue to play a critical role in Southern California's water supply. In its efforts to maintain water deliveries to meet the needs of its members, MWD engages in the legislative policy arena at both the federal and state level and promotes capital investment to its system. The 2009 Water Reform legislation, supported by MWD, is an example of its efforts to establish a reliable process that will preserve its annual water allocation. Regarding capital improvements, MWD is developing new projects to increase the storage capacity of its supply. This dual approach promoting legislative consistency and expansion of storage capacity is to maintain water reliability in which its members depend.

Statewide, storage reservoirs levels rise and fall due to seasonal climate changes. Currently, all reservoir levels in California are 89% full or above. However, Southern California is expected to experience an increase in regional demands from 2015 through 2035. Although increases in demand are expected, they are limited due to the requirement of SBx7-7. Nevertheless, it is important that each water agency monitor its water consumption continuously.

Conclusions

The City can expect to meet its future water demand through 2035 under the scenarios studied as required by state law. However, should Southern California encounter prolonged dry periods leading into the type of drought conditions experienced in recent years, the City's imported water supply capacities may potentially be reduced depending MWD reservoir capacities. In this case the region and the City would be vulnerable to water shortages. This may require the City to once again impose its Emergency Conservation Ordinance.

On March 30, 2011, California's drought was declared over by Governor Jerry Brown. Recent winter rainfall brought an end to the three-year drought period. However, prior to this declaration and in response to MWD implementation of its conservation program, Beverly Hills initiated it's Stage – B Water Conservation program. Utilizing its 1992 Emergency Conservation Ordinance, the City required a 10% reduction in water consumption. As a result each water accounts was required to reduce consumption by 10%. The City calculated baseline allocation for all accounts by billing cycle with the factoring in the 10% reduction and provided this information to its customers. Additionally, an outdoor irrigation schedule was established in which between the hours of 9:00 am and 5:00 pm, customers south of Santa Monica Blvd. watered on certain days and those north of Santa Monica Blvd. watered on another an alternate group of days. No outdoor watering was allowed on Sundays. Postcard notices were mailed to customers advising them of possible leaks. Finally, in those situations where customers exceeding their baseline allocation for a billing cycle those customers were assess with

a Penalty Surcharge. The combination of these elements resulted in a 13% reduction in water consumed system-wide.

The City instituted an appeals process for customers to contest a penalty surcharge included in their water bill. To date the City has received approximately 1,132 appeals. 939 appeals have been processed. The remaining appeals are under review at this time.

NOTICE

Staff presented the Draft Urban Water Management Plan to the City's Public Works Commission and Groundwater Technical Committee for review and comment. Comments received from these bodies are included in the current draft.

Furthermore, Notice was published in both local publications two weeks prior to the Public Hearing inviting interested parties to review copies of the plan available in the libraries in both Beverly Hills and West Hollywood.

A copy of the Plan is also available for review in Beverly Hills Public Works & Transportation Building.

FISCAL

Conservation efforts will result in less water sales. Less water sold reduces the amount of revenue into the City's Water Enterprise Fund.

Current water-rate analysis does not assume the loss in revenue resulting from compliance with and achievement of the City's 20 x 2020 targets. However, staff will utilize the GPCD figures included in this plan, in future water-rate studies. Those rate studies will be presented to the City Council at a future date.

Additionally, the City will continue to explore opportunities to reduce costs to offset a loss in revenue.

RECOMMENDATION

This presentation is provided for informational purposes. The adoption of the 2010 Urban Water Management Plan is scheduled for the Council's Formal meeting later today.

David Gustavson
Approved By

Attachment 1

2010

City of Beverly Hills
Urban Water Management Plan

July, 2011
Draft Copy

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2010

URBAN WATER MANAGEMENT PLAN

City of Beverly Hills

July 2011 Draft Copy

Prepared by:

CONSULTING ENGINEERS
1130 W. Huntington Drive
Unit 12
Arcadia, CA 91007
(626) 821-3456

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SECTION 1: INTRODUCTION

1.1 PURPOSE AND SUMMARY

This is the 2010 Urban Water Management Plan (UWMP) 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 2010 Plan.

As part of the Act, the legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

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." These plans must be filed 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.)

The Act has been amended on several occasions since its initial passage in 1983. New requirements of the Act due to SBx7-7 state that per capita water use within an urban water supplier's service area must decrease by 20% by the year 2020 in order to receive grants or loans administered by DWR or other state agencies. The legislation sets an overall goal of reducing per capita urban water use by 20% by December 31, 2020. The state shall make incremental progress towards this goal by reducing per capita water use by at least 10% by December 31, 2015. Each urban retail water supplier shall develop water use targets and an interim water use target by July 1, 2011. Effective 2016, urban retail water suppliers who do not meet the water conservation requirements established by this bill are not eligible for state water grants or loans. An urban retail water supplier shall include in its water management plan the baseline daily per capita water use, interim water use target, and compliance daily per capita water use. DWR, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part. These new requirements are included in **Section 4: Water Demands.**

As part of the City's past and current sustainability goals, the City is currently implementing all facets of this plan to achieve 20% conservation by 2020.

1.2 COORDINATION

In preparing this 2010 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 libraries in the City. 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. On August 2, 2011, 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 2010 Plan by resolution. A copy of the City Council resolution approving the 2010 Plan is included in **Appendix D**.

As required by the Act, the 2010 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.

1.3 FORMAT OF THE PLAN

The chapters in this 2010 Plan correspond to the items presented in the Act:

Section 1 - Introduction

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

Section 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 Subbasin. In addition, this chapter discusses potential future water supplies.

Table 1.1
Coordination and Public Involvement

	Participated In Plan Preparation	Contacted for Assistance	Commented on Draft	Notified of Public Hearing	Attended Public Hearing
City Water Dept	x	x	x	x	x
City Public Works Commission		x	x	x	x
Groundwater Technical Committee					
City Management Dept.					
Beverly Hills City Council				x	x
Metropolitan Water District		x		x	
CA Dept of Water Resources				x	
LA Dept. of Water & Power				x	
LA County Dept. of Public Works				x	
Interested General Public			x	x	x

Section 3 – Water Quality

This chapter discuss water quality issues with the City's imported and groundwater sources and the effect of water quality on management strategies and supply reliability.

Section 4 – 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.

Section 5 – 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 2010 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.

Section 6 – Conservation Measures

This chapter addresses the City's compliance as a member of CUWCC with the current Best Management Practices (BMPs). The BMPs correspond to the 14 Demand Management Measures (DMMs) listed in the UWMP Act and are described in this section.

Section 7 – Contingency Planning

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 Water Surplus and Drought Management Plan (WSDM) is also described.

Appendices

The appendices contain references and specific documents that contain the data used to prepare this 2010 Plan.

1.4 WATER SYSTEM HISTORY

The Rodeo Land & Water Company was the original developer of the Beverly Hills area, completing and recording the subdivision map in 1906. 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 Subbasin and the LaBrea Subarea of the Central Subbasin. 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 Subbasin 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 1906, the City possesses appropriative rights in local groundwater.

Figure 1.1: State Water Project (SWP)

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") in December, 1928. MWD had the task to develop 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.

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 Utility is managed under the direction of the Environmental Utilities Manager under the direction of the Director of Public Works & Transportation.

Figure 1.2: Rodeo Drive

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 Subbasin and the La Brea Subarea in favor of purchasing water from MWD. However, the City retained its rights to extract groundwater from the Hollywood Subbasin 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 Subbasin aquifer. The City determined that

the Hollywood Subbasin 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 for a total of four 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 Acre Feet Per Year (AFY).

1.5 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. The City's service area is shown in **Figures 1.4** and **1.5**.

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

1.6 CLIMATE

The City has a Mediterranean climate with moderate, dry summers that reach an average temperature of up to 83°F and cool, wet winters that can dip as low as 45°F. The average rainfall for the region is approximately 15 inches as shown below in **Table 1.2**:

Table 1.2
Average Rainfall In City (40 Yr. Average)

Month	Rainfall (in)
Jan	2.7
Feb	3.5
Mar	2.0
April	1.2
May	0.1
June	0.0
July	0.0
Aug	0.0
Sep	0.2
Oct	0.4
Nov	1.8
Dec	2.6
Yearly Total	**14.5**

Due to low rainfall in 2007, the City issued a Stage A water restriction for its 2007-2008 fiscal year. In 2009, the City initiated a Stage B Conservation Program in conjunction with MWD's allocation program. Rainfall totals in the City are consistent with the rest of the Los Angeles region.

1.7 POPULATION

According to the most recent population figures from the California Department of Finance (taken from 2010 US Census counts), the current resident population of the City is approximately 34,000 with an average household size of 2.14 persons. In addition, the City serves a portion of the City of West Hollywood (see **Figure 1.4**). Thus, the total current resident population served by the City's water system is about 45,000. Population is expected to expand modestly with an annual growth rate of 0.22% over the next 25 years as shown in **Table 1.3** below.

Table 1.3
Population Projections

Year	Estimated Population
2015	45,632
2020	46,148
2025	46,646
2030	47,126
2035	47,587

Since Beverly Hills is a major job center for the region, daytime population has been estimated up to 250,000, due in large part to the number of businesses located in the City.

1.8 WATER SYSTEM

Imported Water

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 and Two (BH-1 & BH-2). Each connection has a capacity of 40 cfs which together are capable of delivering up to 46,336 AFY at 80 percent operation. Imported water received by the City is treated by MWD at its Weymouth Treatment Plant in La Verne. The City's imported water supply does not consists of a blend of water received from Northern California and the Colorado River.

Figure 1.3: Weymouth Treatment Plant

Groundwater

In addition to imported water, the City also receives groundwater from four groundwater wells that pump water from the Hollywood Subbasin. All of the City's raw groundwater is treated at the City's Reverse Osmosis Treatment Plant. The City runs three wells at a time and each combination effects the capacity and groundwater levels.

Distribution System

The City distributes its water to its customers through a 170 mile network of water mains ranging from 2 to 24 inches in size. The water system consists of sixteen pressure zones, two of which supply a portion of the City of West Hollywood. The City's water system serves the areas shown in **Figures 1.4** and **1.5** on the following pages.

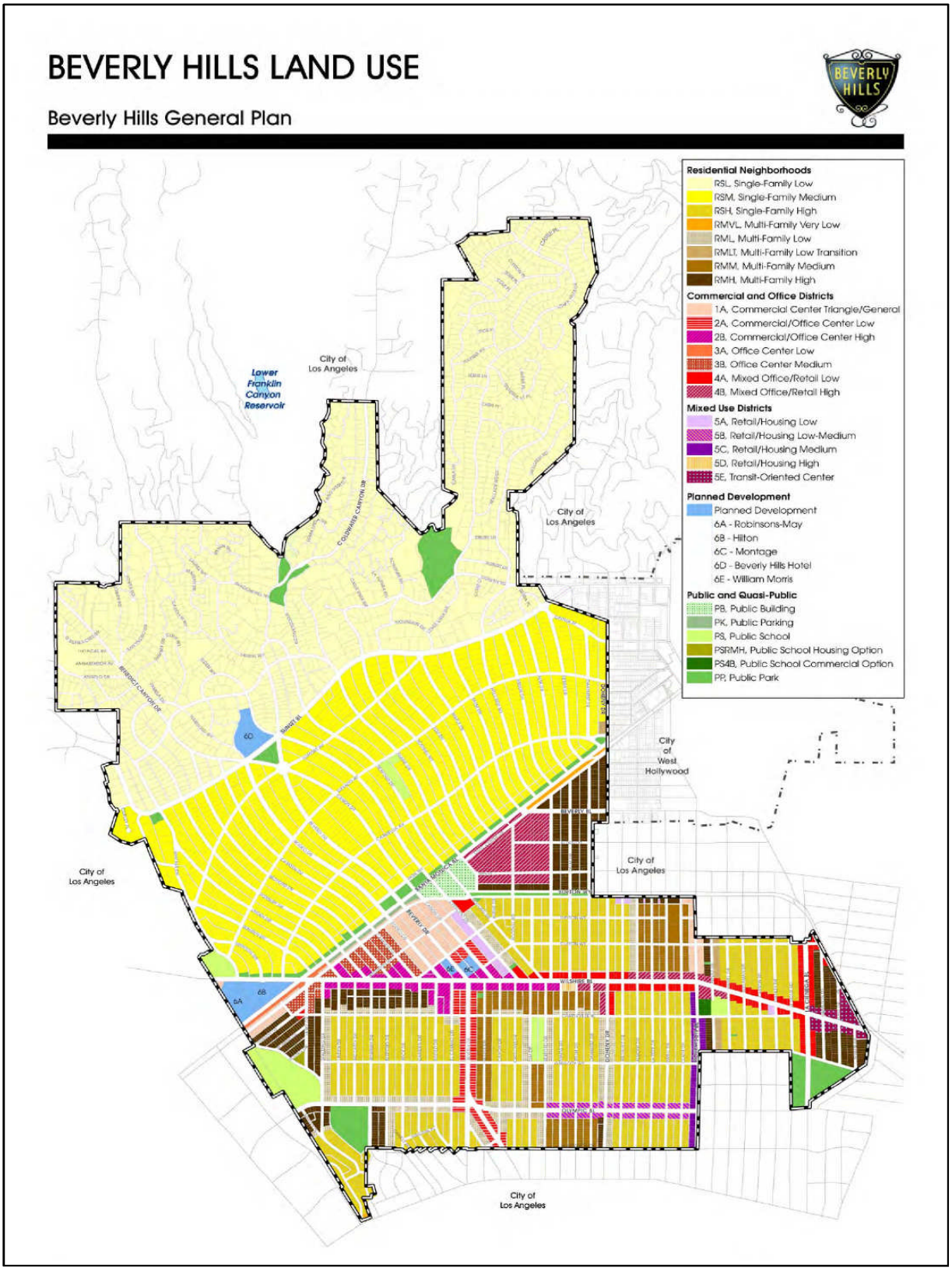

Figure 1.4: City of Beverly Hills

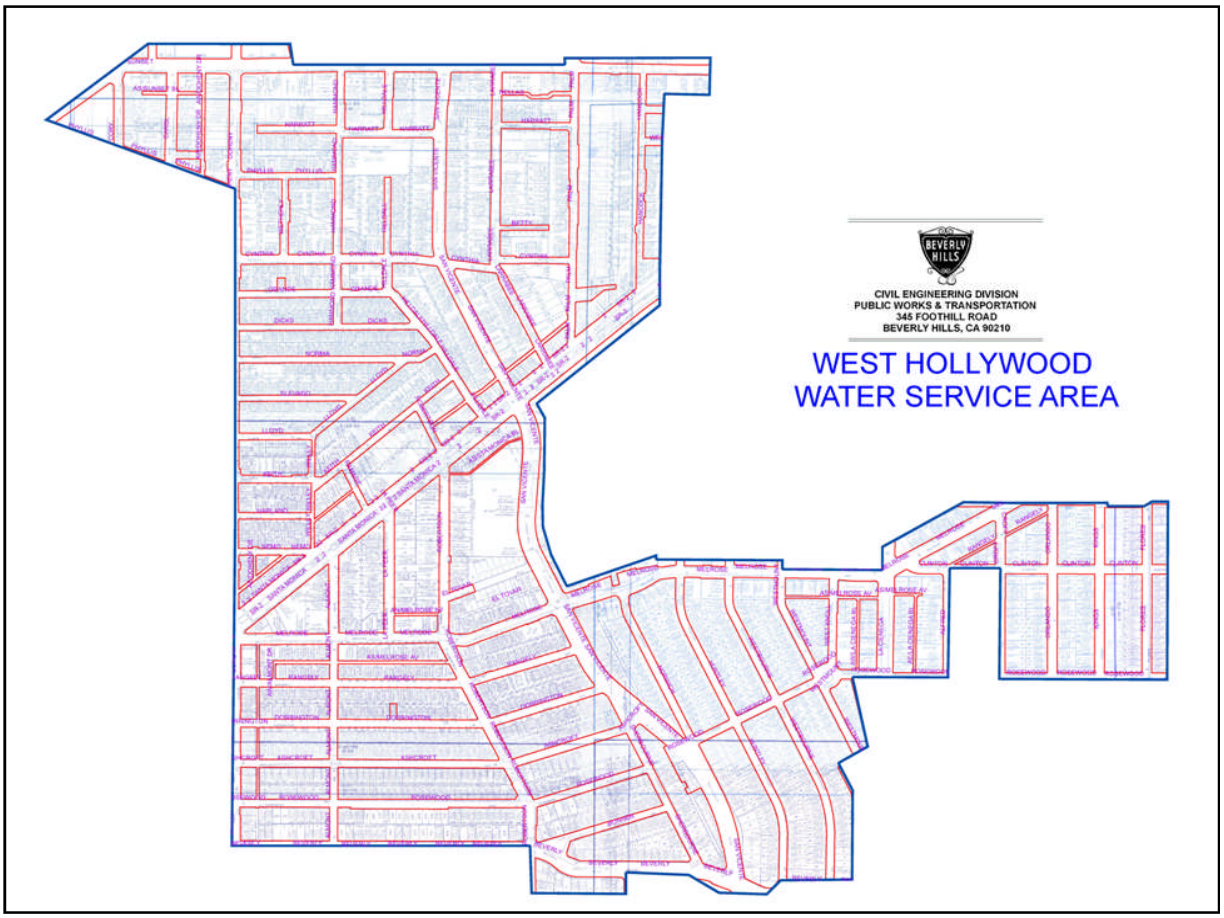

Figure 1.5: Portion of West Hollywood Receiving water from City

Water Storage

For storage needs, the City maintains 10 reservoirs, 7 of which are above ground and 3 of which are underground. Four of these reservoirs are currently or scheduled for construction improvements and one has been substantially completed (Reservoir No. 5).

Figure 1.6: City Reservoir No. 5

Table 1.4 lists the City's reservoirs:

Table 1.4
City Reservoirs

Reservoir	Description	Capacity (MG)
3A*	Steel/Above ground	0.81
4A	Concrete Above ground	2.2
4B*	Steel Above ground	1/1.14
5	Steel/Above ground	1.0
6*	Steel/Above ground	1.0
7*	Steel/Above ground	1.5
Woodland	Concrete/Above ground	2.0
Greystone	Concrete/Underground	19.5
Sunset	Concrete/Underground	6.0
Coldwater	Concrete/Underground	8.5
	Total Capacity:	**43.5**

*Currently under construction or to be re-constructed.

Emergency Interconnections

In addition to imported water and local groundwater, the City's water supply 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.

Table 1.5 summarizes the City's emergency interconnections with LADWP:

Table 1.5
City of Beverly Hills
Emergency Connections with LADWP

Location	Capacity (cfs)
Booster Sta. No. 2	14
Reservoir No. 7	2 - 11

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.

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SECTION 2: WATER SUPPLY RESOURCES

2.1 INTRODUCTION

The City obtains its water supply from two sources: local groundwater extracted from the Hollywood Subbasin, and imported surface water purchased from the Metropolitan Water District (MWD).

2.2 SOURCES OF SUPPLY

Imported Water

The City's imported water originates in the Colorado River and the Sacramento-San Joaquin River Delta in Northern California. These two water systems sustain Southern California's population by providing a renewable and reliable water supply to the region. The Colorado River, for instance, supplies California with 4.4 million acre feet (MAF) of water annually under current entitlements. Most of this water (3.85 MAF maximum) is used to sustain agricultural production in Imperial and Eastern Riverside County. The remaining unused portion is used for urban purposes in Southern California.

Figure 2.1: Parker Dam at Colorado River

In addition to the Colorado River, the Sacramento-San Joaquin River Delta provides a significant amount of supply annually to Southern California. The Delta is located at the confluence of the Sacramento and San Joaquin Rivers east of the San Francisco Bay and is the West Coast's largest estuary. The Delta supplies Southern California with over 1 MAF of water annually.

Figure 2.2: Sacramento-San Joaquin Delta

The use of water from the Colorado River and the Sacramento-San Joaquin Delta continues to be a critical issue. In particular, Colorado River water allotments have been debated among the seven basin states and various regional water agencies at both the federal and state levels. The use of Delta water has been debated as competing uses for water supply and ecological habitat have jeopardized the Delta's ability to meet either need and have threatened the estuary's ecosystem.

In order to provide the member agencies with imported water, MWD utilizes two separate aqueduct systems (one for each source of supply) to obtain its supplies. These two aqueduct systems convey water from each source into two separate reservoirs whereupon MWD pumps the water to one of its five treatment facilities. One of these aqueduct systems is known as

the Colorado River Aqueduct (CRA). The CRA was constructed as a first order of business shortly after MWD's incorporation in 1928. The CRA is 242 miles long and carries water from the Colorado River to Lake Matthews and is managed by MWD.

Figure 2.3: Colorado River Aqueduct

In addition to the CRA, MWD receives water from northern California via the California Aqueduct. Also known as the State Water Project, the California Aqueduct is 444 miles long and carries water from the Delta to Southern California and is operated by the Department of Water Resources.

Figure 2.4: California Aqueduct

The previously mentioned aqueducts supply Southern California with a significant amount of its water and are crucial to its sustainability. In addition to these two water systems, there are also several other aqueducts that are vital to the State. The major aqueducts in California are shown in **Figure 2.5** on page 2-3. Overall, about 67% of the City's imported water is from the SWP and about 33% is from the CRA.

Imported Water Purchases

As a wholesale agency, MWD distributes imported water to its 26 member agencies throughout Southern California. The City is one of 15 retail agencies served by MWD. West Basin Municipal Water District (WBMWD), which serves the City of West Hollywood, is one of 11 wholesale agencies served by MWD. The City has two connections (BH-1 and BH-2) to the MWD Santa Monica Feeder System, each having an operational capacity of 40 cfs or approximately 23,000 AFY (at 80% capacity). The City's Tier 1 rate allocation is 13,380 AFY. **Table 2.1** presents the City's five-year historic water purchases from MWD from 2005 to 2009. The City's imported supplies account for less than 1% of MWD's supply totals.

Table 2.1
Five-Year Historic Purchases from MWD

Year	Purchases (AF)
2009	11,801
2008	12,179
2007	12,776
2006	12,046
2005	11,918

Historically, MWD has provided roughly 45-60 percent of the total non-agricultural water used within its service area. In order to ensure future reliability, MWD encourages its member agencies to develop local supplies, including groundwater and recycled water. With rising imported water costs, the City has an incentive to produce more water through its groundwater system.

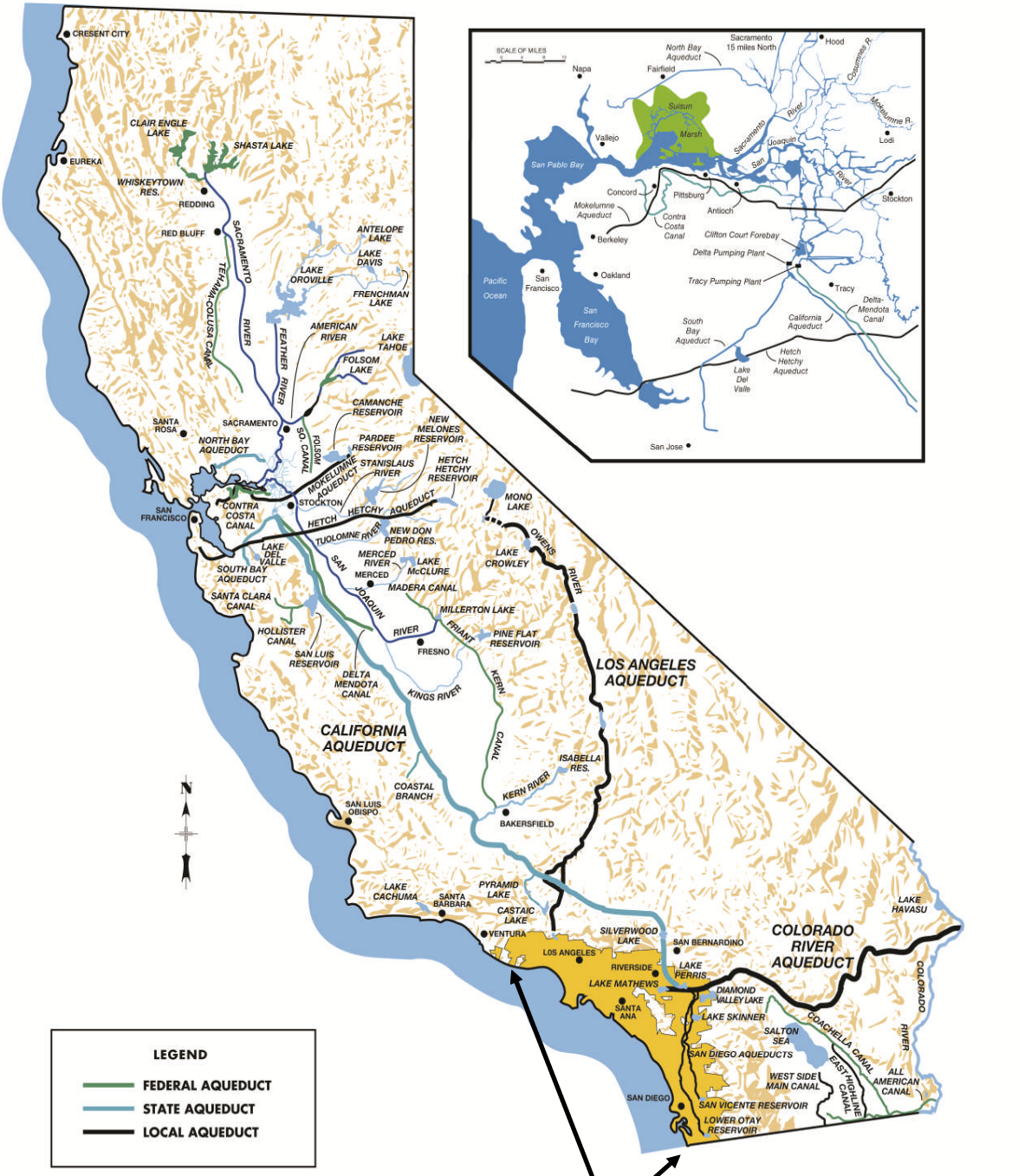

Figure 2.5: Aqueduct Systems in California (Figure A.2-5 in MWD's 2010 RUWMP)

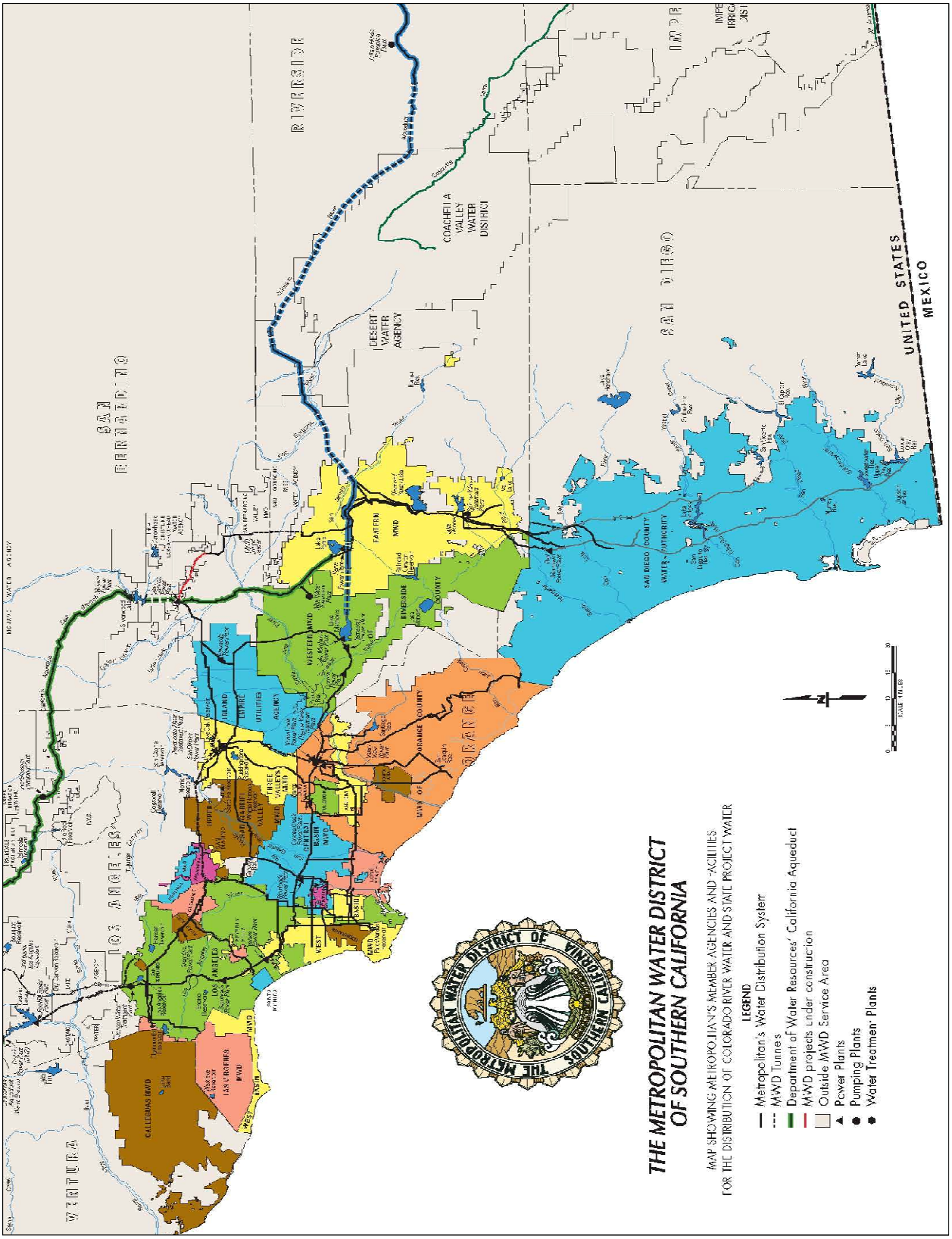

Figure 2.6: MWD Service Area Map (MWD Serves City of Beverly Hills)

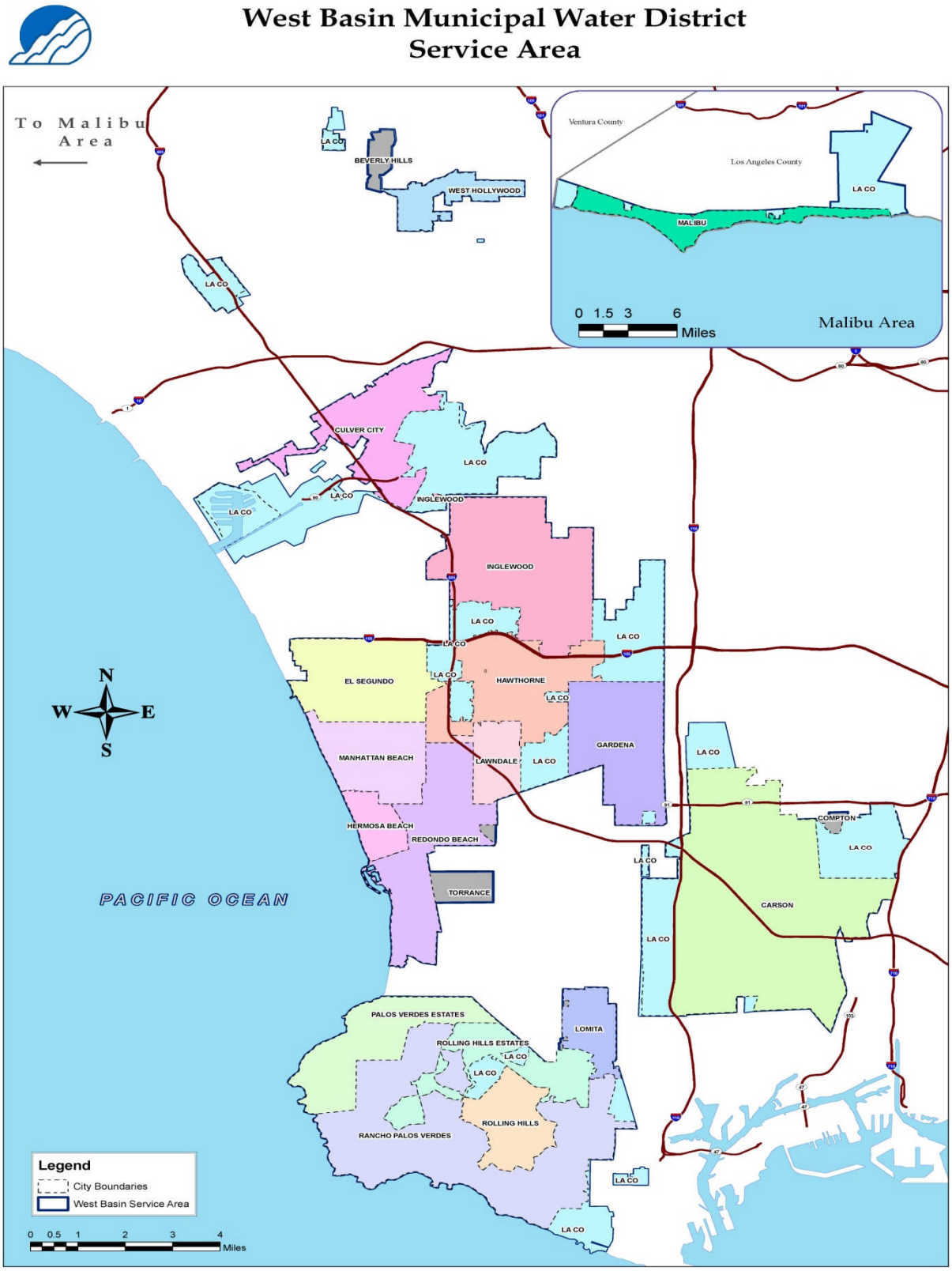

Figure 2.7: WBMWD Service Area Map (WBMWD Serves City of West Hollywood)*

***WBMWD is a potential recycled water supplier to the City of Beverly Hills (see Section 2.5)**

Groundwater

The City of Beverly Hills obtains its groundwater supply from the Hollywood Subbasin (Basin). The Basin is located in western Los Angeles County and is bounded on the north by Santa Monica Mountains and the Hollywood fault, on the east by the Elysian Hills, on the west by the Inglewood fault zone, and on the south by the La Brea High, formed by an anticline that brings impermeable rocks close to the surface. The Basin has a surface area of 10,500 acres (16.4 square miles) of mostly flat to mildly hilly terrain and underlies the northeastern part of the Coastal Plain of Los Angeles Groundwater Basin. Overlying water agencies include the Cities of Beverly Hills, West Hollywood, and Los Angeles. **Figure 2.8** below shows the basin's geographic region.

Water-bearing formations of the Hollywood Subbasin include unconsolidated and semi-consolidated marine and alluvial sediments deposited over time. Key production aquifers include the deeper aquifers of the San Pedro Formation (Jefferson, Lynwood, Silverado, and Sunnyside) and the shallower aquifers of the Lakewood Formation (Exposition and Gage). The aquifers of the San Pedro Formation are found only in the western portion of the Basin. The Gage aquifer is the major water-bearing member of the Basin, however, in general, aquifers in the Basin are not highly transmissive and do not yield significant amounts of groundwater expect in the deeper aquifers of the San Pedro Formation.

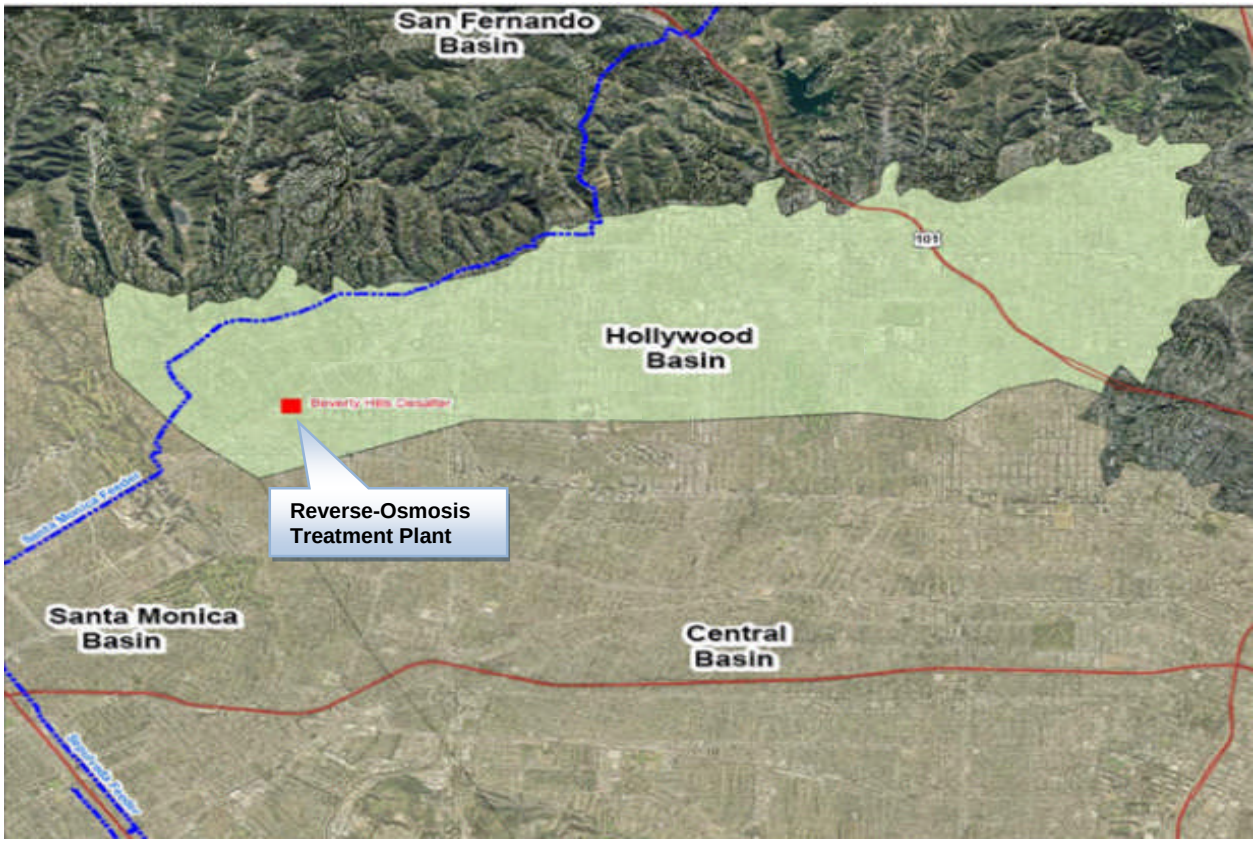

Figure 2.8: Hollywood Subbasin

Groundwater in the Hollywood Subbasin is replenished naturally by percolation from precipitation, receiving an average annual precipitation of about 14 inches, by surface stream flows and subsurface inflows from the Santa Monica Mountains to the North. The Basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels. As a result, the surface area open to direct percolation has decreased significantly and thus natural replenishment to the basin's water-bearing formations is limited to only a small portion of basin soils. Since the Basin does not receive any artificial recharge through injection wells or spreading basins, groundwater production is limited by low safe-yield limits.

Groundwater flow in the Basin is generally from the Santa Monica Mountains and out towards the Central Basin to the South. The USGS has estimated groundwater outflows of about 5,900 AFY to the Central Basin. However, there are no formal agreements regarding this outflow.

Figure 2.9: Hollywood Reservoir

The total storage in the basin is estimated to be approximately 200,000 acre-feet (MAF). Unused storage space has not been estimated. The natural safe yield of the Basin (natural replenishment only) was estimated to be about 3,000 AFY. Since the Basin does not receive artificial recharge, the actual annual pumping limits are equal to the natural safe yield of 3,000 AFY.

Groundwater levels in the basin are generally at or above mean sea level (MSL) and aquifers in the western portion of the Basin (the main groundwater producing zone) are estimated up to 660 feet in depth. Thickness of water bearing units in the Basin range 60 to 175 feet.

Figure 2.10: Reverse Osmosis Treatment Plant

Since the aquifers underlying the City are not located near the ocean, seawater intrusion does not pose a risk to the City's groundwater supply. Also, due to the Newport-Inglewood uplift, outflows from the Santa Monica Basin (where risk of seawater intrusion is high), are restricted. Thus, there are no seawater intrusion barriers in the Basin.

Due to the natural replenishment of the basin and mild pumping activity, there are no spreading grounds in the Basin. In an effort to eliminate long-term overdraft conditions, groundwater levels are monitored and the City also works closely with other agencies in the Basin to prevent overdraft.

The Hollywood Subbasin is unadjudicated and is presently managed by the City of

Beverly Hills through municipal ordinances. These municipal ordinances regulate the production of groundwater, prohibit waste, protect water quality and require dewatering activities to mitigate adverse impacts on the Hollywood Basin. The California Department of Health Services provides additional oversight of the Basin's groundwater quality and help monitor contaminant levels.

The key characteristics of the Hollywood Subbasin are summarized below in **Table 2.2**:

Table 2.2
Hollywood Subbasin
Summary of Characteristics

Item	Amount
Max. Depth to Groundwater	660 ft.
Thickness of Groundwater Table	60 - 175 ft.
Storage	200,000 AF
Natural Safe Yield	3,000 AFY
Adjudicated Rights	Pending
Spreading Basins (Total)	0
Seawater Intrusion Barriers	0
Desalters	1

Groundwater Production

The City draws its groundwater from four groundwater wells (Nos. 2, 4, 5 and 6) that pump water from the Basin. Each of these wells distribute raw groundwater to the City's reverse osmosis treatment plant (see **Figure 2.10**) which treats all of the groundwater the City produces. The plant supplies the City with approximately ten percent (10%) of its average annual water supply for the past five years and has a capacity of 1,500 AFY.

Occasionally, the City's groundwater facilities experience reliability issues that can affect the supply reliability. For instance, the reverse osmosis plant was off line for three months in 2008 and 2009. In 2008, the lack of production from the plant increased imported water purchases from MWD.

Table 2.3 presents the City's groundwater supply from 2005-2009 based on fiscal years

Table 2.3
Five-Year Historic Groundwater Production

Year	Production (AF)
2009	1,311
2008	884
2007	1,357
2006	1,142
2005	1,281
Average:	**1,195**

Table 2.3 illustrates that the City operates well below the Basin safe yield of 3,000 AFY.

2.3 WATER SUPPLY SUMMARY

The City's water supply consisted of imported water purchases and local well production from 2005-2009. Since the total imported water purchases and groundwater production in the City are equal to water sales plus system losses, it can be noted that the City has been trending towards increased water use efficiency which has reduced demands on imported water. In comparing **Table 2.1** with **Table 2.3** between 2005 and 2009 it can be seen that the local well production increased while imported water purchases decreased.

2.4 PROJECTED SUPPLY OUTLOOK

The City expects to reduce their dependency on imported water through groundwater production from its wells. The City is also looking into additional groundwater production from shallow groundwater wells in its Robertson Yard facility in the City of West Hollywood and from wells in the La Brea Subarea of the Central Basin, of which the City has historic groundwater rights. Although West Basin Municipal Water District (WBMWD) provides most of its service area with recycled water, the City has no specific plans in place to use recycled water due to lack of infrastructure provided by WBMWD. Thus, the City expects to use potable water only from its imported connections with MWD and its groundwater wells. **Table 2.4** displays the City's projected supply availability outlook:

Table 2.4
Projected Water Supply Availability

Year	Imported (AF)	Ground (AF)
2015	18,853	800
2020	21,563	800
2025	22,893	800
2030	21,641	800
2035	20,560	800

Based on the City's pursuit of additional groundwater supplies, the City's overall water supply reliability is expected to increase. The City will also continue to benefit indirectly from regional conservation efforts and also through MWD's efforts to augment its supplies and improve reservoir storage capacities. **Section 5** discusses supply reliability and compares the City's projected water supply availability to projected demands for normal, dry, and multiple dry years through 2035.

2.5 ALTERNATE SUPPLY SOURCES

This section provides an overview of alternative water sources (non-potable supplemental supplies) and their potential uses. Alternative water sources including recycled water, recycled stormwater, graywater, and desalinated seawater.

Recycled Water

WBMWD developed a regional water recycling program known as the West Basin Water Recycling Project. West Basin's transformation from imported water wholesaler to a leader in conservation and water recycling can be traced back to California's severe drought period between the late '80s and early '90s. In 1992, West Basin received state and federal funding to design and build a world-class, state-of-the-art water recycling treatment facility in the City of El Segundo, equipped with its own visitor's education center.

Figure 2.11: Edward C. Little Recycling Facility

West Basin's water recycling facility, known as the Edward C. Little Water Recycling Facility (ELWRF) receives secondary effluent from the Hyperion Wastewater Treatment Plant. Secondary effluent is pumped from Hyperion to the ELWRF via the Hyperion Secondary Effluent Pump Station (HSEPS), which is owned an maintained by West Basin. The ELWRF

Figure 2.12: Edward C. Little Recycling Facility (ELWRF) in El Segundo, CA

was completed in 1998 and has been expanded several times to meet the increasing needs of the region. The facility currently provides up to 46.8 million gallons per day (mgd) to various customers in WBMWD's service area, including several cities and private industrial customers.The ELWRF is the largest water recycling facility of its kind in the United States and was recognized by the National Water Research Institute in 2002 as one of only six National Centers for Water Treatment Technologies.

The ELWRF is the only treatment facility in the country that produces five different qualities of "designer" or custom-made recycled water that meet the unique needs of West Basin's municipal, commercial and industrial customers. The five types of designer water include: Tertiary Water (Title 22), Nitrified Water, Softened Reverse Osmosis Water, Pure Reverse Osmosis Water, and Ultra-Pure Reverse Osmosis Water. West Basin's customers use recycled water for a wide variety of industrial and irrigation needs. The facility is shown below in **Figure 2.12.**

To meet the increasing needs of its customers and to provide additional supply capacity to the region, WBMWD is proposing the Phase V Expansion of the ELWRF. The proposed project would increase treatment capacity from the existing 46.8 mgd to 72.2 mgd and would include expanding the Title 22 (pretreatment and filtration processes) recycled water system, the microfiltration (MF) treatment system, the reverse osmosis (RO) treatment system and ultraviolet (UV) disinfection treatment systems to meet the proposed increase in capacity, installation of ozone pretreatment process for the MF treatment system, and the upgrade to the support facilities that manage the waste-handling processes and various ancillary process capacities. The initial study and negative declaration for the project was prepared in March 2011.

City Wastewater Collection System

The City does not maintain any wastewater treatment facilities. All wastewater flows from the City (not including storm water) are collected by the City and delivered to the City of Los Angeles Bureau of Sanitation for treatment at the Bureau's Hyperion Treatment Plant. The City sends approximately 6.5 mgd of wastewater to the Hyperion Treatment Plant each year. The Bureau of Sanitation currently operates four treatment plants within the City of Los Angeles' boundaries, and each of the treatment plants produce recycled water. Together, the plants are capable of producing 80 mgd of recycled water.

Current Recycled Water Use

Currently the City benefits from the use of imported water and groundwater and does not use recycled wastewater. However, the City benefits indirectly from regional uses of recycled water in the region.

Potential Uses of Recycled Water

Since the City has not used recycled water, the City has not identified potential recycled water users. If WBMWD and the City were to construct infrastructure then water supplies could include the use of recycled water. The City would benefit from this as a number of parks, schools, medians, and dual-plumbed buildings could use recycled water.

Projected Use of Recycled Water

The projected use of recycled wastewater within the City's service area for the next 25 years is uncertain as funding for infrastructural improvements are needed to distribute recycled water from Hyperion to the City. The City does not expect to use recycled wastewater within the next 25 years but intends to continue using imported water and groundwater along with conservation measures to increase supply reliability.

Future Plans for Recycled Water

Since the closest recycled water pipeline from the Hyperion plant is 15 miles from the City, no current plans exist for the use of recycled water due to engineering and financial issues relating to infrastructure for the distribution and storage of unused recycled water. Recycled water is an additional source of water supply that may be a potential supply in future years, since the City does have rights to the wastewater discharged to the Hyperion Treatment Plant.

Encouraging/Optimizing Recycled Water Use

The City is not currently using recycled water, and thus has not prepared an optimization plan. WBMWD currently engages in marketing efforts and offers financial incentives in its service area to encourage and optimize the use of recycled water by its member agencies. Due to high infrastructure costs, WBMWD does not have any specific plans to construct recycled water infrastructure near the City's service area (due to low potential recycled water use). The City anticipates WBMWD providing recycled water infrastructure only if UCLA were to accept recycled water.

Graywater

Graywater systems have been used in California to provide a source of water supply for subsurface irrigation and also as a means to reduce overall water use. Graywater consists of water discharged from sinks, bathtubs, dishwashers, and clotheswashers. Graywater systems consist of an underground tank and pumping

system. Graywater is currently legal for subsurface irrigation in the State of California. However, strict regulations and high installation costs have impeded installation of professional graywater systems and has the unintended consequence of undocumented and noncompliant use of graywater. With the recent passage of SB 1258, however, graywater use is expected to be expanded to include toilet flushing, and Beverly Hill's Graywater Program incorporates the graywater elements included in the California Green Building Code. Since August 4, 2009, the graywater standards of this statewide code have been in effect in Beverly Hills.

Desalinated Water

Seawater desalination is a process whereby seawater is treated to remove salts and other constituents to develop both potable and non-potable supplies. There are over 10,000 desalination facilities worldwide that produce over 13 million AFY. Desalinated water can add to Southern California's supply reliability by diversifying its water supply sources and mitigating against possible supply reductions due to water shortage conditions. With its Seawater Desalination Program (SDP), the MWD facilitates implementation and provides financial incentives for the development of seawater desalination facilities within its service area.

Currently, WBMWD maintains a temporary ocean-water desalination demonstration plant at SEA Lab in Redondo Beach. The demonstration project uses limited quantities of full-scale equipment to refine operating parameters and perform additional water quality testing, processing 500,000 gallons of ocean water per day. Roughly 250,000 gallons of drinking-quality water will be produced by the demonstration facility on a daily basis. WBMWD anticipates that a full-scale ocean-water desalination facility could produce 20 million gallons daily, enough to meet the needs of 40,000 South Bay households annually.

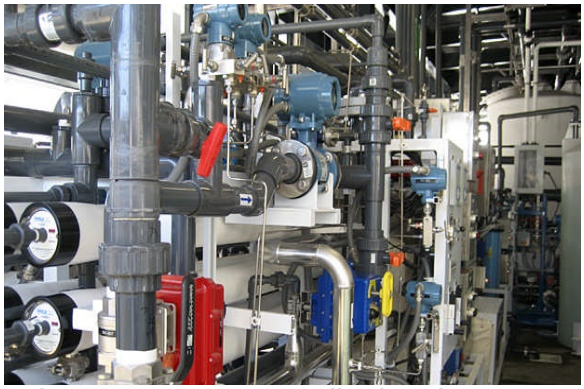

Figure 2.14: WBMWD Desalination Plan

The economics of building and operating an oceanfront desalinization plant would prohibit its construction in the City, as most oceanfront plants are constructed adjacent to existing power plants, and take advantage of the existing discharge. Since the City is not located adjacent to the Ocean, there are no plans to incorporate desalinated seawater into its supply sources.

2.6 TRANSFERS & EXHCHANGES

The City does not currently engage in the transfer or exchange of water with any other agencies other than MWD and LADWP (for emergency purposes). In addition, the City does not engage in transfers or exchanges of groundwater rights with other pumpers in the Hollywood Subbasin since the City is the sole public pumper of groundwater in the Basin.

MWD, however, is currently engaged in exchanges and transfers with agencies that receive water from the SWP and the CRA. These efforts benefit the region by providing additional supply capacity to Southern California through MWD.

SECTION 3: WATER QUALITY

3.1 INTRODUCTION

In 1974, Congress passed the Safe Drinking Water Act in order to protect public health by regulating the nation's drinking water supply. As required by the Safe Drinking Water Act, the City provides annual Water Quality Reports to its customers. The quality of water delivered to the City's customers is directly related to the quality of the supply sources from which the City obtains its water. Since the majority of the City's water supply is obtained from MWD, the quality of water within the City is closely related to the quality of the supply sources form which MWD obtains its water.

To ensure quality of its water, the City is concerned with a number of threats to drinking water which include turbidity, microbiological content, organic and inorganic chemical concentration, radionuclide content, and disinfection by product concentration.

Figure 3.1: Health Standards Protect Drinking Water

Adverse health effects from these contaminants include not only acute effects but also chronic effects that may occur if contaminants are ingested at unsafe levels over many years.

The two main sources of the City's water supply as mentioned in Section 2 are imported water from MWD and groundwater from the West Coast Basin. Since MWD draws the majority of its water from the Colorado River Aqueduct (CRA) and the State Water Project (SWP), the quality of the City's water supply is closely related to the quality of these two sources.

3.2 QUALITY OF SOURCES

Water received by MWD is treated at five separate treatment plants and tests its water for contaminants. Metropolitan recognizes that water quality is a concern to not only public health but also to their future water supply. Due to these concerns, MWD has identified a number of water quality issues with its two main sources in their 2010 Regional Urban Water Management Plan (RUWMP).

In addition to its imported water, the City also manages its groundwater quality by treating all groundwater pumped from the City's four wells at the Reverse Osmosis Treatment Plant. The resulting high quality of water delivered to the City's customers is a result of the efforts of both the City and MWD.

3.3 WATER QUALITY CONCERNS

MWD's two main supply sources have different water quality issues. Water obtained from the Colorado River tends to have high salinity and also has been known to contain harmful metallic elements. Water from the Sacramento-San Joaquin Delta, on the other hand, tends to have high biological

loads due to farming activities in the San Joaquin Valley. Water containing high biological loads tends to have higher treatment costs than water with low biological loads. Since pumping rights to the Colorado River continue to be a debated issue, SWP water quality is an issue of concern. This section describes some of the major water quality issues facing the City

Microbiological Contaminants

Microbiological contaminants include parasites, bacteria, and viruses which live in surface waters and in groundwater. Most microbiological contaminants have acute health effects which include gastrointestinal and respiratory illnesses.

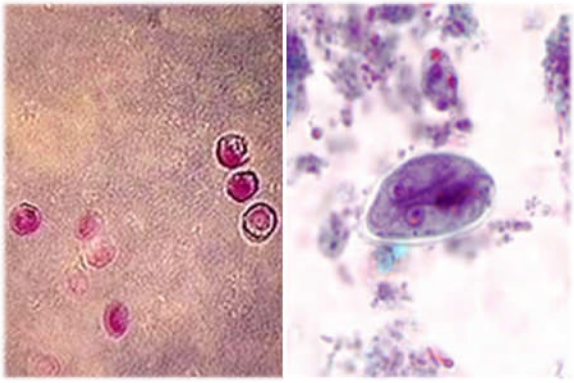

Figure 3.2: Cytosporidium (L) and Giardia (R)

Treatment such as filtration and disinfection removes or destroys microbiological contaminants. Drinking water which is treated to meet EPA requirements is associated with little to no health risks and is considered safe.

Colorado River Contaminants

Salinity

Water imported from the Colorado River via the Colorado River Aqueduct (CRA) has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 630 mg/L. The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. To offset these salinity levels, CRA water must be blended (mixed) with lower-salinity water from the SWP to meet MWD's salinity standard of 500 mg/L for blended imported water.

Figure 3.3 Colorado River and Sedimentary Rock

Concern over salinity levels in the Colorado River has existed for many years. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum).

In 1975, the Forum proposed, the states adopted, and the U. S. Environmental Protection Agency (USEPA) approved water quality standards, including numeric criteria and a plan for controlling salinity increases. The standards require that the plan ensure that the flow-weighted average annual salinity remain at or below the 1972 levels, while the Basin states continue to develop their 1922 Colorado River Compact-apportioned water supply. The Forum selected three stations on the main stream of the lower Colorado River as appropriate points to measure the river's salinity. These

stations and numeric criteria are (1) below Hoover Dam, 723 mg/l; (2) below Parker Dam, 747 mg/l; and (3) at Imperial Dam, 879 mg/l. The numeric criteria are flow-weighted average annual salinity values.

By some estimates, concentrations of salts in the Colorado River cause approximately $353 million in quantified damages in the lower Colorado River Basin each year. To mitigate these issues, salinity control programs have been implemented to reduce the salinity of Colorado River Water. Salinity control programs have proven to be very successful and cost-effective in reducing salinity levels of water in the CRA. Salinity control projects have reduced salinity concentrations of Colorado River water on average by over 100 mg/L or $264 million per year (2005 dollars) in avoided damages.

Perchlorate

Perchlorate is both a naturally occurring and manmade contaminant increasingly found in groundwater, surface water and soil. Perchlorate is known to inhibit the thyroid's ability to produce growth and development hormones. Perchlorate was first detected in Colorado River water in June of 1997 and was traced back to the Las Vegas Wash.

Figure 3.4 Las Vegas Wash

Perchlorate, unlike other contaminants, does not tend to interact readily with the soil and also does not degrade in natural environments. Conventional drinking water treatment (which is used at MWD's water treatment facilities) is not effective in removing perchlorate. Mitigation efforts are the most viable option for removing perchlorate from drinking water. To facilitate perchlorate remediation of the Colorado River, MWD and other federal and state agencies partnered to reduce and prevent perchlorate contamination issues in the Colorado River. In 1998, these mitigation efforts began and have been successful at reducing perchlorate loading into the Las Vegas Wash from 1,000 lbs/day to 60-90 lbs/day since 2007.

Although the California Department of Public Health has established a perchlorate MCL of 6 µg/L, no federal drinking water standard exists. Metropolitan routinely monitors perchlorate at 34 locations within its system and levels currently remain at non-detectable levels (below 2 µg/L). Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

Uranium

Uranium is a naturally occurring radioactive material that has known cancer risks. Uranium can infiltrate a water source either directly or indirectly through groundwater seepage. Due to past uranium mill activities near the Colorado River, a 16-ton pile of uranium mill tailings exists that has the potential for contamination. Ongoing remediation actions have been successful at removing the tailings and contaminated groundwater from the site. Although uranium levels measured at MWD's intake are below State MCL levels, MWD has only limited ability to remove uranium through traditional treatment and thus mitigation methods are crucial to avoiding uranium contamination.

Bay Delta Contaminants

Total Organic Carbon and Bromide

Water containing high levels of Total Organic Carbon and Bromide, once treated with disinfectants such as chlorine or ozone, can lead to the production of Disinfection byproducts (DBPs). DBPs are known to cause certain cancers and pose a significant concern to the City's imported water supply. The EPA currently regulates DBPs with strict standards. MWD manages DBP concentration by participating in the CALFED Bay-Delta Program to safeguard SWP source water and also by providing advanced treatment operations.

Nutrients (Algal Productivity)

Elevated nutrient levels in the SWP can adversely affect the City's imported water quality by stimulating biomass growth such as algae and aquatic weeds. Nutrients can also provide a source of food leading to the growth of nuisance biological species. This can lead to taste and odor concerns and can impede normal treatment operations.

Figure 3.5: Algal Growth in State Water Project

MWD offsets the nutrient rich SWP water by blending it with CRA water in MWD's blend reservoirs. Although nutrient loading is a concern, MWD does not expect there to be any effects on its supplies from the SWP.

Arsenic

Arsenic is a naturally occurring element found in rocks, soil, water, and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water has been linked to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

The MCL for arsenic in domestic water supplies was lowered to 10 µg/L, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. The standard impacts both groundwater and surface water supplies. Historically, Metropolitan's water supplies have had low levels of this contaminant and would not require treatment changes or capital investment to comply with this new standard.

Other Source Water Contaminants

As the technology to discover contaminants advances, the City faces ongoing threats to its drinking water as new contaminants are discovered and existing contaminants are more readily detected. Some of the current contaminants not previously mentioned which pose a threat to the City's imported water supplies include, but are not limited to: Chromium VI, N-nitrosodimethylamine (NDMA), and Pharmaceuticals & Personal Care Products (PPCPs). Continued mitigation efforts may, however, lead to a decrease in the threat level of these contaminants, as has been demonstrated through past mitigation efforts.

Local Water Storage Concerns

Quagga Mussels

For the past three years, quagga mussels have become a significant threat to the water quality of regional storage reservoirs fed by the Colorado River Aqueduct. Since 1989 these mussel infestations have been a nuisance to the Great Lakes Region and have incurred costs of over $5 billon to industries and communities that rely on water from the lakes. It is believed that the mussels first arrived in U.S. waters from foreign ships originating from Eastern Europe. In 2007 they were discovered at various locations along the Colorado River, such as Lake Havasu, and in various local storage reservoirs, such as Lake Matthews. Although the introduction of these species into drinking water supplies does not typically result in violation of drinking water standards, invasive mussel infestations can adversely impact aquatic environments and threaten water delivery systems.

Figure 3.6: Lake Mathews (terminus of CRA)

The quagga mussel is related to the better known zebra mussel which has been plaguing the Great Lakes region. An adult quagga shell measures approximately 0.8 in wide, a size comparable to a thumbnail. The quagga mussel can be found on both hard and soft surfaces in freshwater, from the surface to more than 400 feet in depth.

Quagga mussels can adversely impact water supply systems by clogging filters and pipes used to convey water. In addition, they can also adversely affect water quality by producing unpleasant odor and taste and can eventually render lakes more susceptible to deleterious algal blooms. Algal blooms can lead to the proliferation of nuisance biological species which can further impact the quality of water. Poor water quality can in turn affect the reliability and affordability of water if the problem remains unmitigated.

Figure 3.7: Quagga Mussels On Pipe

Current drinking water and environmental standards limit mitigation options available to MWD and other affected agencies in Southern California. To mitigate problems associated with quagga mussels, MWD developed a Quagga Mussel Control Plan (QMCP), which entails a three phase implementation strategy to mitigate the problems associated with the quagga mussels. Current mitigation efforts include changing the environmental conditions to create antagonistic environments and promoting the use of biological controls. MWD intends to analyze the effectiveness of current mitigation strategies in order to design future infrastructure improvements for the long-term management of quagga mussels.

Summary of Imported Water Quality

Although MWD water meets all regulatory requirements, MWD understands the need for strong testing and quality assurance for its customers. To achieve this, MWD maintains five treatment plants which serve Southern California. Three of the five treatment plants blend a mix of water from both sources to achieve maximum water quality. In state-of the-art laboratory to ensure the safety of its water and to maintain compliance with federal and state water quality regulations. In addition to the central laboratory, there are five satellite facilities at Metropolitan's water treatment plants.

Groundwater Quality Concerns

In addition to imported water quality, the City is also concerned with groundwater quality pumped from the Hollywood Subbasin. Quality of raw water from the Hollywood Subbasin is generally fair and has a total dissolved solid (TDS) concentration ranging from 357 to 970 mg/L. Based on data from the City's four active wells from 2002 to 2006, 85 percent of the samples collected exceeded the secondary standard of 500 mg/L for TDS.

Also of particular concern for the City is arsenic, which has been found in Well No. 4. Arsenic concentrations affect the reliability of the well as occasional shutdowns have been performed when concentrations reach levels of concern.

The City also monitors its pumping for other known groundwater contaminants, such as perchlorate, nitrate, and volatile organic compounds, which have been detected in

Figure 3.8: Water Treatment at MWD's F.E. Weymouth Treatment Plant

local groundwater basins nearby. Fortunately, these contaminants have not been detected in the Hollywood subbasin and the City's groundwater supplies do not require special treatment in order to meet federal and state regulations.

To mitigate high TDS concentrations associated with groundwater quality pumped by City wells, all groundwater pumped from the Hollywood Subbasin is treated at the City's Reverse Osmosis treatment facility to meet or exceed State and Federal Safe Drinking Water standards.

3.4 Water Quality Effects

The previous section discussed water quality issues affecting the City's imported water supply and the City's groundwater supplies pumped from the Hollywood Subbasin. Due to the mitigation actions undertaken by MWD and the City, the City does not anticipate any reductions in its water supplies due to water quality issues. Future regulatory changes enacted by the EPA and/or the State legislature will be met through additional mitigation actions in order to meet the standards and to maintain water supply to the City's customers. Thus, the City does not expect water quality to be a major factor in its supply reliability considerations.

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SECTION 4: WATER DEMANDS

4.1 INTRODUCTION

Water use within the City is variable and depends on a number of factors which range from increases and decreases in irrigation and water losses to changes in plumbing fixtures and customer usage habits. This section explores the water usage trends within the City and quantifies total usage per customer type.

Urbanization's Affect On Water Use

The City of Beverly Hills, like most of Southern California, began as a small suburban town with large, open spaces. Previous land uses in the City at that time consisted of either residential or agricultural uses with some commercial and municipal uses, of which the Beverly Hills Speedway was one example. **Figure 4.1** below shows the City with the Speedway.

Figure 4.1: Beverly Hills in 1923

Through incorporation in 1914 and acquisition of the Beverly Hills Utilities Corporation in 1923, the City paved the way for development and population expansion. The City is currently fully developed with most of the development devoted to urban uses. Some redevelopment throughout the City is projected but is not expected to produce population growth. The City anticipates minimal population growth to occur in the City for the foreseeable future.

Figure 4.2: Beverly Hills Today

Through urbanization, the City has become one of the most popular destinations in Southern California. The City is a major professional job center and also attracts both foreign and domestic tourists with its shopping appeal. As a result, the City's per capita water consumption (water usage measured in gallons per resident or "capita" per day) is among the highest in Southern California at a rate of nearly two times the regional average.

4.2 CURRENT CITY WATER NEEDS

The City's image as a high-end community is due in part to its dedication to its lush, garden-like landscaping both in the private and in the public sector. With over half of the City zoned for low to medium single family dwellings, the City has a significant number of landscapes which require consistent irrigation to maintain those landscapes. This means that hydrologic

conditions will continue to extend a major influence on water use within the City.

Figure 4.3: Irrigation Is Key to City's Landscapes

In addition to water demand for irrigation purposes, many of the City's residents maintain backyard pools which require water for their operation. The use of pools during the summer months places additional demand for water when irrigation demands are already high. A large portion of the City's water is used to water landscapes and to fill pools.

Figure 4.4: Pools Reflect City's Culture

As a result of the City's economic stature, water use within the City's service area is comparatively high to its neighbors within the region. The City of Santa Monica, for instance, distributes approximately the same amount of water annually to its customers but with a population twice the size of the City's service area population. The City's water use will be discussed further in the following sections.

4.3 HISTORIC WATER DEMAND

The City's water demand is met by imported water purchased from MWD and groundwater pumped from the Hollywood Subbasin. The City's annual water use since 2005 has ranged from 11,562 AF in FY 2010 to 14,007 AF in FY 2007. **Table 4.1** below lists the City's water use sine 2005:

Table 4.1
Historic Water Use Since 2005 (AF)

Year	Production (AF)
2010	11,562
2009	12,653
2008	13,453
2007	14,007
2006	13,286
2005	13,280
Average:	**13,040**

As shown in **Table 4.1** above, the City's annual water use has fluctuated since 2005 with a decrease in demand by about 1,700 AFY which represents a 13% drop in total consumption.

4.4 WATER USE STATISTICS

The City maintains records of water consumption and bills its customers on a bi-monthly basis for its water service. The City maintains approximately 11,000 service connections with a mixture of residential, commercial, industrial, and institutional accounts.

Of the 11,000 current service connections, approximately 63 percent are single family residential (SFR) with well over half of the City zoned for low, medium, or

high-density single family dwellings. Commercial, industrial, and institutional (CII) connections, on the other hand, account for approximately 20 percent of the total current service connections. Multi-family residential connections account for 17.5 percent of the total current service connections. The SFR sector accounts for less than half of the City's current water use while CII connections account for approximately 21 percent of the City's current water use as a result of the City's high daytime populations. The water use by each connection type for the past five years and the total number of service connections is listed below in **Tables 4.2** and **4.3**. The average proportions of water use by sector listed in **Table 4.3** will be used to analyze projected water use by sector in **Table 4.7**.

As can be noted from **Table 4.3**, Unaccounted For Water accounts for approximately 8% of the City's overall water use over the past five years. This number has decreased in the past two years as a result of the City's installation of SMART water meters.

Table 4.2
Historic Number of Service Connections

Sector	2006	2007	2008	2009	2010
Single Family Residential	6,966	6,965	6,925	6,935	6,958
Multi-Family Residential	1,955	1,927	1,942	1,907	1,929
Commercial/Institutional/Industrial	2,029	2,131	2,043	2,110	2,118
Other	4	6	5	6	8
Total No. of Connections:	**10,954**	**11,029**	**10,915**	**10,958**	**11,013**

Table 4.3
Historic Demand By Sector (AF)

Sector	2006	2007	2008	2009	2010
Single Family Residential	6,523	7,167	6,787	6,569	5,281
Multi-Family Residential	2,817	2,827	2,718	2,668	2,553
Commercial/Institutional/Industrial	2,669	2,801	2,620	2,583	2,439
Other	0	1	3	5	4
Subtotal :	**12,009**	**12,796**	**12,128**	**11,824**	**10,817**
Unaccounted For Water	1,277	1,211	1,325	829	745
Total Water Use = Total System Supplies (MWD + Ground)	**13,286**	**14,007**	**13,453**	**12,653**	**11,562**
Rainfall Totals (July/June Water Yr.)	**13.19**	**3.21**	**13.53**	**9.08**	**18.1**

*In 2009, the City issued Stage B Water Use Restrictions as part of its Water Conservation Ordinance

4.5 WATER CONSERVATION

SBx7-7 Background

Due to supply concerns in the San Joaquin Delta, the California Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to enforce statewide water conservation. The new legislation called for a 20% reduction in water use by the year 2020. SBx7-7 also amended the water code to call for reporting changes in the 2010 Urban Water Management Plans and allows the Department of Water Resources (DWR) to enforce compliance to the new water use standards. The new reporting requirements allow provisions for agencies located within different Hydrologic Regions to satisfy the requirements of the new legislation. In addition to an overall statewide 20% water use reduction, the objective of SBx7-7 is to reduce water use in each hydrologic region in accordance with the agricultural and urban water needs of each region. Currently, the Department of

Figure 4.5: California's 2020 Water Conservation Goals

Water Resources (DWR) recognizes 10 separate hydrologic regions in California as shown in **Figure 4.5** on the previous page. Each hydrologic region has been established for planning purposes and corresponds to the State's major drainage areas. The City of Beverly Hills is located in the South Coast Hydrologic Region (HR), which includes all of Orange County, most of San Diego and Los Angeles Counties, parts of Riverside, San Bernardino, and Ventura counties, and a small amount of Kern and Santa Barbara Counties. The South Coast HR is shown below in **Figure 4.6.**

Per capita water use, measured in gallons per capita per day (GPCD), in the South Coast HR varies between different water agencies, depending on the geographic and economic conditions of the agency's service area. Regions with more affluence, such as Beverly Hills, typically consume more water and therefore have higher per capita water use numbers.

The South Coast Hydrologic Region has an overall baseline per capita water use of 180 GPCD and DWR has established a regional target of 149 GPCD for the region as a compliance target to satisfy SBx7-7 legislation.

SBx7-7 Methodologies

To satisfy the provisions of SBx7-7, the City must establish a per capita water use target for the year 2020 as well as an interim target. DWR has provided guidelines for determining these targets in its Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use and also in the 2010 UWMP Guidebook (Section D). The City's baseline water use is based on the City's historic water use and is determined by the following procedure:

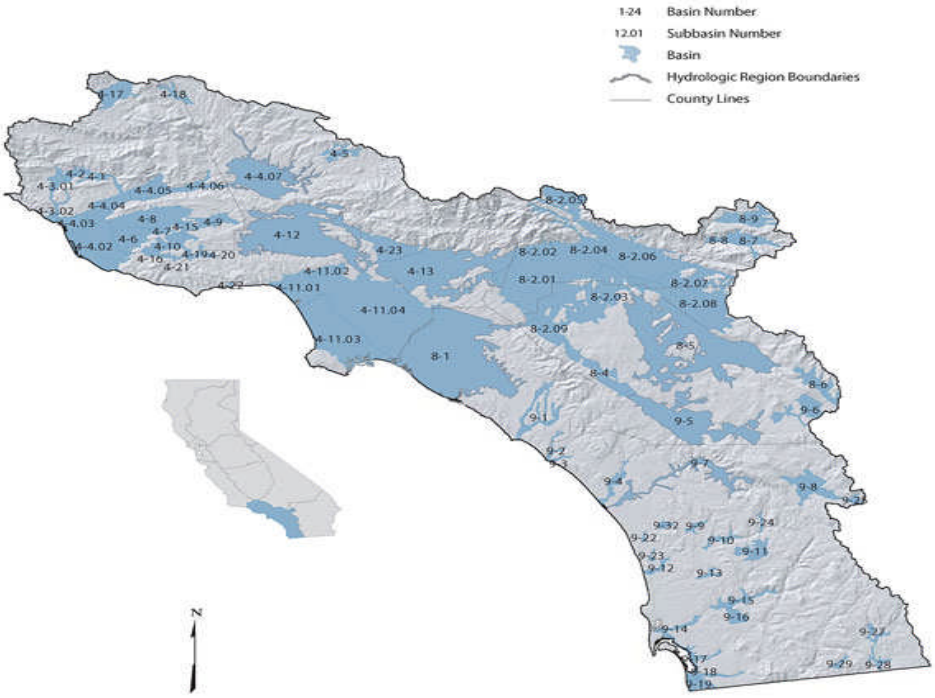

Figure 4.6: South Coast Hydrologic Region

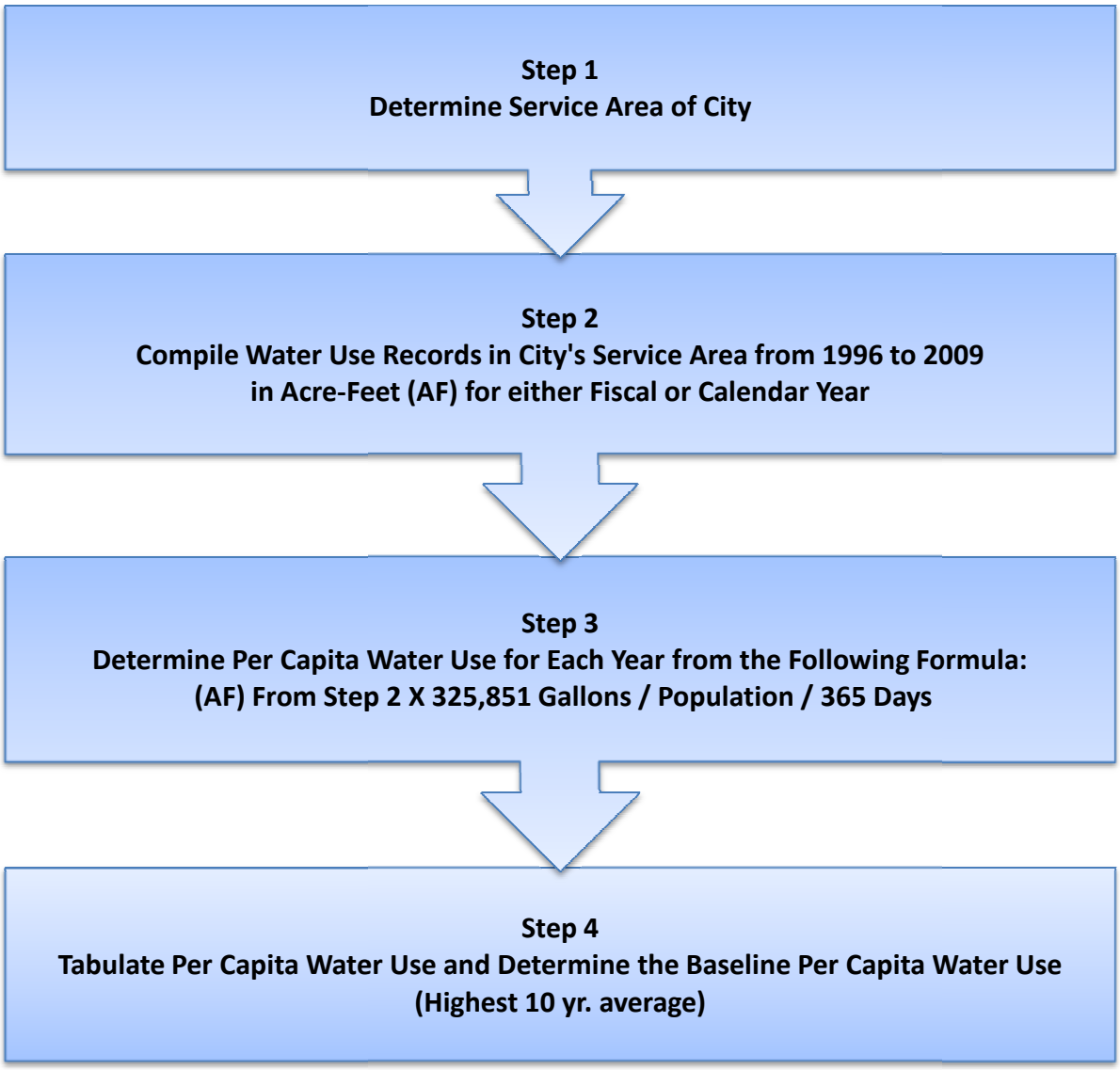

Figure 4.7: Procedure for Determining Baseline Per Capita Water Use

In the same fashion, the City is responsible for determining a five-year baseline water use in accordance with DWR's guidelines. The *Methodologies* guidebook makes provisions which allow a water supplier to meet the target requirements by achieving any one of a number of target requirements, provided that the water supplier's per capita water use is low enough relative to the region within which it supplies water. The basic options include a minimum reduction requirement of 5% (Water Code § 10620), a 5% Reduction from the Regional (South Coast HR) target (Water Code § 10608.20 (b) (3)), or a strict 20% reduction.

These options have been established in order to avoid placing any undue hardship on water agencies that have already been implementing water conservation measures for some time. The basic procedure for determining the applicable water reduction target is illustrated below by **Figure 4.8**:

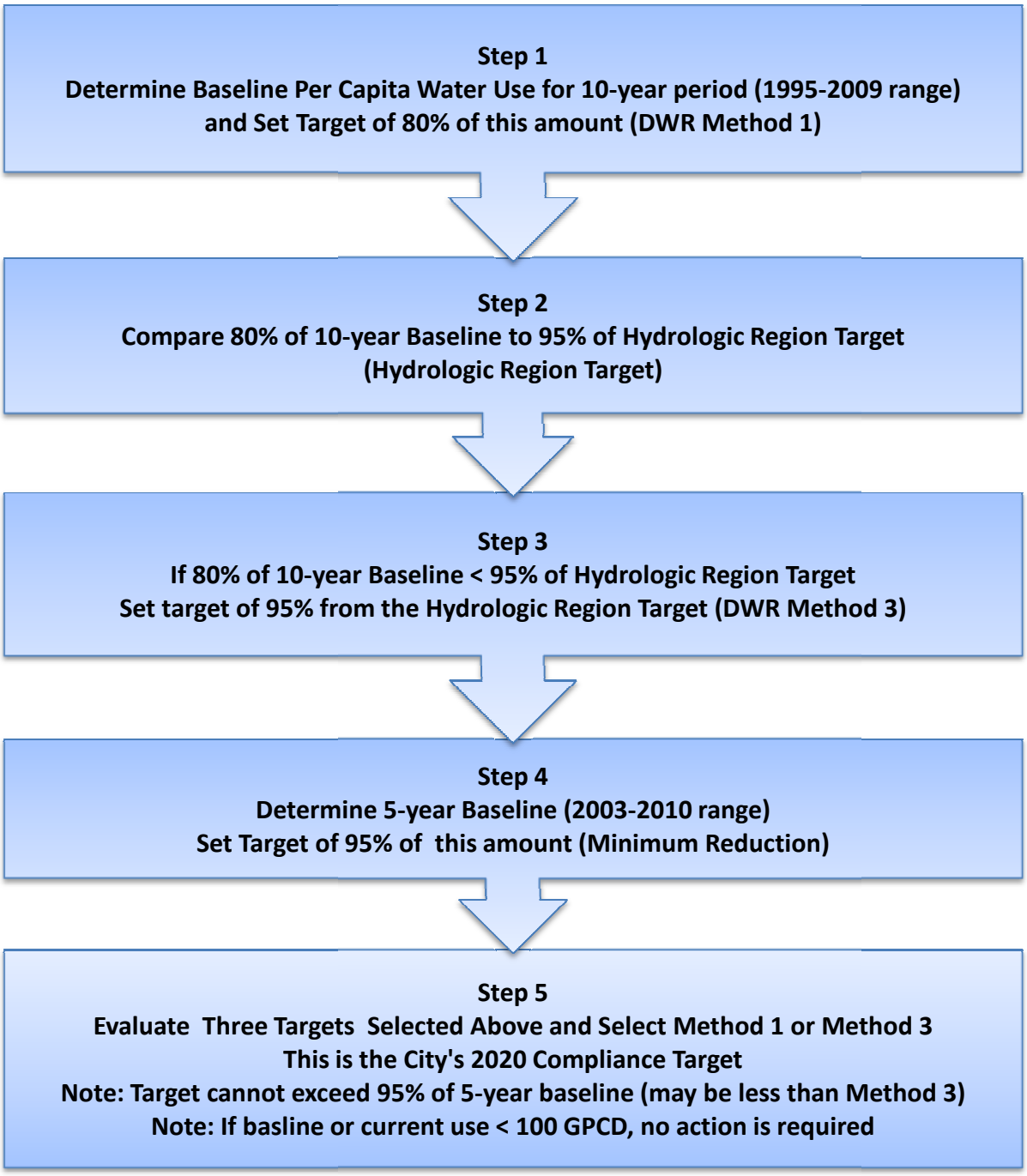

Figure 4.8: Procedure for 2020 Target Per Capita Water Use

If an agency's 10-year baseline is slightly higher than the Hydrologic Region's Target, that agency still must achieve a 5% reduction from its 5-yr. baseline. If an agency has a per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already water efficient.

SBx7-7 Targets

Due to the options available to water

agencies, some neighbor agencies within the South Coast HR with lower baseline water usages, such as Santa Monica, (baseline of 155.7 GPCD) will not have to adhere to stringent reduction requirements. **Table 4.4** below shows an example of these options available to the City of Santa Monica:

Table 4.4
Reduction Example for Santa Monica
(Baseline = 155.7 GPCD)

Min. Reduction Requirement (5% of 5-year baseline) (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
148	125	141.5
	2020 Per Capita Target:	**141.5**
	2015 Interim Target:	**148.6**

As indicated by the above table, the City of Santa Monica cannot select a minimum reduction requirement of 148 GPCD (5% from its baseline) as this amount is greater than 141.5 GPCD (5% reduction from the South Coast HR's regional target). However, since Santa Monica's 20% reduction target (125 GPCD) is less than the minimum reduction requirement that is required by DWR (141.5 GPCD), it is feasible for the City to select 141.5 GPCD as its 2020 water use target.

Unlike the City of Santa Monica, the City of Beverly Hills' water consumption quantities do not reflect conformity to the regional consumption quantities. This indicates that the City's options will be limited within the provisions of SBx7-7.

To determine the City's historic per capita water use and to set 10-yr. and 5-yr. baselines, water use data was gathered from 1996-2009 and the City's baseline was determined as shown below in **Table 4.5:**

Table 4.5
City of Beverly Hills
Historic GPCPD Water Use

Year	Total Consumption (AF)	GPCD
2009	12,653	251
2008	13,453	269
2007	14,007	282
2006	13,286	269
2005	13,280	270
2004	14,042	286
2003	13,583	278
2002	13,598	283
2001	13,598	285
2000	14,093	302
1999	13,545	280
1998	13,139	277
1997	13,659	291
1996	13,368	287
10 yr. Baseline (1996-2005) (SB7: 10608.20)		**284.4**
5 yr. Baseline (2003-2007) (SB7: 10608.22)		**277**
	South Coast HR:	**180**

The baseline numbers shown in the above table will be used to determine the City's compliance target. In order to determine the correct compliance target, the City's baseline water use will be compared to the regional compliance target as in the Santa Monica example in order to determine the applicable reduction amounts per the SBx7-7 additions to the water code.

The legal stipulations applicable to the City and the required target to be enforced by DWR is shown below in **Table 4.6**:

Table 4.6
City of Beverly Hills
2020 Water Use Targets

Min. Reduction Requirement (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
263	228	141.5
	2020 Per Capita Target:	**228**
	2015 Interim Target:	**256**
	2010 Per Capita Water Use:	**228**

As indicated by the above table, the City cannot select a minimum reduction requirement of 263 GPCD (5% from its baseline) as this amount is greater than 141.5 GPCD (5% reduction from the South Coast HR's regional target). Therefore 10608.22 does not apply to the City.

In addition, since the City's 20% reduction target (228 GPCD) far exceeds the South Coast HR's target of 141.5 GPCD, it is feasible for the City to select 228 GPCD as its 2020 water use target. Therefore, the City's compliance target for per capita water consumption is 228 GPCD in accordance with 10608.20(b)(1).

Although the requirements of SBx7-7 seem stringent, it is noteworthy to mention that since becoming a member of CUWCC in 2007, the City has seen an increase in water efficiency throughout its service area from 2008-2010. This is due in part to a greater implementation of water conservation measures.

Methods to Achieve 2020 Water Use Target

Through adherence to strict 20% reduction requirements, the City can participate in Statewide efforts to conserve Sacramento-San Joaquin Bay-Delta Water and to protect the ecological habitat of the region. Although ecological measures can be controversial, ensuring a reliable supply of water for human use is a top priority without controversy. Through conservation measures and the use of renewable, local groundwater supplies, the City can reduce demand for Bay-Delta water.

Figure 4.9: CA Must Preserve Bay-Delta Water

The City understands the unique needs of its customers and also the importance of efficient water use. As a result, the City will utilize management strategies specific to the needs of its residents. The methods to be used in achieving its 2020 reduction requirements, include, but are not limited to the Demand Management Measures listed in **Table 6.1**. In addition, the City may enact additional water use restrictions in accordance with its Emergency Conservation Plan Ordinance as in 2008. With increased public awareness of SBx7-7 requirements, it is likely that the public will begin to understand the importance of water conservation and will begin to use water more efficiently.

4.6 PROJECTED WATER DEMAND

As the City's population increases slightly and as water conservation measures continue to be implemented, the City should experience moderate increases in its water consumption following an overall drop in water use from 2010-2020 due to SBx7-7 requirements.

Future water use projections must consider significant factors on water demand, such as development and/or redevelopment, and climate patterns, among other less significant factors which affect water demand. Although redevelopment is expected to be an ongoing process, it is not expected to significantly impact water use since the City is already in a "built-out" condition. Rainfall, however, will continue to be a major influence on demand as drought conditions will increase demand at a time when these supplies are limited and may therefore result in water use restrictions in accordance with the City's Emergency Conservation Plan Ordinance.

For planning purposes, the City's projected water use for 2015-2035 is broken down by sector in **Table 4.7**. The residential sector includes low-income housing units as the Housing Element for the City of Beverly Hills lists 259 low and very low income housing units to meet the City's Housing Needs Assessment. The estimated residential per unit water demand is 1.2 AF/unit/year and thus 311 acre-feet/year is needed to supply these projected lower income housing units. These water demands are included in future water demand projections for single family and multi-family homes listed in **Table 4.7** below:

Table 4.7
Projected Water Demand By Sector (AF)

Sector	2015	2020	2025	2030	2035
Single Family Residential	5,983	6,051	6,116	6,179	6,239
Multi-Family Residential	2,514	2,542	2,570	2,596	2,621
Commercial/Industrial/Institutional	2,427	2,454	2,481	2,506	2,531
Other	2	2	2	2	3
Subtotal:	**10,926**	**11,049**	**11,169**	**11,284**	**11,394**
Unaccounted For Water	728	737	744	752	759
Total Water Use = Total System Supplies (MWD + Ground)	**11,654**	**11,786**	**11,913**	**12,036**	**12,153**

SECTION 5: RELIABILITY PLANNING

5.1 INTRODUCTION

Drought conditions continue to be a critical issue for Southern California's water supply. As the population of Southern California continues to increase and as environmental regulations restrict imported and local water supplies, it is important that each agency manage its water consumption in the face of drought. Even during times of seasonal drought, each agency ought to anticipate a surplus of supply. This can be accomplished through conservation and supply augmentation, and additionally through prohibitions under penalty of law during times of seasonal or catastrophic shortage in accordance with local ordinances.

This section discusses local and regional efforts to ensure a reliable supply of water and compares projected supply to projected demand. Demand and supply projections are provided in **Tables 5.4- 5.10**.

5.2 HISTORIC DROUGHTS

Climate data has been recorded in California since 1858. Since then, California has experienced several periods of severe drought: 1928-34, 1976-77 and 1987-91, and most recently in 2007-2009. California has also experienced several periods of less than severe drought. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by DWR. These rivers flow into the Delta and are the source of water for the SWP. Southern California sustained few adverse impacts from the 1976-77 drought, but the 1987-91 drought created considerably more concern for Southern California and Los Angeles County.

As a result of previous droughts, the State legislature has enacted, among other things, the Urban Water Management Planning Act, which requires the preparation of this plan. Subsequent amendments to the Act have been made to ensure the plans are responsive to drought management. In 1991. several water agencies came together to form the California Urban Water Conservation Council (CUWCC) to manage the impacts of drought through the promotion of water conservation.

Figure 5.1: Lake Oroville: Drought Conditions

The recent drought of 2007-2009 has resulted in significant impacts on the State's water supplies. The Water Conservation Act of 2009 (SBx7-7) was signed into law by Gov. Schwarzenegger which requires mandatory water conservation up to 20% by 2020.

At the local level, water agencies have enacted their own ordinances to deal with the impacts of drought. In 1992, the City enacted an Emergency Water Conservation Plan Ordinance, which manages the City's water supply during droughts. Compliance ranges from voluntary to mandatory depending on the drought severity.

5.3 REGIONAL SUPPLY RELIABILITY

As a result of continued challenges to its water supplies, MWD understands the importance of reliable water supplies. MWD strives to meet the water needs of Southern California by developing new projects to increase the capacity of its supplies while encouraging its member agencies to develop local supply project to meet the needs of its customers. Also, MWD is committed to developing and maintaining high-capacity storage reservoirs, such as Diamond Valley Lake, to meet the needs of the region during times of drought and emergency.

MWD operates Diamond Valley lake, an 800,000 AF reservoir, to avoid the repercussions of reduced supplies from the SWP and CRA. In addition, MWD operates several additional storage reservoirs in Riverside, San Bernardino, and San Diego Counties to store water obtained from the SWP and the CRA. Storage reservoirs like these are a key component of MWD's supply capability and are crucial to MWD's ability to meet projected demand without having to implement the Water Supply Allocation Plan (WSAP). This is crucial since the SWP and CRA have become more restricted which could render the City's supplies more vulnerable to shortage.

Colorado River Aqueduct Reliability

Water supply from the CRA continues to be a critical issue for Southern California as MWD competes with several agricultural

Figure 5.2: MWD's 800,000 AF Diamond Valley Lake

water agencies in California for unused water rights to the Colorado River. Although California's allocation has been established at 4.4 million acre-feet (MAF) per year, MWD's allotment stands at 550,000 AFY with additional amounts which increase MWD's allotment to 842,000 AFY if there is any unused water from the agricultural agencies.

MWD recognizes that competition from other states and other agencies within California has decreased the CRA's supply reliability. In 2003, the Quantification Settlement Agreement (QSA) was signed which facilitated the transfer of water from agricultural agencies to urban uses.

State Water Project Reliability

The reliability of the SWP impacts Metropolitan's member agencies' ability to plan for future growth and supply. DWR's Bulletin 132-03, December 2004, provides certain SWP reliability information, and in 2002, the DWR Bay-Delta Office prepared a report specifically addressing the reliability of the SWP. This report, The State Water Project Delivery Reliability Report, provides information on the reliability of the SWP to deliver water to its contractors assuming historical precipitation patterns.

On an annual basis, each of the 29 SWP contractors, including Metropolitan, request an amount of SWP water based on their anticipated yearly demand. In most cases, Metropolitan's requested supply is equivalent to its full "Table A" amount (a table indicating annual allocations to SWP contractors). After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, the SWP annual delivery of water to contractors has ranged from 552,600 AFY in 1991 to 3.5 MAF in 2000. Due to the uncertainty in water supply, contractors are not typically guaranteed their full "Table A" Amount, but instead a percentage of that amount based on the available supply.

Each December, DWR provides the contractors with their first estimate of allocation for the following year. As conditions develop throughout the year, DWR revises the allocations.

Figure 5.3: State Water Project (SWP)

Due to the variability in supply for any given year, it is important to understand the reliability of the SWP to supply a specific amount of water each year to the contractors.

Current Reservoir Levels

Statewide, storage reservoir levels rise and fall due to seasonal climate changes. During periods of drought, reservoir levels can drop significantly and can limit the amount of supplies available. As a result, both DWR and MWD monitor their reservoir levels regularly. In 2009, conditions of several key reservoirs indicated drought conditions. Currently, reservoir levels are high as indicated by **Figures 5.4** and **5.5**:

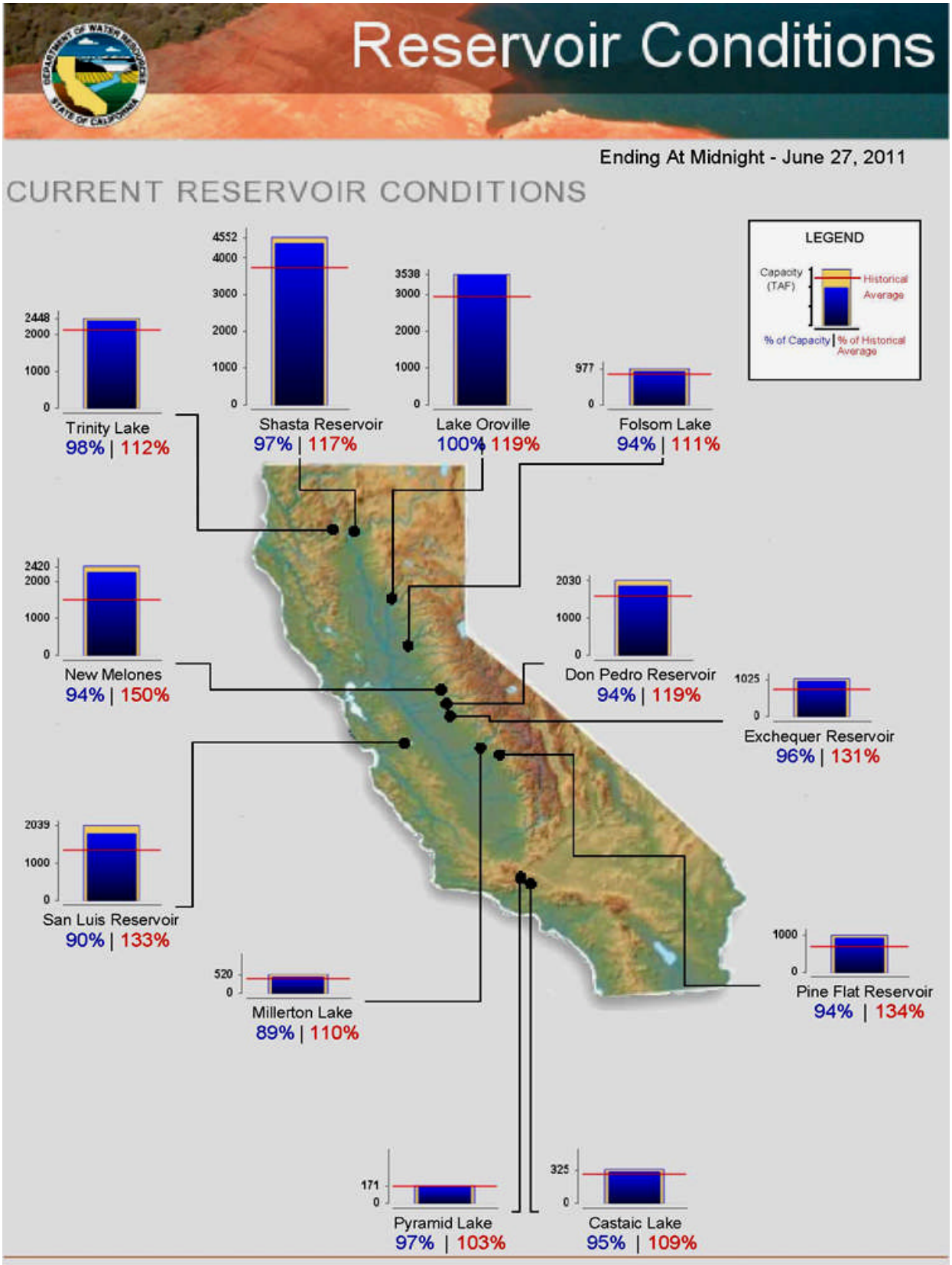

Figure 5.4: California State Reservoir Levels

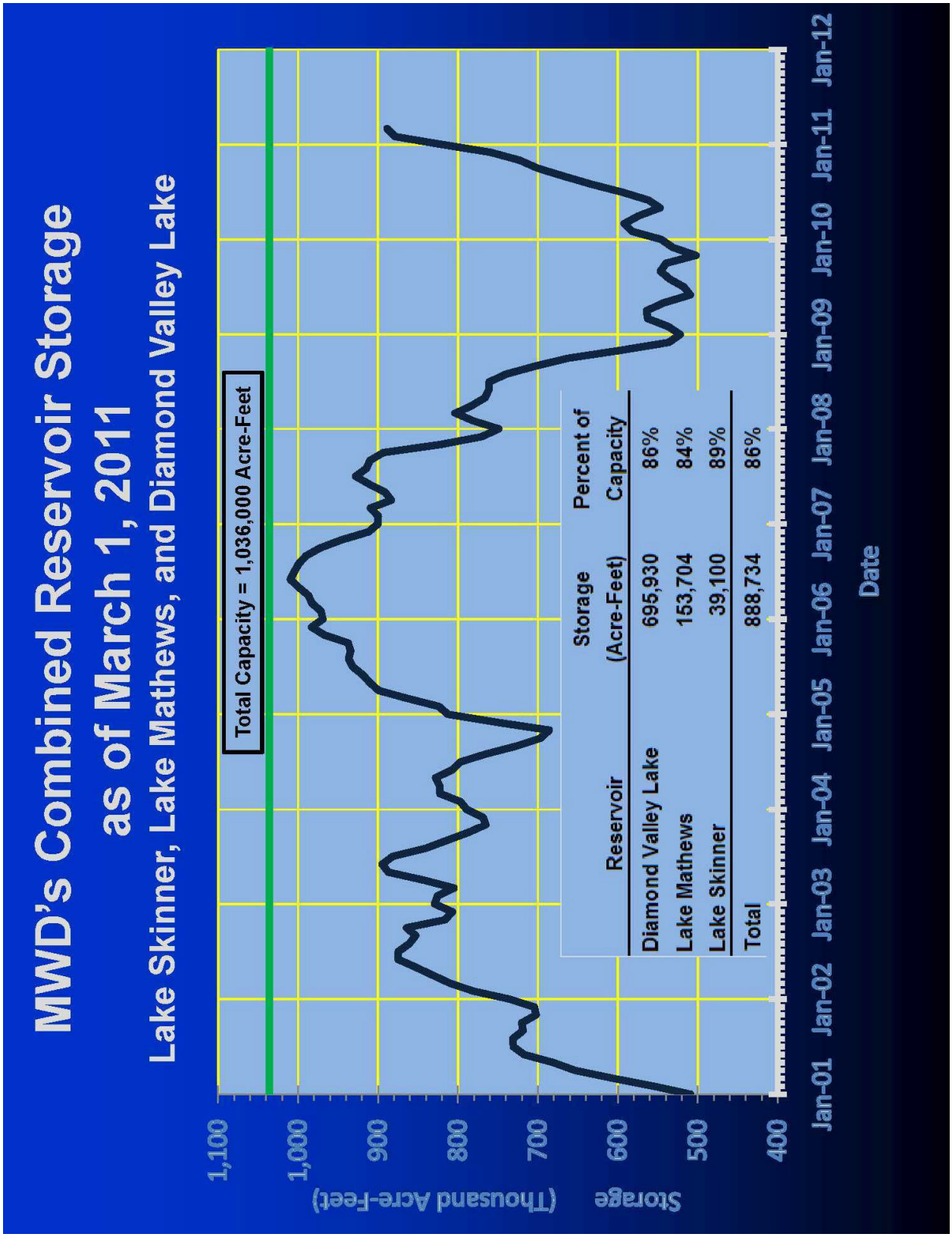

Figure 5.5: MWD Reservoir Levels

5.4 SUPPLY VS. DEMAND

As the City relies on imported water & local groundwater supplies, the City's water supply reliability is based on the capacity and vulnerability of its infrastructure in addition to the seasonal demand changes brought about by periods of drought. In particular, MWD's reliability of supply has direct impact on the City. Population growth will also continue to be a consideration in future reliability projections. Since the City is pursuing additional groundwater capacity in the near future, having continued access to imported water increases the City's supply reliability.

Regional Supply Reliability

Southern California is expected to experience an increase in regional demands in the years 2015 through 2035 as a result of population growth. Although increases in demand are expected, they are limited due to the requirements of SBx7-7 which provides a cap on water consumption rates (i.e. per capita water use). It can be reasonably expected that the majority of agencies will be at or near their compliance targets by 2020 and thereafter as conservation measures are more effectively enforced.

Tables 2.9-2.11 of MWD's 2010 Regional Urban Water Management Plan (RUWMP) shows supply reliability projections for average and single dry years through the year 2035. The data in these tables is important to effectively project and analyze supply and demand over the next 25 years for many regional agencies. It is noteworthy that Projected Supplies During a Single Dry Year and Multiple Dry Years indicates MWD's projected supply will exceed its projected single dry year and multiple dry year demands in all years. Likewise, for average years, MWD supply exceeds projected demands for all years. The data contained in these tables has an indirect effect on the City's imported supply capacity and thus this data will also be used to develop the City's projected supply and demand over the next 25 years. **Tables 5.2** and **5.3** show MWD's supply reliability.

City Supply Reliability

To project future supply and demand comparisons, it will be assumed that demand will increase annually based on population growth and a constant of 228 GPCD in accordance with SBx7-7 requirements. **Table 5.1** contains the projected populations that will be used to project demand:

Table 5.1
Beverly Hills Water Service Area
Projected Populations

Year	Population
2015	45,632
2020	46,148
2025	46,646
2030	47,126
2035	47,587

During times of drought, demand will increase at a time when supply will decrease. To project demands during drought periods, the following increase factors will be assumed:

- **Single Dry Year Demand Increase**: Based on Table 5.2 Row F
- **Multiple Dry Year Demand Increases (Years 1, 2, & 3)**: Based on Table 5.3 Row F

Table 5.2
MWD Regional Imported Water Supply Reliability Projections
Average and Single Dry Years

Row	Region Wide Projections	2015	2020	2025	2030	2035
Supply Information (AF)						
A	Projected Supply During an Average Year (AF)	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
B	Projected Supply During a Single Dry Year (AF)	2,.457,000	2,782,000	2,977,000	2,823,000	2,690,000
C = A/B	Projected Supply During a Single Dry Year as a % of Average Supply	**141.8**	**137.0**	**137.4**	**139.8**	**141.8**
Demand Information (AF)						
D	Projected Demand During an Average Year (AF)	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
E	Projected Demand During a Single Dry Year (AF)	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
F = E/D	Projected Demand During a Single Dry Year as a % of Average Demand	**108.2**	**111.8**	**110.9**	**110.0**	**110.1**
Surplus Information (AF)						
G = A-D	Projected Surplus During an Average Year (AF)	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
H = B-E	Projected Surplus During a Single Dry Year (AF)	286,000	620,000	776,000	569,000	371,000
Additional Supply Information						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	**173.7**	**197.1**	**206.0**	**192.6**	**181.1**
J = A/E	Projected Supply During an Average Year as a % of Demand During Single Dry Year	**160.5**	**176.2**	**185.8**	**175.1**	**164.5**
K = B/E	Projected Supply During a Single Dry Year as a % of Single Dry Year Demand (including surplus)	**113.2**	**128.7**	**135.3**	**125.2**	**116.0**

Table 5.3
MWD Regional Imported Water Supply Reliability Projections
Average and Multiple Dry Years

Row	Region Wide Projections	2015	2020	2025	2030	2035
Supply Information (AF)						
A	Projected Supply During an Average Year (AF)	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
B	Projected Supply During Multiple Dry Year Period (AF)	2,248,000	2,417,000	2,520,000	2,459,000	2,415,000
C = B/A	Projected Supply During Multiple Dry Year as a % of Average Supply	**64.5**	**63.4**	**61.6**	**62.3**	**63.3**
Demand Information (AF)						
D	Projected Demand During an Average Year (AF)	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
E	Projected Demand During Multiple Dry Year Period (AF)	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
F = E/D	Projected Demand During Multiple Dry Year Period as a % of Average Demand	**111.5**	**113.2**	**115.0**	**114.2**	**113.9**
Surplus Information (AF)						
G = A-D	Projected Surplus During an Average Year (AF)	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
H = B-E	Projected Surplus During Multiple Dry Year Period (AF)	12,000	229,000	237,000	120,000	16,000
Additional Supply Information						
I = A/D	Projected Supply During an Average Year as a % of Demand During an Average Year	**173.7**	**197.1**	**206.0**	**192.6**	**181.1**
J = A/E	Projected Supply During an Average Year as a % of Demand During Multiple Dry Year	**155.9**	**174.1**	**179.1**	**168.7**	**159.0**
K = B/E	Projected Supply During a Multiple Dry Year as a % of Multiple Dry Year Demand (including surplus)	**100.5**	**110.5**	**110.4**	**105.1**	**100.7**

Table 5.4
City of Beverly Hills Water Supply Availability & Demand Projections
Normal Water Year

Water Sources	2015	2020	2025	2030	2035
Available Supply (AF)					
Imported Water	18,853	21,653	22,893	21,641	20,560
Groundwater	800	800	800	800	800
Total Supply	**19,653**	**22,453**	**23,693**	**22,441**	**21,360**
% of Normal Year	100%	100%	100%	100%	100%
Demand (AF)					
Imported Water	10,854	10,986	11,113	11,236	11,353
Groundwater	800	800	800	800	800
Total Demand	**11,654**	**11,786**	**11,913**	**12,036**	**12,153**
% of 2005-2009 Avg. Demand	89%	90%	91%	92%	93%
Supply/Demand Comparison					
Supply/ Demand Difference	7,999	10,667	11,780	10,405	9,207
Difference as % of Supply	41%	48%	50%	46%	43%
Difference as % of Demand	69%	91%	99%	86%	76%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections

2. Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.2 Row I

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years.

Table 5.5
City of Beverly Hills Water Supply Availability & Demand Projections
Single Dry Year

Water Sources	2015	2020	2025	2030	2035
Available Supply (AF)					
Imported Water	13,368	15,929	16,793	15,574	14,593
Groundwater	800	800	800	800	800
Total Supply	**14,168**	**16,729**	**17,593**	**16,374**	**15,393**
Normal Year Supply	19,653	22,453	23,693	22,441	21,360
% of Normal Year	72%	75%	74%	73%	72%
Demand (AF)					
Imported Water	11,810	12,377	12,412	12,440	12,580
Groundwater	800	800	800	800	800
Total Demand	**12,610**	**13,177**	**13,212**	**13,240**	**13,380**
Normal Year Demand	11,654	11,786	11,913	12,036	12,153
% of Normal Year	108.2%	111.8%	110.9%	110.0%	110.1%
Supply/Demand Comparison					
Supply/Demand Difference	1,559	3,552	4,381	3,135	2,013
Difference as % of Supply	11%	21%	25%	19%	13%
Difference as % of Demand	12%	27%	33%	24%	15%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections and a single dry-year increase of 108.2% to 111.8% in accordance with Table 5.2 Row F

2. Single Dry Year Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.2 Row K

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years.

Table 5.6
City of Beverly Hills Water Supply Availability & Demand Projections
Multiple Dry Years (2011-2015)

Water Sources	2011	2012	2013	2014	2015
Available Supply (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	20,010	19,721	12,628	12,442	12,255
Groundwater	800	800	800	800	800
Total Supply	**20,810**	**20,521**	**13,428**	**13,242**	**13,055**
Normal Year Supply	20,810	20,521	20,232	19,943	19,653
% of Normal Year	100%	100%	66.4%	66.4%	66.4%
Demand (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	11,520	11,354	12,566	12,380	12,194
Groundwater	800	800	800	800	800
Total Demand	**12,320**	**12,154**	**13,366**	**13,180**	**12,994**
Normal Year Demand	12,320	12,154	11,987	11,821	11,654
% of Normal Year	100%	100%	111.5%	111.5%	111.5%
Supply/Demand Comparison					
Comparison	**Normal Years**		**Multiple Dry Years**		
Projected Surplus	8,490	8,368	63	62	61
Difference as % of Supply	41%	41%	0.5%	0.5%	0.5%
Difference as % of Demand	69%	69%	0.5%	0.5%	0.5%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections and a multiple dry-year increase of 111.5% in accordance with Table 5.3 Row F (years prior to 2015 = 2015 increase of 111.5%)

2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.3 Row K

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years.

Table 5.7
City of Beverly Hills Water Supply Availability & Demand Projections
Multiple Dry Years (2016-2020)

Water Sources	2016	2017	2018	2019	2020
Available Supply (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	23,702	23,190	14,509	14,184	13,859
Groundwater	800	800	800	800	800
Total Supply	**24,502**	**23,990**	**15,309**	**14,984**	**14,659**
Normal Year Supply	24,502	23,990	23,478	22,965	22,453
% of Normal Year	100%	100%	65%	65%	65%
Demand (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	12,025	11,765	13,130	12,836	12,542
Groundwater	800	800	800	800	800
Total Demand	**12,825**	**12,565**	**13,930**	**13,636**	**13,342**
Normal Year Demand	12,825	12,565	12,306	12,046	11,786
% of Normal Year	100%	100%	113.2%	113.2%	113.2%
Supply/Demand Comparison					
Comparison	**Normal Years**		**Multiple Dry Years**		
Supply/Demand Difference	11,676	11,424	1,379	1,348	1,317
Difference as % of Supply	48%	48%	9.0%	9.0%	9.0%
Difference as % of Demand	91%	91%	9.9%	9.9%	9.9%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections and a multiple dry-year increase of 113.2% in accordance with Table 5.3 Row F (years prior to 2020 = 2020 increase of 113.2%)

2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.3 Row K

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years

Table 5.8
City of Beverly Hills Water Supply Availability & Demand Projections
Multiple Dry Years (2021-2025)

Water Sources	2021	2022	2023	2024	2025
Available Supply (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	22,683	22,736	14,177	14,209	14,242
Groundwater	800	800	800	800	800
Total Supply	**23,483**	**23,536**	**14,977**	**15,009**	**15,042**
Normal Year Supply	23,483	23,536	23,588	23,640	23,693
% of Normal Year	100%	100%	63%	63%	63%
Demand (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	11,011	11,037	12,842	12,871	12,900
Groundwater	800	800	800	800	800
Total Demand	**11,811**	**11,837**	**13,642**	**13,671**	**13,700**
Normal Year Demand	11,811	11,837	11,862	11,888	11,913
% of Normal Year	100%	100%	115.0%	115.0%	115.0%
Supply/Demand Comparison					
Comparison	**Normal Years**		**Multiple Dry Years**		
Supply/Demand Difference	11,672	11,699	1,336	1,339	1,342
Difference as % of Supply	50%	50%	8.9%	8.9%	8.9%
Difference as % of Demand	99%	99%	9.8%	9.8%	9.8%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections and a multiple dry-year increase of 115.0% in accordance with Table 5.3 Row F (years prior to 2025 = 2025 increase of 115.0%)

2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.3 Row K

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years

Table 5.9
City of Beverly Hills Water Supply Availability & Demand Projections
Multiple Dry Years (2026-2030)

Water Sources	2026	2027	2028	2029	2030
Available Supply (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	21,451	21,498	13,546	13,576	13,605
Groundwater	800	800	800	800	800
Total Supply	**22,251**	**22,298**	**14,346**	**14,376**	**14,405**
Normal Year Supply	22,251	22,298	22,346	22,393	22,441
% of Normal Year	100%	100%	64%	64%	64%
Demand (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	11,138	11,162	12,889	12,917	12,945
Groundwater	800	800	800	800	800
Total Demand	**11,938**	**11,962**	**13,689**	**13,717**	**13,745**
Normal Year Demand	11,938	11,962	11,987	12,011	12,036
% of Normal Year	100%	100%	114.2%	114.2%	114.2%
Supply/Demand Comparison					
Comparison	**Normal Years**		**Multiple Dry Years**		
Supply/Demand Difference	10,313	10,336	657	659	660
Difference as % of Supply	46%	46%	4.6%	4.6%	4.6%
Difference as % of Demand	86%	86%	4.8%	4.8%	4.8%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections and a multiple dry-year increase of 114.2% in accordance with Table 5.3 Row F (years prior to 2030 = 2030 increase of 114.2%)

2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.3 Row K

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years

Table 5.10
City of Beverly Hills Water Supply Availability & Demand Projections
Multiple Dry Years (2031-2035)

Water Sources	2031	2032	2033	2034	2035
Available Supply (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	20,391	20,433	13,080	13,107	13,134
Groundwater	800	800	800	800	800
Total Supply	**21,191**	**21,233**	**13,880**	**13,907**	**13,934**
Normal Year Supply	21,191	21,233	21,276	21,318	21,360
% of Normal Year	100%	100%	65%	65%	65%
Demand (AF)					
Source	**Normal Years**		**Multiple Dry Years**		
Imported Water	11,259	11,283	12,989	13,016	13,042
Groundwater	800	800	800	800	800
Total Demand	**12,059**	**12,083**	**13,789**	**13,816**	**13,842**
Normal Year Demand	12,059	12,083	12,106	12,130	12,153
% of Normal Year	100%	100%	113.9%	113.9%	113.9%
Supply/Demand Comparison					
Comparison	**Normal Years**		**Multiple Dry Years**		
Supply/Demand Difference	9,131	9,150	91	91	91
Difference as % of Supply	43%	43%	0.7%	0.7%	0.7%
Difference as % of Demand	76%	76%	0.7%	0.7%	0.7%

Table is intended only to show City will be able to meet demand for all years per the following*:

1. Total Demand based on 228 GPCD (SBx7-7) multiplied by population projections and a multiple dry-year increase of 113.9% in accordance with Table 5.3 Row F (years prior to 2035 = 2035 increase of 113.9%)

2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.3 Row K

3. Groundwater Supply/Demand based on a conservative estimate of 800 AFY by panel of City's geologists

*This Table not intended to be a projection of City's actual groundwater production. City can and may pump amounts different than 800 AFY.

*This Table is not intended to be a projection of City's actual demand. Demand of 228 based on SBx7-7 limits. Actual demand is likely to trend towards greater efficiency than SBx7-7 in future years

Based on the data contained in **Tables 5.4-5.10**, it is estimated that the City would need to import about 13,790 AF of water in year 2015 assuming it is a multiple dry year. Although this multiple dry year demand is slightly above the City's Tier 1 limit of 13,380 AF, it is considerably less than their preferential right of 22,705 AF under the same conditions. The City can expect to meet future demands through 2035 for all climatologic conditions. Reliability of groundwater and imported water supply capacities are not expected to be significantly affected during times of low rainfall and over short term dry periods of up to three years. However, during prolonged periods of drought, the City's imported water supply capacities may potentially be reduced significantly due to reductions in MWD's storage reservoirs resulting from increases in regional demand.

5.5 VULNERABILITY OF SUPPLY

As mentioned previously, the City of Beverly Hills is located in a semi-arid environment. The area must depend on imported surface water supplies since precipitation is limited and thus natural groundwater replenishment is inadequate. Climate data in California has been recorded since the year 1858 and the State has experienced several drought periods of different severity.

Due to the semi-arid nature of the area and seasonally hot summer months, the City is vulnerable to water shortages. While the data shown in **Tables 5.4** through **5.10** identifies water availability during single and multiple dry year scenarios, response to a future drought would follow the water use efficiency mandates of the City's Emergency Conservation Plan Ordinance. These programs are discussed in Section 7.

5.6 WATER SUPPLY OPPORTUNITIES

City Projects

The City continually reviews practices that will provide its customers with adequate and reliable supplies. The City projects water demands within its service area to remain fairly constant over the next 20 years due to minimal growth combined with water use efficiency measures.

Due to this fact, the City does not have current plans for additional water supply projects other than regular maintenance and upgrades to its existing wells, storage reservoirs, and distribution pipelines.

Regional Projects (MWD)

MWD is implementing water supply alternative strategies for the region to ensure available water in the future. Some of these strategies include:

- Conservation
- Water recycling & groundwater recovery
- Storage/groundwater management programs within the region
- Storage programs related to the SWP and the Colorado River
- Other water supply management programs outside of the region

MWD has made investments in conservation and supply augmentation as part of its long-term water management strategy. MWD's approach to a long-term water management strategy was to develop an Integrated Resource Plan (IRP) to include many supply sources. A brief description of the various programs implemented by MWD to improve reliability is included **Table 5.11** on the following page:

Table 5.11
MWD IRP 2010 Regional Resources Status

Supply	Description	
Colorado River Aqueduct (CRA)	Metropolitan holds a basic apportionment of Colorado River water and has priority for an additional amount depending on availability of surplus supplies. Water management programs supplement these apportionments.	
State Water Project (SWP)	Metropolitan receives water delivered under State Water Contract provisions, including Table A contract supplies, use of carryover storage in San Luis Reservoir, and Article 21 interruptible supplies.	
Conservation	Metropolitan and the member agencies sponsor numerous conservation programs in the region that involve research and development, incentives, and consumer behavior modification.	
	Code-Based Conservation	Water savings resulting from plumbing codes and other institutionalized water efficiency measures.
	Active Conservation	Water saved as a direct result of programs and practices directly funded by a water utility, e.g., measures outlined by the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs). Water savings from active conservation completed through 2008 will decline to zero as the lifetime of those devices is reached. This will be offset by an increase in water savings for those devices that are mandated by law, plumbing codes or other efficiency standards.
	Price Effect Conservation	Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water.
Local Resources	*Groundwater*	Member-agency produced groundwater from the groundwater basins within the service area.
	Groundwater Recovery	Locally developed and operated, groundwater recovery projects treat contaminated groundwater to meet potable use standards. Metropolitan offers financial incentives to local and member agencies through its Local Resources Program for recycled water and groundwater recovery. Details of the local resources programs are provided in **Appendix A.6**.
	Los Angeles Aqueduct (LAA)	A major source of imported water is conveyed from the Owens Valley via the LAA by Los Angeles Department of Water and Power (LADWP). Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled by a local agency.
	Recycling	Recycled water projects recycle wastewater for M&I use.
	Surface Water	Surface water used by member agencies comes from stream diversions and rainwater captured in reservoirs.
Groundwater Conjunctive Use Storage Programs	Metropolitan sponsors various groundwater storage programs, including, cyclic storage programs, long-term replenishment storage programs, and contractual conjunctive use programs. Details of the groundwater storage programs are provided in **Appendix A.4**.	
Surface Water Storage	Metropolitan reservoirs (Diamond Valley Lake, Lake Mathews, Lake Skinner) and flexible storage in California Department of Water Resources (DWR) reservoirs (Castaic Lake, Lake Perris). Details of the surface storage reservoirs are provided in **Appendix A.5**.	
Central Valley Storage & Transfers	Central Valley storage programs consist of partnerships with Central Valley water districts to allow Metropolitan to store SWP supplies in wetter years for return in drier years. Metropolitan's Central Valley transfer programs consist of partnerships with Central Valley Project and SWP settlement contractors to allow Metropolitan to purchase water in drier years. Details of the Central Valley Storage and Transfer programs are provided in **Appendix A.3**.	

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SECTION 6: CONSERVATION MEASURES

6.1 INTRODUCTION

As a result of diminished existing supplies and difficulty in developing new supplies, water conservation is important to Southern California's sustainability. Therefore, the City acknowledges that efficient water use is the foundation of its current and future water planning and operations policies.

To conserve California's water resources, several public water agencies, and other interested parties of the California Urban Water Conservation Council (CUWCC) drafted the Memorandum of Understanding Regarding Urban Water Conservation (MOU) in 1991. The MOU establishes 14 Best Management Practices (BMPs) which are defined roughly as policies, programs, practices, rules, regulations, or ordinances that result in the more efficient use or conservation of water.

The 14 BMPs coincide with the 14 Demand Management Measures (DMMs) defined in the UWMP Act. The BMPs are intended to reduce long-term urban demands from what they would have been without their implementation and are in addition to programs which may be instituted during occasional water supply shortages.

6.2 CUWCC MEMBERSHIP

In 2004, the City became a signatory of the CUWCC by signing the MOU and has expedited implementation of water conservation measures. CUWCC members implement all 14 of the measures with good faith effort by achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in each BMP's definition as described in the MOU. Water conservation is an integral part of the City's water policies.

Figure 6.1: Water Waste is Prohibited by City Code

As a member of CUWCC, the City is required to submit Annual Reports to the CUWCC which document the implementation of each BMP. As a result, the City acts with good faith effort to maintain compliance with all the BMPs since becoming a signatory.

6.3 CONSERVATION MEASURES

As signatory to the MOU, the City has committed to use good-faith efforts to implement the 14 Demand Management Measures. In addition, the city has continued to work with the Metropolitan Water District to increase the effectiveness of its DMM programs and educate children on the importance of water conservation.

Overall, the city's conservation efforts as a member of CUWCC have led to efficient water use. These measurements have been updated to include the most recent data and implementation schedule for the DMM's. The city's 14 DMM's are summarized in **Table 6.1** on the following page:

Table 6.1
City Demand Management Measures
(CUWCC Best Management Practices)

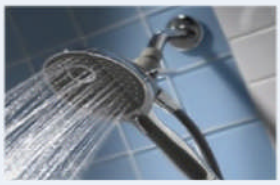
Demand Management Measure		Description
DMM No. 1: Water Survey Programs for Single and Multi-Family Residential Customers		The City's water surveys are aimed at developing residential customer water use efficiency for both landscape and indoor water use.
DMM No. 2: Residential Plumbing Retrofit		The City's residential plumbing retrofit programs involve providing customers with water efficient plumbing devices such as low-flow showerheads.
DMM No. 3: System Water Audits, Leak Detection, and Repair		Conducted by water operations/maintenance staff, these programs aim at reducing water losses through a water agency's mains.
DMM No. 4: Metering With Commodity Rates		Providing water meters and charging for service is a key component to the City's water conservation policies.
DMM No. 5: Large Landscape Conservation Programs and Incentives		Smart timers and drip irrigation systems are among the devices used in the City to achieve landscape water use efficiency.
DMM No. 6: High-Efficiency Washing Machine Rebate Programs		Through this program, the City's customers can receive a rebate towards the purchase of a high-efficiency washing machine.
DMM No. 7: Public Information Programs	CALIFORNIA WATER AWARENESS CAMPAIGN	These programs provides the public information to promote water conservation and water conservation-related benefits.

Table 6.1 (cont.)
City Demand Management Measures
(CUWCC Best Management Practices)

Demand Management Measure		Description
DMM No. 8: School Education Programs		The City partners with MWD to provide children an opportunity learn the importance of water conservation
DMM No. 9: Conservation Programs for Comm./Indust./Institutional Accounts		Through this program, the City assists water using establishments in upgrading their plumbing devices.
DMM No. 10: Wholesale Agency Programs		Through this program, MWD provides the City with resources to advance water conservation efforts and effectiveness
DMM No. 11: Conservation Pricing		Through this program, the City provides economic incentives to customers to use water efficiently.
DMM No. 12: Water Conservation Coordinator		Through this program, the City establishes a conservation coordinator who oversees the City's water conservation measures.
DMM No. 13: Water Waste Prohibition		The City has ordinances in place which prohibit the waste of water and penalizes wasteful water use.
DMM No. 14: Residential Ultra Low Flush Toilet Replacement Program		Through this program, the City assists customers in replacing their existing toilets with water efficient models.

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SECTION 7: CONTINGENCY PLANNING

7.1 INTRODUCTION

Water supplies may be interrupted or reduced by droughts, earthquakes, and power outages which hinder a water agencies ability to effectively delivery water. Drought impacts increase with the length of a drought, as supplies in reservoirs are depleted and water levels in groundwater basins decline. The ability to manage water supplies in times of drought or other emergencies is an important part of water resources management for a community.

Figure 7.1: Emergency Water After Japan Quake

The City's response to an emergency will be a coordinated effort of its own staff in conjunction with other local and regional water agencies. During water shortage emergencies, the City will implement its Emergency Conservation Plan Ordinance to conserve supplies. The objectives of the City's response plan are to:

1. Prioritize essential uses of available water
2. Avoid irretrievable loss of natural resources
3. Manage current water supplies to meet ongoing and future needs
4. Maximize local municipal water supplies
5. Eliminate water waste city-wide
6. Create equitable demand reduction targets; and
7. Minimize adverse financial effects

The following priorities are listed for use of available water from highest to lowest priority:

1. Health and Safety including: consumption and sanitation for all water users; fire suppression; hospitals, emergency care, nursing and other convalescent homes and other similar health care facilities; shelters and water treatment
2. Institutions, including government facilities and schools such as public safety facilities, essential government operations, public pools and recreation areas
3. All non-essential commercial and residential water uses
4. Landscaped areas of significance, including parks, cemeteries, open spaces, government-facility landscaped areas and green belt areas
5. New water demand

The City will also work in conjunction with MWD to implement water shortage plans on a regional level.

7.2 RESPONSE PLAN

In 1992, the Beverly Hills City Council adopted an Emergency Water Conservation

Ordinance (Ordinance 92-O-2139), which establishes five stages of water shortage severity based on predicted or actual water supply reductions. The City implements certain initiatives to optimize water supply during water shortages or drought conditions. The City will manage water supplies to minimize the social and economic impacts of water shortages. The Water Conservation Ordinance is designed to provide a minimum of 50 percent of normal supply during a severe or extended water shortage. The City's two potable water sources are local groundwater and imported deliveries through MWD. Rationing stages may be triggered by a shortage in one source or a combination of sources, and shortages may trigger a stage at any time. In the event of a shortage, the City Manager will declare the appropriate water conservation stage by resolution as shown below in **Table 7.1**:

Table 7.1
City of Beverly Hills Stages of Conservation
(To Be Implemented During Water Shortages)

Stage	Target (% Reduction)	Restrictions
A	5%	Voluntary implementation. Includes 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
B	10%	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, and plumbing and irrigation leaks shall be repaired as soon as possible.
C	20%	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.
D	30%	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.
E	50%	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.

Figure 7.2: Severe Droughts Highlight the Importance of Conservation Ordinances

To supplement the City's conservation efforts, the City also developed an Efficient Landscaping Ordinance (City Ordinance No. 09-O-2574) that was adopted in 2009 pursuant to the Water Conservation Act. The City's Landscape Efficiency Ordinance, which became effective last year (2010) provides for the efficient use of water in landscapes. The City modified the Landscape ordinance model prepared by DWR 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 each criteria is met, then the Director of Community Development or designee shall issue a Water Efficient Landscape permit to the application.

In addition to the City's Conservation Plan, the City will work in conjunction with the actions of MWD during water shortages. MWD responds to periods of drought and surplus under the guidelines set forth in its Water Surplus and Drought Management Plan (WSDM) as described in the following section.

MWD Water Surplus and Drought Management (WSDM) Plan

In addition to the provisions of the Conservation Ordinance, the City will also work in conjunction with MWD to implement conservation measures within the framework of MWD's Water Surplus and

Drought Management (WSDM) Plan. The WSDM Plan was developed in 1999 by MWD with assistance and input with its member agencies. The plan addresses both surplus and shortage contingencies.

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

7.3 THREE-YEAR MINIMUM SUPPLY

Due to the natural replenishment of the Hollywood Subbasin coming from surface and subsurface flows (in addition to percolation from precipitation) the Hollywood Subbasin has moderate dry season groundwater supply protection. Furthermore, since the City will continue to have access to imported water, the City may import water to meet demand, if necessary. Imported water supplies, like groundwater, are subject to demand increases and reduced supplies during dry years. However, MWD modeling in its 2010 Regional UWMP, as referenced in **Tables 5.2** through **5.10** in **Section 5**, results in 100 percent reliability for full-service demands through the year 2035 for all climatic conditions. Based on the conditions described above, the City anticipates the ability to meet water demand for all climatic conditions for the near future. **Table 7.2** displays the minimum water supply available to the City based on a three-year dry period for the next three years

Table 7.2
Projected 3-yr Minimum Water Supply (AF)

Source	Yr. 1	Yr. 2	Yr. 3
Imported	12,628	12,442	12,255
Ground	800	800	800
Total	**13,428**	**13,242**	**13,055**

Based on the above analysis, the City should expect 100% supply reliability during a three year drought period over the next three years.

7.4 CATASTROPHIC INTERRUPTIONS

A water shortage emergency could be a catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions. During a disaster, the City will work cooperatively with MWD through their Member Agency Response System (MARS) to facilitate the flow of information and requests for mutual-aid within MWD's 5,100-square mile service area. In the event of groundwater supply loss, all supply could be imported from MWD, once confirmed that the necessary capacity is available to do so.

Additional emergency services in the State of California include the Master Mutual Aid Agreement, California Water Agencies Response Network (WARN) and Plan Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement and is planned

out of the California Office of Emergency Services. WARN includes all public agencies that have signed the agreement to WARN and provides mutual aid assistance. It is managed by a State Steering Committee. Plan Bulldozer provides mutual aid for construction equipment to any public agency for the initial time of disaster when danger to life and property exists.

Emergency Storage Requirements

MWD'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. MWD'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. MWD's planning, therefore, is based on 100 percent reduction in its supplies for a period of six months. MWD's emergency planning is based on a greater shortage than required To safeguard the region from catastrophic loss of water supply, MWD 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 MWD's interruptible program would be made available, and MWD would draw on its emergency storage, as well as other available storage. MWD 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, MWD has access to emergency storage at its other reservoirs, at the SWP terminal reservoirs, and in its groundwater conjunctive use storage accounts.

Figure 7.3: Lake Hemet Storage Reservoir

With few exceptions, MWD 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 MWD'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, MWD 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. MWD'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, MWD's analysis showed that it would be able to supply all 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. MWD's analysis further suggested that the scenarios investigated were not the worst-case situation. Under more extreme hydrology, MWD might have to reduce firm deliveries to MWD's member agencies by as much as 10 percent.

Electrical Outages

MWD 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 MWD treatment plants have backup generation sufficient to continue operating in event of supply failure on the main electrical grid
- Valves at Lake Skinner (Riverside) can be operated by the backup generation at the Lake Skinner treatment plant
- MWD owns mobile generators that can be transported quickly to key locations if necessary

7.5 PROHIBITIONS & PENALTIES

In the event that the Phased Water Conservation Plan is violated, the City reserves the right to impose penalties. Penalties will be imposed through a three tier system, as included under the City Municipal Code, Section 12-4, and shall include the following:

1. First Violation. $100 dollar fine
2. Second Violation. $200 dollar fine
3. Third and Subsequent Violation. $500 dollar fine

7.6 FISCAL IMPACTS

A reduction in water consumption could result in loss of revenues needed to maintain and operate the water system. The following actions shall be implemented under such circumstances:

- Implement a conservation surcharge during drought periods to help offset a portion of revenue lost due to reduction of water sales
- Delay capital improvement projects
- Consider temporary increase of water rates to meet operation and maintenance costs

7.7 COUNCIL ORDINANCE

The City's contingency plan (Ordinance 92-O-2139) is included in Appendix E.

7.8 MECHANISMS TO DETERMINE ACTUAL REDUCTIONS IN USE

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.

Appendix A: References

City of Beverly Hills 2010 Urban Water Management Plan

References

1. City of Beverly Hills. "2005 Urban Water Management Plan"
2. Metropolitan Water District of Southern California. "2010 MWD Regional Urban Water Management Plan (RUWMP)" December, 2010
3. Metropolitan Water District of Southern California. "2010 MWD Integrated Resources Plan (IRP) Update" July, 2010
4. http://www.worldclimate.com/ "Weather, rainfall, and temperature data" April, 2011
5. Metropolitan Water District of Southern California. "Chapter IV - Groundwater Basin Reports Los Angeles Coastal Plain Basins - Hollywood Subbasin" September, 2007
6. California Department of Water Resources. " Hollywood Subbasin" (Bulletin 118) February, 2004
7. California Department of Water Resources. "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan" February, 2011
8. City of Beverly Hills. "Water Conservation Ordinance" Ordinance No. 92-O-2139
9. City of Beverly Hills. "Efficient Landscape Ordinance" Ordinance No. 09-0-2574
10. City of Beverly Hills. Groundwater production, purchases and water sales statistics.

Appendix B: Urban Water Management Planning Act

City of Beverly Hills 2010 Urban Water Management Plan

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384, Costa, 2002
SB 1518, Torlakson, 2002
AB 105, Wiggins, 2004
SB 318, Alpert, 2004
SB 1087, Florez, 2005
SBX7 7, Steinberg, 2009

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the

past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the ‘‘Memorandum of Understanding Regarding Urban Water Conservation in California,’’ dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

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

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

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

(h) A draft water shortage contingency resolution or ordinance.

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

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled

pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Articl 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water

supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Appendix C: DWR UWMP Checklist

City of Beverly Hills 2010 Urban Water Management Plan

Table I-1 Urban Water Management Plan checklist, organized by legislation number

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	System Demands		**Section 4.5** **Appendix C**
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	System Demands	Retailer and wholesalers have slightly different requirements	**Section 1.2** **Appendix D**
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not applicable	Standardized form not yet available	**Not Applicable**
4	Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)	Plan Preparation		**Section 1.2** **Appendix D**
5	An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.	10620(f)	Water Supply Reliability . . .		**Section 2** **Section 4.5** References to efficiency & sustainability throughout plan
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.	10621(b)	Plan Preparation		**Section 1.2** **Appendix D**
7	The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).	10621(c)	Plan Preparation		**Section 1.1** **Section 1.2** **Appendix D**
8	Describe the service area of the supplier	10631(a)	System Description		**Section 1.5**
9	(Describe the service area) climate	10631(a)	System Description		**Section 1.6**

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
10	(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . .	10631(a)	System Description	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	**Section 1.7** Projections based on MWD 2010 IRP Update for City's Water service area
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	**Section 1.7** Projections based on MWD 2010 IRP Update for City's Water service area
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		**Section 1.7** City has significant daytime populations
13	Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).	10631(b)	System Supplies	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	**Section 2** Imported Water Groundwater

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .?	10631(b)	System Supplies	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	**Section 2.2** Yes groundwater is a source of supply
15	(Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies		**Groundwater management plan will not be provided at the current time (plan is still in draft form).**
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies		**Section 2.2 "Groundwater"**
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	System Supplies		**Not Currently Applicable** Basin is in process of adjudication
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	System Supplies		**Not Currently Applicable** Basin is in process of adjudication
19	For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.	10631(b)(2)	System Supplies		**Section 2.2** City operates well under long term safe yield estimates of 3,000 AFY
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(3)	System Supplies		**Section 2.2 "Groundwater"** ***Groundwater Production***

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
21	(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(4)	System Supplies	Provide projections for 2015, 2020, 2025, and 2030.	**Section 2.4** **Section 5.4 (Tables 5.4-5.10)**
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Water Supply Reliability . . .		**Section 5 (Tables 5.4-5.10)**
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)	Water Supply Reliability . . .		**Section 5; Section 7** During times of groundwater supply interruption, City will import water and implement its Conservation Ordinance.
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies		**Section 2.6**
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;(I) Agricultural.	10631(e)(1)	System Demands	Consider “past” to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	**Section 4.3** **Section 4.4**

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
26	(Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition;(N) Residential ultra-low-flush toilet replacement programs.	10631(f)(1)	DMMs	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	**Section 6** City is a member of CUWCC and submits annual reports
27	A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.	10631(f)(3)	DMMs		**Section 6** City is a member of CUWCC and submits annual reports
28	An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.	10631(f)(4)	DMMs		**Section 6** City is a member of CUWCC and submits annual reports
29	An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.	10631(g)	DMMs	See 10631(g) for additional wording.	**Not Applicable (See Section 6)** City is a member of CUWCC and submits annual reports

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
30	(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.	10631(h)	System Supplies		**Section 4.6** **Section 5.6**
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	System Supplies		**Section 2.5** No plans for desalination.
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	**Section 6** City is a member of CUWCC and submits annual reports **Appendix H**
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	10631(k)	System Demands	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	**Section 2** **Section 5.4** Tables 5.2-5.10 deal with imported water supply available from MWD. Groundwater supply is also shown up 2035.

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	System Demands		**Section 4.5**
35	Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.	10632(a)	Water Supply Reliability . . .		**Section 7.2** ***Stages of Action***
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	Water Supply Reliability . . .		**Section 7.3** Based on Tables 5.6-5.10
37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)	Water Supply Reliability . . .		**Section 7.4**
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)	Water Supply Reliability . . .		**Section 7.5**
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)	Water Supply Reliability . . .		**Section 7.5**
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Water Supply Reliability . . .		**Section 7.5**
41	An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)	Water Supply Reliability . . .		**Section 7.6**
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Water Supply Reliability . . .		**Section 7.7** **Appendix E**
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Water Supply Reliability . . .		**Section 7.8**

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
44	Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area	10633	System Supplies		**Section 2.5**
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)	System Supplies		**Section 2.5**
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	System Supplies		**Section 2.5**
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	System Supplies		**Section 2.5**
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	System Supplies		**Section 2.5**
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	System Supplies		**Section 2.5**
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	System Supplies		**Section 2.5**
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)	System Supplies		**Section 2.5**

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
52	The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.	10634	Water Supply Reliability . . .	For years 2010, 2015, 2020, 2025, and 2030	**Section 3**
53	Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)	Water Supply Reliability . . .		**Section 5**
54	The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.	10635(b)	Plan Preparation		**To be performed after plan is adopted**
55	Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642	Plan Preparation		**Ongoing** 60-day notice prior to Public Hearing. Public Notice in local press. Proof of Notice & Public Hearing to be included in **Appendix D**
56	Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.	10642	Plan Preparation		**Ongoing** 60-day notice prior to Public Hearing. Public Notice in local press. Proof of Notice & Public Hearing to be included in **Appendix D**
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation		**Proof of Adoption/Resolution to be provided in Appendix D**

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	Plan Preparation		**Section 1.1**
59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.	10644(a)	Plan Preparation		**To be performed after plan is adopted**
60	Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.	10645	Plan Preparation		**To be performed after plan is adopted**

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

Appendix D: Coordination, Public Notice, & City Council Adoption of 2010 UWMP

City of Beverly Hills 2010 Urban Water Management Plan

To Be Provided Later

Appendix E: Emergency Water Conservation Ordinance

City of Beverly Hills 2010 Urban Water Management Plan

ORDINANCE NO. 92-0-2139

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS ESTABLISHING AN EMERGENCY WATER CONSERVATION PLAN AND AMENDING THE BEVERLY HILLS MUNICIPAL CODE

THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS DOES HEREBY ORDAIN AS FOLLOWS:

Section 1. The City of Beverly Hills and the State of California are experiencing prolonged drought conditions. Due to such drought conditions, the general health, safety, and welfare requires that the City maximize the beneficial use of all water utility customers to the extent to which they are capable, and that the City prevent the waste or unreasonable use of potable water.

Section 2. Administrative procedures must be provided in order to encourage proper potable water use regardless of supply, to regulate potable water use during drought periods, and to restrict water use during water emergencies. This ordinance shall establish these procedures, which are necessary for the health, safety and welfare of the residents of the City of Beverly Hills.

Section 3. Article 3 of Chapter 4 of Title 9 of the Beverly Hills Municipal Code is hereby added to read as follows:

"Article 3. Emergency Water Conservation Plan

SEC. 9-4.301 Authority of City Manager.

1. The City Manager is hereby authorized and directed to implement the applicable provisions of this Article in order to protect the public health, safety, and welfare under the following conditions:

a. In the event of an unforeseeable disaster or water emergency such as an earthquake, reservoir failure or other major disruption in the water supply, the City Manager is authorized to implement the emergency provisions of this Article.

b. In the event of a foreseeable water emergency, such as an extended drought, the City Manager is authorized to implement the applicable provisions of this Article, after holding a public hearing before the City Council.

2. The City Manager is authorized to determine and declare that a water shortage emergency exists in any or all parts of the City of Beverly Hills and upon such determination, to promulgate such regulations, rules and conditions relative to the time of using water, the purpose or purposes for which it may be used and such other necessary limitations as will, in his or her opinion, relieve the water shortage in such part or parts of the City.

3. The City Council may review and affirm, reverse, or modify any determination made or regulations, rules or conditions promulgated by the City Manager pursuant to this Article.

4. All references to the City Manager in this Article shall mean the City Manager or his or her designate.

Sec. 9-4.302. General prohibition; Applicability.

No person shall use or permit the use of water from the City for residential, commercial, industrial, governmental, or any other purposes in violation of any provision of this Article or in an amount in excess of the use that is permitted by the water conservation stages defined below. The provisions of this Article shall apply to all persons, customers and property served by the City of Beverly Hills, Public Works Department - Utilities Division wherever situated.

Sec. 9-4.303. Declaration of water conservation stages.

1. Water conservation stages shall be determined by the amount of water available or the potential for water interruption. The City Manager shall monitor the supply and demand for water by customers. When the City Manager finds that the guidelines for initiation of any stage, as set forth in this Article, have been satisfied, he or she shall recommend to the City Council that a Resolution to declare the appropriate water conservation stage be adopted.

2. The Resolution by the City Council implementing or terminating conservation stages shall be published at least once in a newspaper of general circulation within the City and posted in at least three public places and shall continue to be posted

until such time as the restrictions of each stage are repealed by Resolution of the City Council.

3. Except as otherwise may be provided by this Article or a resolution adopted by the City Council, any prohibitions on the use of water shall become effective immediately upon publication in a newspaper of general circulation within the City. Except as otherwise may be provided by a resolution adopted by the City Council, any provisions requiring a percentage reduction in the use of water shall become effective at the first full billing period commencing on or after the date of such publication.

SEC 9-4.304. Requirements for water conservation stages.

A. Stage "A" Requirements.

1. A Stage "A" shortage shall be declared when the City Manager determines that a five percent (5%) reduction in potable water use is required.

2. Stage "A" compliance shall consist of voluntary implementation of water conservation elements including, without limitation, reduced irrigation, no washdown of paved areas except to alleviate immediate fire or sanitation hazards, reduced operation of non-recycling fountains, notification of hotel and restaurant patrons of water conservation goals, serving of water at restaurants only upon request and use of reclaimed water for construction purposes.

B. Stage "B" Requirements.

1. A Stage "B" shortage shall be declared when the City Manager determines that a ten percent (10%) reduction in potable water use is required.

2. Stage "B" compliance elements shall include the following mandatory elements:

a. Restaurants shall serve water upon request only;

b. All public restrooms in the City and private bathrooms in hotels shall notify patrons and employees of water conservation goals;

c. Plumbing and irrigation leaks shall be repaired as soon as practicable. The City may issue notices to repair visible leaks;

d. Water usage shall be reduced to ninety percent (90%) of the baseline year amount as determined by the City Manager.

3. A water penalty surcharge of up to two (2) times the basic water rate shall be charged for water usage in excess of ninety percent (90%) of the baseline year amount as determined by the City Manager.

4. Violation by any person of the Stage "B" mandatory requirements shall constitute an infraction and, upon conviction, shall be punished by a fine not to exceed one hundred dollars ($100). The violation of each element, and each separate violation thereof, shall be deemed a separate offense, and shall

be punished accordingly.

C. Stage "C" Requirements.

1. A Stage "C" shortage shall be declared when the City Manager determines that a twenty percent (20%) reduction in potable water use is required.

2. Stage "C" compliance elements shall include the following mandatory elements:

a. Restaurants shall serve water upon request only;

b. All public restrooms in the City and private bathrooms in hotels shall notify patrons and employees of water conservation goals;

c. Plumbing and irrigation leaks shall be repaired as soon as practicable. The City may issue notices to repair visible leaks;

d. Water usage shall be reduced to eighty percent (80%) of the baseline year amount as determined by the City Manager.

3. A water penalty surcharge of up to three (3) times the basic water rate shall be charged for water usage in excess of eighty percent (80%) and not more than one hundred percent (100%) of the baseline year amount as determined by the City Manager. A water penalty surcharge of up to ten (10) times the basic water rate shall be charged for water usage in excess of one hundred percent (100%) of the baseline year amount as

determined by the City Manager.

4. Violation by any person of the Stage "C" mandatory requirements shall constitute a misdemeanor and, upon conviction, shall be punished by a fine not to exceed five hundred dollars ($500). Water supply through irrigation water services may be terminated for continued excessive use. The violation of each element, and each separate violation thereof, shall be deemed a separate offense, and shall be punished accordingly.

D. Stage "D" Requirements.

1. A Stage "D" shortage shall be declared when the City Manager determines that a thirty percent (30%) or higher reduction in potable water use is required.

2. Stage "D" compliance elements shall include the following mandatory elements:

a. Restaurants shall serve water upon request only;

b. All public restrooms in the City and private bathrooms in hotels shall notify patrons and employees of water conservation goals;

c. Plumbing and irrigation leaks shall be repaired as soon as practicable. The City may issue notices to repair visible leaks;

d. Landscape irrigation shall be restricted to selected days and times as determined by the City Manager, unless such irrigation uses reclaimed wastewater;

e. Refilling of swimming pools, spas or ponds shall be prohibited unless required for health reasons;

f. Operation of water fountains shall be prohibited;

g. Exterior washdown of buildings and washdown of vehicles shall be prohibited, unless:

i) The washing is done on the immediate premises of a commercial car wash or commercial service station or with reclaimed wastewater; or

ii) The health, safety and welfare of the public is contingent upon frequent vehicle cleaning, such as the cleaning of garbage trucks and vehicles to transport food and perishables;

h. Water usage from fire hydrants shall be limited to fire fighting, related activities or other activities necessary to maintain the public health, safety and welfare.

i. Water usage shall be reduced to seventy percent (70%) of the baseline year amount as determined by the City Manager.

3. A water penalty surcharge of up to four (4) times the basic water rate shall be charged for water usage in excess of seventy percent (70%) but not more than one hundred percent (100%) of the baseline year amount as determined by the City Manager. A water penalty surcharge of up to ten (10) times the basic water rate shall be charged for water usage in excess of one hundred percent (100%) of the baseline year amount as

determined by the City Manager.

4. Violation by any person of the Stage "D" mandatory requirements shall constitute a misdemeanor and, upon conviction, shall be punished by a fine not to exceed one thousand dollars ($1000). Continued excessive use may result in termination of water supply through irrigation water services and/or restriction of water supply through domestic meters. The violation of each element, and each separate violation thereof, shall be deemed a separate offense, and shall be punished accordingly.

E. Stage "E" Requirements.

1. A Stage "E" shortage shall be declared when the City Manager determines that a catastrophic interruption of potable water supply has occurred or is foreseen.

2. The City Manager shall have emergency water allocation authority in the case of a Stage "E" declaration. This authority shall include the authority to interrupt service to any property or City service zone in order to provide the maximum water supply for human health and safety needs.

3. In allocating water, the City Manager shall give 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, then to enhance the aesthetics of the environment, and then to facilitate construction activities.

4. Violation by any person of the Stage "E" emergency water conservation regulations shall constitute a misdemeanor and, upon conviction, shall be punished by a fine not to exceed one thousand dollars ($1000) and six months in jail. Continued excessive use may result in termination of water supply through irrigation water services and/or restriction of water supply through domestic meters. The violation of each element, and each separate violation thereof, shall be deemed a separate offense, and shall be punished accordingly.

SEC. 9-4.305 Notice of Violation.

1. The City shall give notice of violation to the person committing a violation of this Article as follows:

a. Notice of violation of any water usage percentage reduction provisions shall be given in writing by regular mail.

b. Notice of violation of any other mandatory requirement listed in Section 9-4.304 shall be given in writing in the following manner:

i) by giving the notice to the customer personally; or

ii) if the customer is absent from or unavailable at the premises at which the violation occurred, by leaving a copy with some person of suitable age and discretion at the premises and sending a copy through the regular mail to the address at which the customer is

normally billed; or

iii) if a person of suitable age or discretion cannot be found, then by affixing a copy in a conspicuous place at the premises at which the violation occurred and also sending a copy through the regular mail to the address at which the customer is normally billed.

2. The notice shall contain a brief description of the facts of the violation, a statement of the possible penalties for each violation and a statement informing the customer of his or her right to a hearing on the merits of the violation pursuant to Section 9-4.306.

SEC. 9-4.306. Hearings.

1. Any person receiving notice of a violation of Section 9-4.304 shall have a right to a hearing by the City Council if requested within fifteen (15) days of mailing or other delivery of the notice of violation.

2. The timely written request for a hearing shall not stay the imposition of a surcharge unless within the time period to request a hearing, the amount of any unpaid surcharge due is deposited with the City Treasurer. If it is determined that the surcharge was wrongly assessed, the City shall refund any money deposited.

3. The decision of the City Council shall be final.

4. The City Council may delegate its duties and responsibilities under this section to the City Manager as it considers appropriate.

SEC 9-4.307. Additional water conservation measures.

After holding a public hearing before the City Council, the City Manager may order implementation of water conservation measures including or in addition to those set forth in Section 9-4.304, in order to encourage proper potable water use or to meet water conservation goals, regardless of supply.

SEC 9-4.308. Exceptions.

1. Nothing in this Article shall be construed to require the City to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

2. The City Manager may grant a reduction or waiver of the water penalty surcharge for water usage in excess of the required percentage of the baseline year amount if he or she finds one of the following exists:

a. Unique characteristics concerning the user's or customer's property makes it physically infeasible to reduce water consumption from the base year amount; or

b. The user has special needs related to a physical disability making it infeasible to reduce water

consumption from the base year amount."

Section 4. If any part of this Ordinance or the application thereof to any person or circumstances is for any reason held invalid by a court of competent jurisdiction, the validity of the remainder of the Ordinance or the application of such provision to other persons or circumstances shall not be affected. The City hereby declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses, or phrases be declared invalid.

Section 5. The City Clerk shall cause this Ordinance to be published in a newspaper of general circulation printed and published in the county and circulated in the City within fifteen (15) days after its passage, in accordance with Section 36933 of the Government Code, shall certify to the adoption and publication of this Ordinance, and shall cause this Ordinance and its certification, together with proof of publication, to be entered in the Book of Ordinances of the Council of this City.

Section 6. This ordinance shall go into effect and be in full force and effect at 12:01 a.m. on the thirty-first (31st) day after its passage.

Adopted: March 3, 1992

VICKI REYNOLDS
Mayor of the City of
Beverly Hills, California

ATTEST:

JEAN M. USHIJIMA
City Clerk

Approved as to form:

GREGORY W. STEPANICICH
City Attorney

Approved as to content:

MARK SCOTT
City Manager

DAN WEBSTER
Director of Public Works

2/11/92

Appendix F: Landscape Efficiency Ordinance

City of Beverly Hills 2010 Urban Water Management Plan

ORDINANCE NO. 09-O-2574

AN ORDINANCE OF THE CITY OF BEVERLY HILLS REGARDING WATER EFFICIENT LANDSCAPING AND PARKWAY SURFACES AND AMENDING THE BEVERLY HILLS MUNICIPAL CODE

THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS HEREBY ORDAINS AS FOLLOWS:

Section 1. Article 4 (Water Efficient Landscaping") of Chapter 4 (Water Regulations) of Title 9 (Building and Property Health and Safety Regulations) is hereby amended in its entirety to read as follows:

"Article 4. Water Efficient Landscaping

9-4-401: PURPOSE: Water is a precious commodity of limited supply. In accordance with the Water Conservation in Landscaping Act ("Act"), the purpose and intent of this ordinance is to:

A. Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;

B. Establish a structure for planning, designing, installing, and maintaining and managing water efficient landscapes in new residential or commercial development projects and when landscape areas are altered by more than 50 percent in total area;

C. Promote water management practices and water waste prevention for existing landscapes; and

D. Use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount.

Accordingly, this ordinance is intended to be as effective in conserving water as is the Department of Water Resources State Model Landscaping Ordinance set forth in Government Code Section 65595 and shall be known as the "Water Efficient Landscaping Ordinance."

9-4-402: APPLICABILITY:

Except as set forth in section 9-4-404, this article shall apply to all Landscaped Areas of new residential or commercial development projects, including City projects and facilities, all new installations of Landscaped Area irrigation systems, and all Altered Landscaped Areas, whether proposed as part of projects subject to plan reviews by any design or other reviewing body, or as part of projects not subject to review.

9-4-403: DEFINITIONS:

Unless the context otherwise requires, the following definitions shall govern the construction of this article:

ALTERED LANDSCAPED AREA: A Landscaped Area, including landscape areas of public property or facilities, that has been altered by more than fifty percent (50%) in total area.

CERTIFICATE OF COMPLETION: The document required under Section 9-4-411.

CERTIFIED LANDSCAPE IRRIGATION AUDITOR: A person certified to perform landscape irrigation audits by a recognized professional trade organization or other educational organization.

DEPARTMENT: The Department of Community Development.

DIRECTOR: The Director of the Department of Community Development or his/her designee.

ESTIMATED TOTAL WATER USE ("ETWU"): The total water used for the landscape subject to this Article determined pursuant to the formula set forth in the Landscape Regulations. The ETWU is based upon such factors as the local evapotranspiration rate, the size of the Landscaped Area, the types of plants and the efficiency of the irrigation system.

IRRIGATION AUDIT: An in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An Irrigation Audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

LANDSCAPE DOCUMENTATION PACKAGE: The documents required under Section 9-4-405 required to be submitted to the Department of Community Development for review and approval.

LANDSCAPE REGULATIONS: Rules and regulations adopted by the Director of Community Development for the implementation and enforcement of provisions of this Article, and when duly promulgated, such rules and regulations shall be in full force and effect.

LANDSCAPED AREA: The entire lot, including, water features such as pools, spas, ponds, and fountains. "Landscaped Area" shall not include the building footprint, driveways, non-irrigated portions of parking lots, hardscapes such as decks and patios, and other nonporous areas.

MAXIMUM APPLIED WATER ALLOWANCE ("MAWA"): The upper limit of annual applied water for the established Landscaped Area or Altered Landscaped Area determined pursuant to the formula set forth in the Landscape Regulations. The MAWA is based upon the local reference evapotranspiration rate, the ET_O Adjustment Factor and the size of the Landscaped Area or Altered Landscaped Area.

PROJECT APPLICANT: The person or entity submitting a Landscape Documentation Package. A Project Applicant may include the property owner and/or an agent of the owner.

SMART IRRIGATION CONTROLLER: A weather-based device that automatically controls an outdoor irrigation system by using weather, site or soil moisture data as a basis for determining an appropriate watering schedule or utilizing prevailing weather conditions, current and historic evapotranspiration, soil moisture levels, and other relevant factors to adapt water applications to meet the actual needs of the plants.

WATER EFFICIENT LANDSCAPE WORKSHEET: The document described in Section 9-4-410.

9-4-404: EXCEPTIONS:

This article shall not apply to:

A. Projects which involve alterations or additions to, or retrofits of, existing residential, commercial or public structures or facilities, unless the Landscape Area is altered as defined in Section 9-4-403.

B. Projects with a Landscaped Area of less than two thousand five hundred (2,500) square feet.

C. Landscaping that is part of a property listed on any applicable local, state or national register of historic places.

D. Plant collections as part of gardens and arboretums open to the public.

9-4-405: REVIEW AND APPROVAL REQUIREMENTS.

A. Prior to issuance of a building permit for any project that involves Landscaped Areas or Altered Landscaped Areas subject to this Article, the Project Applicant must submit a Landscape Documentation Package for review and approval by the Community Development Department ("Department"). The Landscape Documentation Package shall include the following:

1. Project information as required by the Landscape Regulations;
2. Landscape design plan as described in Section 9-4-406;
3. Irrigation design plan as described in Section 9-4-407;
4. Water Efficient Landscape Worksheet as described in Section 9-4-410
5. A soils management report as described in Section 9-4-409;
6. Grading design plan as described in Section 9-4-408; and
7. Payment of the fee as prescribed by City Council upon submittal of the Landscape Documentation Package.

If the Landscaped Area or Altered Landscaped Area subject to this Article is a stand-alone project or does not otherwise require a building permit or formal planning or other commission

approval or review, the Landscape Documentation Package shall be submitted to the Department for review and approval prior to the commencement of landscape improvements.

B. The documents listed in paragraph A shall be prepared and signed by a landscape architect, landscape designer, or irrigation designer, as appropriate, except that the soils report shall be prepared by a qualified soil and plant laboratory.

9-4-406: LANDSCAPE DESIGN PLAN:

A. Landscaped Areas or Altered Landscaped Areas subject to this Article shall be carefully designed and planned to ensure the efficient use of water. The Project Applicant shall submit to the Department a landscape design plan that meets the criteria set forth in this section and the criteria set forth in the Landscape Regulations.

B. The landscape design plan shall comply with or include the following:

1. A description of the plant material. Any plant may be selected for the landscape provided that the Estimated Applied Water Use in the Landscaped Area or Altered Landscaped Area does not exceed the Maximum Applied Water Allowance.

2. Landscape design plans for projects in the City's Very High Fire Hazard Severity Zones areas shall address fire safety and prevention. The Project Applicant shall ensure that the defensible space required by the Municipal Code is maintained and shall avoid fire-prone plant materials and mulches.

3. Invasive species of plants shall be prohibited near parks, buffers, greenbelts and open spaces and are generally discouraged for landscape use.

4. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

5. Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 + slope percent).

6. Recirculating water systems shall be used as a source for water features.

7. The surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

8. Pool and spa covers are highly recommended.

9. A minimum two inch (2″) layer of Mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers or direct seeding applications where Mulch is contraindicated.

10. Stabilizing mulching products shall be used on slopes.

11. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

12. Soil amendments shall be incorporated according to recommendations of the soil report, if any, and what is appropriate for the plants selected.

9-4-407: IRRIGATION DESIGN PLAN.

A. An irrigation system and its related components for Landscaped Areas and Altered Landscaped Areas subject to this Article shall be carefully designed and planned to allow for proper installation, management, and maintenance. The Project Applicant shall submit to the Department an irrigation design plan that meets the criteria set forth in this section and the criteria set forth in the Landscape Regulations.

B. An irrigation design plan shall comply with or include the following:

1. Smart Irrigation Controllers or other self-adjusting irrigation controllers, shall be required for all irrigation systems. The controller must be able to accommodate all aspects of the landscape and irrigation design plans.

2. All irrigation systems shall be designed to avoid excessive pressure. Water pressure regulators are required. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the time of day the system will operate. These pressure and flow measurements shall be conducted at the design stage, if available, or prior to installation, if not available at the design phase.

3. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulators, or booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

4. Sensor (rain, freeze, wind, etc.), either integral or auxiliary, that suspend irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions.

5. High-flow check valves, or other technology to interrupt operations in high-flow conditions created by irrigation system damage or malfunction, shall be required.

6. The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

7. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

8. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

9-4-408: GRADING DESIGN PLAN.

A. Grading of a project site that contains a Landscaped Area or Altered Landscaped Area subject to this Article, shall be designed to minimize soil erosion, runoff and water waste. The Project Applicant shall submit to the Department a grading design plan that meets the criteria set forth in this section and the criteria set forth in the Landscape Regulations.

B. The landscape grading plan shall indicate finished configurations and elevations of the landscape area including: (i) height of graded slopes; (ii) drainage patterns; (iii) pad elevations; (iv) finish grade; and (v) stormwater retention improvements, if applicable.

C. To prevent excessive erosion and runoff, grading shall avoid disturbing natural drainage patterns and avoid soil compaction in Landscaped Areas or Altered Landscaped Areas subject to this Article. All irrigation and normal rainfall should remain within the property lines so as not to drain onto non-permeable hardscapes.

D. A comprehensive grading plan prepared by a civil engineer for a project which includes Landscaped Areas or Altered Landscaped Areas subject to this Article, can satisfy this requirement.

9-4-409: SOIL MANAGEMENT REPORT.

The Project Applicant shall submit to the Department a soil management plan that meets the criteria set forth in the Landscape Regulations.

9-4-410: WATER EFFICIENT LANDSCAPE WORKSHEET.

A. The Project Applicant shall complete and submit to the Department a Water Efficient Landscape Worksheet that meets the criteria set forth in this section and the criteria set forth in the Landscape Regulations.

B. The Water Efficient Landscape Worksheet shall contain two sections; (i) a hydrozone information table and (ii) a water budget calculation for the Landscaped Areas or Altered Landscaped Areas subject to this Article. The water budget calculation shall include the Maximum Applied Water Allowance and the Estimated Total Water Use.

9-4-411: CERTIFICATION OF COMPLETION.

A. Upon completion of the installation of the Landscaped Areas or Altered Landscaped Area subject to this Article, the Project Applicant shall submit a Certificate of Completion, in the form provided by the City, for review and approval by the Director. The

Certificate of Completion shall be executed by either the licensed landscaped architect, licensed landscape contractor or the certified irrigation designer that signed any of the documents submitted as part of the Landscape Documentation Package.

B. The Certificate of Completion shall certify and/or include the following:

1. The Landscaped Areas or Altered Landscaped Areas subject to this Article has been installed in conformance with the Landscaped Documentation Package, the Water Efficient Landscaping Ordinance and the Landscape Regulations;

2. The automatic controller has been set according to the irrigation schedule described in Section 9-4-412;

3. Documentation that the soil management report recommendations, if any, have been implemented;

4. The Irrigation Audit Report; and

5. The landscape and irrigation maintenance schedule.

C. The Director shall approve the Certificate of Completion if it is determined the project conforms to the provisions of this Section. If the Director determines that the Certificate of Completion is incomplete or does not conform to the provisions of this Section, the Director shall:

1. Notify the Project Applicant in writing that the Certificate of Completion has been denied and include a statement of reasons; or

2. Notify the Project Applicant in writing that the Certificate of Completion is incomplete with an indication of additional information necessary. The Project Applicant may re-submit the Certificate of Completion for review by the Director.

D. The Project Applicant shall provide a copy of the approved Certificate of Completion to the property owner within 7 days of its approval.

9-4-412: IRRIGATION SCHEDULE

The Project Applicant shall prepare an irrigation schedule in accordance with the Landscape Regulations that evaluates and manages the amount of water required to maintain plant health.

9-4-413: LANDSCAPE AND IRRIGATION MAINTENANCE

The Project Applicant shall prepare a landscape and irrigation maintenance plan in accordance with the Landscape Regulations to ensure the efficiency of water use.

9-4-414: IRRIGATION AUDIT

A. For Landscaped Areas or Altered Landscaped Areas subject to this Article, the Project Applicant shall prepare an Irrigation Audit Report as set forth in the Landscape Regulations.

B. For all existing Landscaped Areas installed prior to January 1, 2010, irrigation audits shall be prepared as set forth in the Landscape Regulations.

9-4-415: IRRIGATION EFFICIENCY

A. New irrigation systems installed, whether or not part of a Landscaped Area or Altered Landscaped Areas subject to this Article, shall be designed, maintained and management to meet or exceed the average irrigation efficiency set forth in the Landscape Regulations.

B New irrigation systems installed as stand-alone project shall comply with Section 9-4-407, 9-4-410, 9-4-411, 9-4-412, 9-4-413 and 9-4-414 of this Article.

9-4-416: ALTERNATIVE WATER-EFFICIENT USE

Alternative methods of using water efficiently such as the use of potable water, rain water or other alternative water systems are encouraged.

9-4-417: STORMWATER MANAGEMENT

A. Landscape and grading design plans shall be developed in accordance with the applicable provisions of the Stormwater and Urban Runoff Control provisions set forth in Article 5 of Chapter 4 of Title 9 of this Municipal Code.

B. Rain gardens, cisterns, and other landscape features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are encouraged.

9-4-418. WATER WASTE PREVENTION.

Water waste resulting from inefficient landscape irrigation, such as runoff, low head drainage, overspray or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots or structures is prohibited.

9-4-419. AUTHORITY TO PROMULGATE RULES AND REGULATIONS.

The Director of Community Development shall have the power and authority to promulgate rules and regulations for the implementation and enforcement of provisions of this Article, and when duly promulgated, such rules and regulations shall be in full force and effect.

9-4-420: ADMINISTRATION AND APPEAL PROCESS.

The Director shall have the duty and authority to administer and enforce this Article. The Project Applicant or property owner may appeal any other decision made by the Director pursuant to this Article by filing with the Director within 15 days of the date of written notification of the action at issue. The appeal shall be held pursuant to the applicable provisions of the Uniform Administrative Code set forth in Section 9-1-103 of this Code.

9-4-421. PENALTIES.

Violation of any provision of this Article shall be punishable as provided for in Chapter 3 of Title 1. In addition, the City Building Official may deny any project subject to this Article its certificate of occupancy or equivalent until the Certificate of Completion has been submitted, reviewed and approved by the City.

Section 2: Section 8-4-1 of Chapter 8 of Title 8 of the City of Beverly Hills Municipal Code is hereby amended to read as follows:

"The abutting property owner shall plant and maintain the parkway with grass or other plant material that is maintained at no more than six inches in height as approved by the City's Arborist with the following exception: the parkway area abutting commercially zoned property may be surfaced in concrete in lieu of grass."

Section 3. The City Council has considered this Ordinance and finds that this project is exempt from the requirements of the California Environmental Quality Act ("CEQA"). The project is exempt pursuant to State CEQA Guidelines, 14 Cal. Code Regs. Sec. 15307 as an action taken to assure the maintenance, restoration, or enhancement of a natural resource, specifically water, where the regulatory process involves procedures for protection of the environment. This Ordinance does not contemplate any construction activities, and there is no evidence to suggest that the ordinance will result in a significant impact on the environment, including impacts due to unusual circumstances. The adoption of this Ordinance will result in the enhancement and protection of water resources in the City, and there is no evidence to suggest that the ordinance would in cumulative adverse environment impacts. Based on the foregoing and other substantial evidence in the record, the City Council hereby finds and determines that the Ordinance is exempt from the provisions of CEQA, pursuant to State CEQA Guidelines Section 15307. Further, as a separate and independent ground, the City Council finds that the Ordinance is covered by the general rule that CEQA applies only to projects that

have the potential for causing a significant effect on the environment. Because it can be seen with certainty that there is no possibility that the Ordinance will have a significant effect on the environment, the Ordinance is not subject to CEQA pursuant to State CEQA Guidelines Section 15061 (b)(3).

Section 4. If any section, subsection, subdivision, sentence, clause, phrase, or portion of this ordinance or the application thereof to any person or place, is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remainder of this ordinance. The City Council hereby declares that it would have adopted this ordinance, and each and every section, subsection, subdivision, sentence, clause, phrase, or portion thereof, irrespective of the fact that any one or more sections, subsections, subdivisions, sentences, clauses, phrases, or portions thereof be declared invalid or unconstitutional.

Section 5. The City Clerk is directed to forward a certified copy of his ordinance to the Department of Water Resources.

Section 6. This Ordinance shall go into effect and be in full force and effect on 12:01 a.m. on January 1, 2010.

PASSED, APPROVED and ADOPTED this 17th day of November ,2009.

Nancy Krasne

NANCY KRASNE
Mayor of the City of Beverly Hills, California

ATTEST:

_____ (SEAL)
BYRON POPE
City Clerk

APPROVED AS TO FORM:

_____
LAURENCE S. WIENER
City Attorney

APPROVED AS TO CONTENT:

_____
RODERICK J. WOOD, ICMA-CM
City Manager

_____
DAVID GUSTAVSON
Director of Public Works & Transportation

_____
SUSAN HEALY KEENE, AICP
Director of Community Development

Appendix G: MWD RUWMP Sections II & IV

City of Beverly Hills 2010 Urban Water Management Plan

Planning for the Future

2

The purpose of this section is to show how Metropolitan plans to meet Southern California's water supply needs in the future. In its role as supplemental supplier to the Southern California water community, Metropolitan faces ongoing challenges in meeting the region's needs for water supply reliability and quality. Increased environmental regulations and competition for water from outside the region have resulted in changes in delivery patterns and timing of imported water supply availability. At the same time, the Colorado River watershed has experienced a protracted drought since 1999 while total water demand continues to rise within the region because of population and economic growth.

As described in the previous chapter, the water used in Southern California comes from a number of sources. About one-third comes from local sources, and the remainder is imported from three sources: the Colorado River, the Sacramento-San Joaquin River Delta (via the State Water Project), and the Owens Valley and Mono Basin (through the Los Angeles Aqueducts).[1]

Because of competing needs and uses associated with these resources, and because of concerns related to regional water operations, Metropolitan has undertaken a number of planning initiatives over the past fifteen years. This Regional Urban Water Management Plan summarizes these efforts, which include the Integrated Resources Plan (IRP), two IRP Updates, the Water Surplus and Drought Management Plan, the Water Supply Allocation Plan, and the Long-term Conservation Plan. Collectively, they provide a policy framework with guidelines and resource targets for Metropolitan to follow into the future.

While Metropolitan coordinates regional water supply planning for the region through its inclusive integrated planning processes, Metropolitan's member agencies also conduct their own planning analyses – including their own urban water management plans – and may develop projects independently of Metropolitan. Appendix A.5 shows a list of these potential local projects provided to Metropolitan by its member agencies.

[1] Although the water from the Los Angeles Aqueduct is imported, Metropolitan considers it a local source because it is managed by the Los Angeles Department of Water and Power and not by Metropolitan.

2.1 Integrated Resource Planning

The 1996 IRP Process

Acknowledging the importance of water to the economic and social well-being of Southern California, Metropolitan has gradually shifted roles from an exclusive supplier of imported water to a regional water planner working in collaboration with its member agencies. After the drought of 1987-1992, Metropolitan recognized the changed conditions and the need to develop a long-term water resources strategy to fulfill the agency's mission of providing a high-quality reliable water supply to its service area. This planning process that was undertaken is now known as the Integrated Resources Plan (IRP). The first IRP was adopted by Metropolitan's Board in 1996 and guided by six objectives established early in the process:

1. Ensuring Reliability
2. Ensuring Affordability
3. Ensuring Water Quality
4. Maintaining Diversity
5. Ensuring Flexibility
6. Acknowledging Environmental and Institutional Constraints.

One of the fundamental outcomes of the IRP was the recognition that regional water supply reliability could be achieved through the implementation of a diverse portfolio of resource investments and conservation measures. The resulting IRP strategy was a balance between demand management and supply augmentation. For example, in its dry year profile, the resource framework counted on almost equal proportion of water conservation and recycled water as withdrawal from storage and water transfers. The IRP also balanced between the use of local resources and imported supplies. In a dry year, about 55 percent of the region's water resources come from local resources and conservation. Additionally, through the IRP process Metropolitan found solutions that offer long-term reliability at the lowest possible cost to the region as a whole.

The 1996 IRP, as a blueprint to resource program implementation, also established the "Preferred Resource Mix that would provide the Metropolitan region with reliable and affordable water supplies through 2020.

The IRP provided details on the Preferred Resource Mix and guidelines to established broad resource targets for each of the major supplies available to the region including:

- Conservation
- Local Resources - Water Recycling, Groundwater Recovery and Desalination
- Colorado River Supplies and Transfers
- State Water Project Improvement
- In-Region Surface Reservoir Storage
- In-Region Groundwater Storage

The 2004 IRP Update

In 2004, the Metropolitan Board adopted an updated IRP. Various legislative issues concerning population growth and water supply called for further planning considerations of these changed conditions. This IRP Update had three objectives:

1. Review the goals and achievements of the 1996 IRP
2. Identify the changed conditions for water resource development
3. Update resource development targets through 2025

The 2004 IRP process fulfilled the new objectives and updated the long-term plan to account for new water planning legislation. The updated plan contained resource development targets through 2025, which reflected changed conditions; particularly increased conservation savings, planned increases in local supplies and uncertainties. The 2004 IRP also explicitly recognized the need to handle uncertainties inherent in any planning process. For the water industry, some of these uncertainties are the level of population and economic growth which directly drive water demands, water quality regulations, new chemicals

found to be unhealthful, endangered species affecting sources of supplies, and periodic and new changes in climate and hydrology. As a result, a key component of the Updated Plan was the addition of a 10 percent planning buffer. The planning buffer provided for the identification of additional supplies, both imported and locally developed, that can be implemented to address uncertainty in future supplies and demands.

2010 Integrated Water Resources Plan Update

Metropolitan and its member agencies face increasing uncertainties and challenges as they plan for future water supplies. The 1996 and 2004 IRP resource strategies emphasized the need for a diverse and adaptable water supply strategy to cope with changing circumstances and conditions. Recent history and events have highlighted several emerging trends that need to be addressed in the context of the region's water supply planning and reliability. These trends cover a wide range of considerations including climate change, energy use and greenhouse gas emissions, endangered species protection and conveyance needs in the Sacramento-San Joaquin River Delta system. These trends point strongly to the importance of updating the region's Integrated Resources Plan, and to the need to solidify adaptive strategies to address additional challenges into the long-term future.

The basic objectives of the current IRP process are to:

1. Review the achievements of the 1996 IRP and the 2004 Update
2. Identify changing conditions affecting water resource development
    - Attention will be given to emerging factors and considerations, such as the current drought, climate change, energy use, and changes in Delta pumping operations
3. Update resource development targets through 2030
    - Discussion will focus on adaptation to future uncertainties, and potential alternatives for further diversifying Metropolitan's water resource portfolio and increasing supply reliability in the face of changing circumstances

Public Process

The current IRP Update process has sought input from member agencies, retail water agencies, other water and wastewater managers, environmental, business and community interests. In the fall of 2008, Metropolitan's senior management, Board of directors, member agency managers, elected officials, and community groups collectively discussed strategic direction and regional water solutions at a series of four stakeholder forums; nearly 600 stakeholders participated in the forums.

Similar types of ideas and issues were raised by the participants at all the forums, emphasizing the importance of local resources development and resolving issues with the Delta. Participants suggested that Metropolitan should take a leadership position in several areas including:

- Providing outreach to legislators concerning needs for water supply reliability and quality improvements
- Developing brine lines to enhance recycled water use
- Fostering partnerships with energy utilities
- Building relationships with environmental community
- Participating in research and development of new technologies
- Providing assistance to retail agencies in designing "correct" tiered rate structures

Technical Workgroup Process

Following the stakeholder forums, Metropolitan embarked upon a Technical Workgroup Process to further explore some of the issues and opportunities identified by forum participants. To facilitate the workgroup process, the technical discussions were grouped into six resource areas:

- Conservation
- Graywater
- Groundwater
- Recycled water
- Stormwater / Urban Runoff
- Seawater Desalination

The Technical Workgroup process provided a forum for review of the issues associated with each area, and in-depth discussions with area experts. The workgroups included member agency and retail agency staff, other non-governmental organizations, and staff from wastewater and stormwater management agencies, as well as Metropolitan staff and consultants.

Strategic Policy Review

As part of the current IRP update process, Metropolitan's Board initiated a Strategic Policy Review. This Review examined the ramifications of alternative roles for Metropolitan, member agencies and local retail agencies in future development of water resources. The process explored three alternative policy cases:

1. Current approach – continuation of IRP policies and partnerships with member agencies
2. Imported focus – Metropolitan focuses on addressing Delta issues, imported supplies and water transfers and leaves local supply development entirely to member agencies
3. Enhanced Regional focus – Metropolitan examines new approaches, up to and including development and ownership for implementing large regional scale water recycling, groundwater recharge and seawater desalination

A study of water supply reliability and cost impacts associated with these approaches found that it is in the region's best interest for Metropolitan to continue to explore ways of increasing regional reliability and not limiting itself to singular areas like addressing Delta issues. The study results under this process was a broader view of Metropolitan's role in comprehensive planning and implementation for regional reliability; adopting an adaptive resource development plan for the future may provide the most benefit for the region. In this adaptive approach, Metropolitan may need to take on an enhanced role in local supply development, in order to best adapt and respond to changing regional conditions and lay a solid foundation for future reliability. This role could include the creation of partnership with local agencies or Metropolitan's direct ownership of local projects to ensure regional reliability. The adaptive approach would be incorporated into the 2010 IRP for Board consideration.

Uncertainty Analysis

A major component of the current IRP update effort is to explicitly reflect uncertainty in Metropolitan's future water management environment. This involves evaluating a wider range of water management strategies, and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, will be incorporated in to the update and accounted for. A key evolution from the 2004 IRP will be the identification of vulnerabilities and contingency actions that will extend the concept of a Planning Buffer into tangible actions that will enable construction and implementation of contingency supplies if they are needed.

Adaptive Planning Implementation

Regional water supply reliability largely depends on Metropolitan's preparedness to adapt to supply uncertainties. An adaptive management approach was utilized in developing a strategy that will prepare the region to deal with unforeseen supply shortages. An important step in this approach is identifying where additional water supply will come from. Four local water sources were considered:

- Stormwater
- Recycled Water
- Graywater
- Seawater

The stakeholder groups established during the IRP process evaluated the viability of using one or more of these resources to supplement existing water supply in the region. The stakeholders (e.g., member agencies, retail agencies, and industry experts) gathered important information on each resource such as regional development status, yield potential, and implementation challenges.

Another key aspect of this strategy is determining what actions are required to eliminate or mitigate the implementation challenges in developing these resources. The adaptive approach essentially provides a blueprint on how to address these challenges and develop supply within each resource.

The most important aspect of this strategy is the adaptive management approach used in responding to potential water supply shortage. The implementation elements identified within each blueprint can be executed at varying levels of urgency. Under the adaptive approach, Metropolitan developed three alternative implementation schedules for each resource:

- Status Quo
- Proactive
- Aggressive

Status Quo entails delaying action until a trigger is met. A trigger sets the point in time at which a potential shortage is identified and when deliberate action is taken to mitigate that shortage. The Proactive schedule implements low-risk actions early-on regardless of whether a trigger occurs. Implementing these low-risk actions shortens the overall time required to complete the implementation schedule. The Aggressive option implements both low-risk and medium-to-high risk actions that may require significant investment (e.g. land acquisition). By initiating these actions early-on, the overall implementation time can be shortened significantly. Table 2-1 highlights the differences between each schedule.

Table 2-1
Schedule Options

Schedule Option	Brief Description	Timeframe from Trigger to Production Yield	Financial Risk
Status Quo	Delay action until the adaptive management trigger occurs	Long	Low
Proactive	Begin planning actions (generally lower cost) before the adaptive management trigger occurs	Medium	Medium
Aggressive	Perform project implementation actions, such as land acquisition, before the adaptive management trigger occurs	Short	High

This strategy also utilizes an adaptive approach for determining an optimal project mix, or portfolio, used to meet a supply gap. The portfolio can comprise of projects from any of the four resources. Project drivers such as cost, yield, implementation time, and location of the project will be used to create customized portfolios that could address specific needs. For example, if a water supply shortage is occurring in a specific area, the portfolio could contain projects that serve that area. Another example might entail selecting projects that have the shortest implementation time in order to expedite supply development. Yet another example might involve selecting the most cost-efficient projects ($/AF) regardless of implementation time or location if minimizing costs is of highest priority. Furthermore, the number of projects within a portfolio is scalable based on the level of shortage at hand. This comprehensive approach is illustrated in Figure 2-1.

Metropolitan's adaptive approach is basically organized into four individual sections referred to as Foundational Studies. These individual studies discuss in detail the implementation challenges and recommended action for each resource. The first step in developing planning actions is categorizing the implementation challenges within each resource. In most cases the categories represent common themes such as establishing funding projects (Funding) or garnering legislative support (Legislative). The next step in developing planning actions is identifying implementation elements that mitigate the implementation challenges. This step involves identifying specific actions that are needed to support each implementation element. The last step in this process is developing of timelines and implementation schedules. Three alternative implementation schedules are developed for each resource.

Tables 2-2 through 2-5 summarize the categories and implementation elements for each resource. Detailed actions and schedules can be found in the foundational studies.

Figure 2-1 Comprehensive Approach

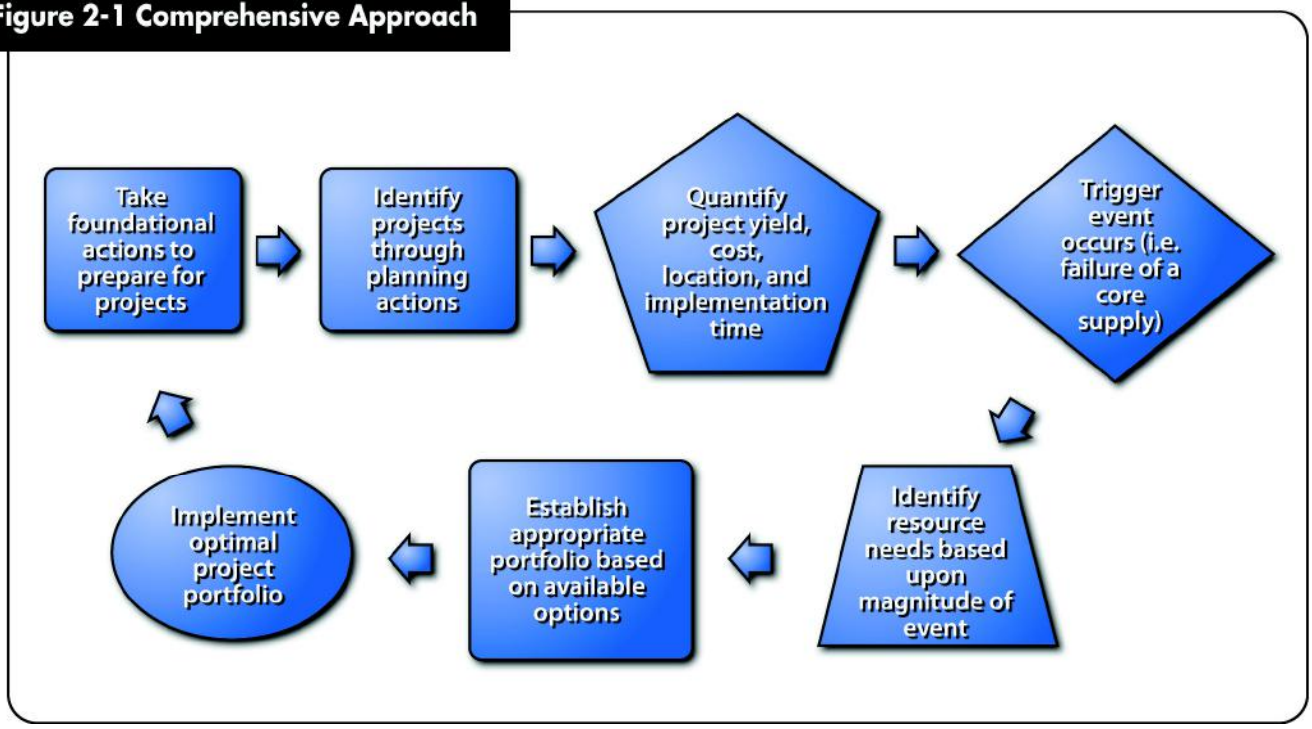

Table 2-2
Stormwater Issue Categories and Implementation Elements

Category	Implementation Element
Data Management	Regional Water Supply Project Database
Legislative/Regulatory/Education	Regional Synergy Task Force
Procedural	Regional Implementation Partnerships
Technical	Regional Feasibility Study
Funding	Funding Strategy Plan
Operational	Local Resource Baseline Plan
Implementation Planning	Alternatives Analysis Plan
Project Implementation	Incentive Programs Land Acquisition Advanced Planning Design Construction
Post Construction	O&M Performance Monitoring

Table 2-3
Recycled Water Issue Categories and Implementation Elements

Category	Implementation Element
Public Perception	Recycled Marketing Campaign Recycled Water Educational Campaign
Legislative	Recycled Water Legislative Task Force
Funding	Regional Recycled Water Finance Committee
Procedural	Regional Recycled Water Permitting and Inspection JPA Regional Recycled Water Policy Task Force
Operational	Regional Salt Management Plan Regional Basin Management Plan Recycled Water Blue Ribbon Panel (SWRCB) Regional Recycled Water Facility Plan
Facility	Regional Project (CIP) Implementation Joint Groundwater Replenishment Project

Table 2-4
Graywater Issue Categories and Implementation Elements

Category	Implementation Element
Public Perception	Graywater Marketing Campaign Graywater Educational Campaign
Legislative	Graywater Legislative Task Force
Technical	Regional Graywater Feasibility Study
Funding	Regional Graywater Finance Committee
Procedural	Regional Graywater Permitting and Inspection Regional Graywater Policy Task Force
Operational	Regional Graywater Management Plan
Construction	Regional Project Implementation

Table 2-5
Desalination Issue Categories and Implementation Elements

Category	Implementation Element
Data Management	Regional Water Supply Project Database
Legislative/Regulatory/Education	Regional Synergy Task Force
Procedural	Regional Implementation Partnerships
Technical	Regional Feasibility Study
Funding	Funding Strategy Plan
Operational	Local Resource Baseline Plan
Project Implementation	Incentive Programs Alternatives Analysis Plan Land Acquisition Advanced Planning Design Construction
Post Construction	O&M Performance Monitoring

Innovative approaches are critical to meeting the water supply needs of Southern California. Maintaining reliable water supplies given regulatory uncertainty, competing uses of groundwater and surface water, and overall variability in water supply is a growing challenge. An adaptive regional approach that develop, promote, and practice integrated regional water management of both traditional and emerging supplies may be the key to continued regional reliability.

2.2 Evaluating Supply Reliability

The Urban Water Management Plan Act requires that three basic planning analyses be conducted to evaluate supply reliability. The first is a water supply reliability assessment requiring development of a detailed evaluation of the supplies necessary to meet projected demands over at least a 20-year period. This analysis is to consider average, single-year and multi-year drought conditions. The second is a water shortage contingency plan which documents the actions that would be implemented in addressing up to a 50 percent reduction in an agency's supplies. Finally, a plan must be developed specifying the steps that would be taken under a catastrophic interruption in water supplies.

To address these three requirements, Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan. Supply and demand analyses for the single- and multi-year drought cases were based on conditions affecting the SWP. For this supply source, the single driest year was 1977 and the three-year dry period was 1990-1992. The SWP is the appropriate point of reference for these analyses since it is Metropolitan's largest and most variable supply. For the "average" year analysis 83 years of historic hydrology (1922-2004) were used to estimate supply and demand.

Estimating Demands on Metropolitan

Metropolitan developed its demand forecast by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation.[2] Projections of local supplies then were derived using data on current and expected local supply programs and the IRP Local Resource Program Target. The resulting difference between total demands net of conservation and local supplies is the expected regional demands on Metropolitan supplies. These various estimates are shown in Tables 2-6 through 2-8. Major categories used in these tables are defined below.

Total Demands

Total demand is the sum of retail demand for M&I and agricultural, seawater barrier demand, and replenishment demand. Total demand represents the total amount of water needed by the member agencies. Total demands include:

- Retail Municipal and Industrial (M&I) — Retail Municipal and Industrial (M&I) demands represent the full spectrum of urban water use within the region. These include residential, commercial, industrial, institutional and un-metered water uses. To forecast urban water demands Metropolitan used the MWD-MAIN Water Use Forecasting System (MWD-Main), consisting of econometric models that have been adapted for conditions in Southern California. The demographic and economic data used in developing these forecasts were taken from the Southern California Association of Government's (SCAG) 2007 Regional Transportation Plan and from the San Diego County Association of Government's (SANDAG) Series 12: 2050 Regional Growth Forecast (Feb 2010). The SCAG and SANDAG regional growth forecasts are the core assumptions that drive the estimating equations in Metropolitan's MWD-MAIN demand forecasting model. SCAG and SANDAG's projections undergo extensive local review and incorporate zoning information from city and county general plans and are backed by Environmental Impact Reports.

  Impacts of potential annexation are not included in the demand projections for the 2010 RUWMP. However, Metropolitan's Review of Annexation Procedures concluded that the impacts of annexation within the service area beyond 2020 would not exceed 2 percent of overall demands.

[2] Information generated as part of this analysis are contained in Appendix A-1.

- Retail Agricultural Demand — Retail agricultural demands consist of water use for irrigating crops. Member agencies estimate agricultural water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates their agricultural demand differently, depending on the availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2010 RUWMP
- Seawater Barrier Demand — Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits.
- Replenishment Demand — Replenishment demands represent the amount of water member agencies plan to use to replenish their groundwater basins. For the 2010 RUWMP, replenishment deliveries are not included as part of firm demands.

Conservation Adjustment

The conservation adjustment subtracts estimated conservation from total retail demand. The conservation estimates consist of three types:

- Code-Based Conservation — Water savings resulting from plumbing codes and other institutionalized water efficiency measures.
- Active Conservation — Water saved as a direct result of programs and practices directly funded by a water utility (e.g., measures outlined by the California Urban Water Conservation Council's "Best Management Practices"). Water savings from active conservation currently completed will decline to zero as the lifetime of those devices is reached. This will be offset by an increase in water savings for those devices that are mandated by law, plumbing codes or other efficiency standards.
- Price Effect Conservation — Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water.

Water Use Reduction Target

On November 10, 2009, the state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session, referred to as SBX7-7. This new law is the water conservation component of the historic Delta legislative package, and seeks to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. According to Water Code §10608.36, wholesale agencies are required to include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the water use reductions required under SBX7-7. Urban wholesale water suppliers are not required to comply with the target-setting and reporting requirements of SBX7-7. Additional discussion of the water reduction target is included in Section 3.7.

Based on Metropolitan' s analysis of population and demand and the methodologies for setting targets described in the legislation, compliance with 20x2020 on an individual agency basis throughout the region would result in reduced potable demand of 380 TAF in 2020 through additional conservation and/or recycling. This estimated amount is reflected in the projected demand tables under 20x2020 Retail Compliance.

Local Supplies

Local supplies represent a spectrum of water produced by the member agencies to meet their total demands. Local supplies are a key component in determining how much Metropolitan supply is needed to supplement member agencies local supplies to meet their total demand. Projections of local supplies relied on information gathered from a number of sources including past urban water management plans, Metropolitan's annual local production surveys, and

communications between Metropolitan and member agency staff. Local supplies include:

- Groundwater and Surface Water — Groundwater production consists of extractions from local groundwater basins. Surface water comes from stream diversions and rainwater captured in reservoirs.
- The Los Angeles Aqueduct — A major source of imported water is conveyed from the Owens Valley via the Los Angeles Aqueduct (LAA) by LADWP. Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled by a local agency.
- Seawater desalination — Seawater desalinated for potable use.
- Groundwater Recovery and Recycled Water — Locally developed and operated, groundwater recovery projects treat contaminated groundwater to meet potable use standards. Recycled water projects recycle wastewater for municipal and industrial use.
- Non-Metropolitan Imports — Water supplies imported by member agencies from sources outside of the Metropolitan service area.

The local supply projections presented in demand tables include existing projects that are currently producing water and projects that are under construction. Appendix A.5 contains a complete list of existing, under construction, fully designed with appropriated funds, feasibility, and conceptual projects that are within the service area.

Firm Demands

After calculating the expected regional demands on Metropolitan supplies, projected firm demands were calculated based on Metropolitan's established reliability goal. For the purposes of reliability planning, the 1996 IRP established a reliability goal that states that full service demands at the retail level would be satisfied under all "foreseeable hydrologic" conditions through 2020. This principle has been retained in the current update.

This goal allows for intermittent interruptions to non-firm, discounted rate supplies sold under the Replenishment and Interim Agricultural Water Programs. Thus, firm demand on Metropolitan equals Full Service demands (Tier I and Tier II). For the purpose of analysis, "foreseeable hydrologic conditions" is understood to mean under "historical hydrology," which presently covers the range of historical hydrology spanning the years 1922 through 2004. Tables 2-6 through 2-8 show estimates of firm demands on Metropolitan for single dry-year, multiple dry-year, and average year.

Table 2-6
Metropolitan Regional Water Demands
Single Dry Year
(Acre-Feet)

		2015	2020	2025	2030	2035
A.	**Total Demands[1]**	**5,480,000**	**5,662,000**	**5,804,000**	**5,961,000**	**6,101,000**
	Retail Municipal and Industrial	5,000,000	5,194,000	5,354,000	5,515,000	5,653,000
	Retail Agricultural	231,000	213,000	193,000	186,000	186,000
	Seawater Barrier	71,000	72,000	72,000	72,000	72,000
	Groundwater Replenishment	177,000	184,000	186,000	188,000	191,000
B.	**Total Conservation**	**936,000**	**967,000**	**1,033,000**	**1,096,000**	**1,156,000**
	Existing Active (through 2009)[2]	97,000	46,000	16,000	2,000	0
	Code-based and Price-Effect	589,000	671,000	766,000	844,000	906,000
	Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
C.	**SBx7-7 Water Conservation**	**190,000**	**380,000**	**380,000**	**380,000**	**380,000**
	20% by 2020 Retail-Level Compliance	190,000	380,000	380,000	380,000	380,000
D.	**Total Local Supplies**	**2,260,000**	**2,322,000**	**2,366,000**	**2,405,000**	**2,419,000**
	Groundwater	1,457,000	1,395,000	1,407,000	1,423,000	1,416,000
	Surface Water	98,000	97,000	97,000	97,000	97,000
	Los Angeles Aqueduct	66,000	66,000	66,000	66,000	66,000
	Groundwater Recovery	101,000	108,000	114,000	120,000	126,000
	Total Recycling	348,000	375,000	394,000	410,000	426,000
	Other Imported Supplies	190,000	281,000	288,000	288,000	288,000
E.	**Total Metropolitan Demands (E=A-B-C-D)**	**2,094,000**	**1,993,000**	**2,025,000**	**2,080,000**	**2,146,000**
	Full Service (Tier I and Tier II)	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
	Replenishment Service[3]	103,000	103,000	104,000	106,000	107,000
	Interim Agricultural Water Program[4]	0	0	0	0	0
3	**Firm Demands on Metropolitan[5]**	**1,991,000**	**1,889,000**	**1,921,000**	**1,974,000**	**2,039,000**

Notes:
All units are acre-feet unless specified, rounded the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2007 Regional Transportation Plan and SANDAG Series 12 2050 Regional Growth Forecast (Feb 2010).
[2] Includes code-based, price-effect and existing active savings through 2009; does not include future active conservation savings. 1990 is base year.
[3] Replenishment Service as defined in MWD Administrative Code Section 4114. Replenishment service includes direct and in-lieu replenishment.
[4] IAWP deliveries will be phased out by 2013.
[5] Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands.

Table 2-7
Metropolitan Regional Water Demands
Multiple Dry Year
(Acre-Feet)

		2015	2020	2025	2030	2035
A.	**Total Demands[1]**	**5,478,000**	**5,702,000**	**5,862,000**	**6,017,000**	**6,161,000**
	Retail Municipal and Industrial	5,004,000	5,232,000	5,409,000	5,572,000	5,715,000
	Retail Agricultural	231,000	214,000	195,000	185,000	184,000
	Seawater Barrier	71,000	71,000	72,000	72,000	72,000
	Groundwater Replenishment	172,000	184,000	187,000	188,000	190,000
B.	**Total Conservation**	**936,000**	**967,000**	**1,033,000**	**1,096,000**	**1,156,000**
	Existing Active (through 2009)[2]	97,000	46,000	16,000	2,000	0
	Code-based and Price-Effect	589,000	671,000	766,000	844,000	906,000
	Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
C.	**SBx7-7 Water Conservation**	**190,000**	**380,000**	**380,000**	**380,000**	**380,000**
	20% by 2020 Retail-Level Compliance	190,000	380,000	380,000	380,000	380,000
D.	**Total Local Supplies**	**2,171,000**	**2,305,000**	**2,343,000**	**2,378,000**	**2,402,000**
	Groundwater	1,386,000	1,389,000	1,389,000	1,397,000	1,396,000
	Surface Water	91,000	91,000	91,000	91,000	91,000
	Los Angeles Aqueduct	63,000	67,000	71,000	75,000	78,000
	Groundwater Recovery	100,000	107,000	113,000	119,000	125,000
	Total Recycling	340,000	370,000	390,000	407,000	423,000
	Other Imported Supplies	191,000	282,000	288,000	288,000	288,000
E.	**Total Metropolitan Demands (E=A-B-C-D)**	**2,154,000**	**2,049,000**	**2,106,000**	**2,163,000**	**2,224,000**
	Full Service (Tier I and Tier II)	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
	Replenishment Service[3]	97,000	102,000	103,000	104,000	104,000
	Interim Agricultural Water Program[4]	0	0	0	0	0
F.	**Firm Demands on Metropolitan[5]**	**2,056,000**	**1,947,000**	**2,003,000**	**2,059,000**	**2,119,000**

Notes:
All units are acre-feet unless specified, rounded the nearest thousand.
Totals may not sum due to rounding.
[1]Growth projections are based on SCAG 2007 Regional Transportation Plan and SANDAG Series 12 2050 Regional Growth Forecast (Feb 2010).
[2]Includes code-based, price-effect and existing active savings through 2009; does not include future active conservation savings. 1990 is base year.
[3]Replenishment Service as defined in MWD Administrative Code Section 4114. Replenishment service includes direct and in-lieu replenishment.
[4]IAWP deliveries will be phased out by 2013.
[5]Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands.

Table 2-8
Metropolitan Regional Water Demands
Average Year
(Acre-Feet)

		2015	2020	2025	2030	2035
A.	**Total Demands[1]**	**5,449,000**	**5,632,000**	**5,774,000**	**5,930,000**	**6,069,000**
	Retail Municipal and Industrial	4,978,000	5,170,000	5,330,000	5,491,000	5,627,000
	Retail Agricultural	222,000	205,000	186,000	179,000	180,000
	Seawater Barrier	71,000	72,000	72,000	72,000	72,000
	Groundwater Replenishment	178,000	185,000	187,000	189,000	191,000
B.	**Total Conservation**	**936,000**	**967,000**	**1,033,000**	**1,096,000**	**1,156,000**
	Existing Active (through 2009)[2]	97,000	46,000	16,000	2,000	0
	Code-based and Price-Effect	589,000	671,000	766,000	844,000	906,000
	Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
C.	**SBx7-7 Water Conservation**	**190,000**	**380,000**	**380,000**	**380,000**	**380,000**
	20% by 2020 Retail-Level Compliance	190,000	380,000	380,000	380,000	380,000
D.	**Total Local Supplies**	**2,395,000**	**2,522,000**	**2,553,000**	**2,581,000**	**2,603,000**
	Groundwater	1,429,000	1,430,000	1,429,000	1,431,000	1,431,000
	Surface Water	103,000	102,000	102,000	102,000	102,000
	Los Angeles Aqueduct	224,000	225,000	226,000	229,000	230,000
	Groundwater Recovery	101,000	108,000	114,000	120,000	126,000
	Total Recycling	348,000	375,000	394,000	410,000	426,000
	Other Imported Supplies	190,000	281,000	288,000	288,000	288,000
E.	**Total Metropolitan Demands (E=A-B-C-D)**	**1,928,000**	**1,763,000**	**1,808,000**	**1,874,000**	**1,931,000**
	Full Service (Tier I and Tier II)	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
	Replenishment Service[3]	102,000	103,000	103,000	104,000	105,000
	Interim Agricultural Water Program[4]	0	0	0	0	0
F.	**Firm Demands on Metropolitan[5]**	**1,826,000**	**1,660,000**	**1,705,000**	**1,769,000**	**1,826,000**

Notes:
All units are acre-feet unless specified, rounded the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2007 Regional Transportation Plan and SANDAG Series 12 2050 Regional Growth Forecast (Feb 2010).
[2] Includes code-based, price-effect and existing active savings through 2009; does not include future active conservation savings. 1990 is base year.
[3] Replenishment Service as defined in MWD Administrative Code Section 4114. Replenishment service includes direct and in-lieu replenishment.
[4] IAWP deliveries will be phased out by 2013.
[5] Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands.

2.3 Water Supply Reliability

After estimating demands for single dry year, multiple dry years, and average years the water reliability analysis requires urban water suppliers to identify projected supplies to meet these demands. Table 2-9 summarizes the sources of supply for the single dry year (1977 hydrology), while Table 2-10 shows the region's ability to respond in future years under a repeat of the 1990-92 hydrology. Table 2-10 provides results for the average of the three dry years rather than a year-by-year detail, because most of Metropolitan's dry-year supplies are designed to provide equal amounts of water over each year of a three-year period. These tables show that the region can provide reliable water supplies under both the single driest year and the multiple dry year hydrologies. Table 2-11 reports the expected situation on average over all of the historic hydrologies. Appendix A.3 contains detailed justifications for the sources of supply used for this analysis.

Metropolitan' s supply capabilities are evaluated using the following assumptions:

Colorado River Aqueduct Supplies

Colorado River Aqueduct supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement Agreement (QSA) and related agreements. The QSA, which is the subject of current litigation, is a component of the California Plan and establishes the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. A detailed discussion of the QSA is included in Section 3. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis.

State Water Project Supplies

State Water Project (SWP) supplies are estimated using the draft 2009 SWP Delivery Reliability Report distributed by DWR in December 2009. The draft 2009 reliability report presents the current DWR estimate of the amount of water deliveries for current (2009) conditions and conditions 20 years in the future. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service issued on December 15, 2008, and June 4, 2009, respectively. Under the 2009 draft reliability report, the delivery estimates for the SWP for current (2009) conditions as percentage of maximum Table A amounts, are seven percent, equivalent to 134 TAF, under a single dry-year (1977) condition and 60%, equivalent to 1.15 MAF, under long-term average condition.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley storage and transfer programs. Over the last two years under the pumping restrictions of the SWP, Metropolitan has worked collaboratively with the other contractors to develop numerous voluntary Central Valley storage and transfer programs. The goal of this storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

Delta Improvements

The listing of several fish species as threatened or endangered under the federal or California Endangered Species Acts (ESAs) have adversely impacted operations and limited the flexibility of the SWP. In response to court decisions related to the Biological Opinions for fish species listed under the ESAs, DWR altered the operations of the SWP. This resulted in export restrictions and reduced SWP deliveries. In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance

and the environment. The Delta Action Plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Bay-Delta while the long-term solution is implemented.

In the near-term, the physical and operational actions in the Bay-Delta being developed include measures that protect fish species and reduce supply impacts with the goal of reducing conflicts between water supply conveyance and environmental needs. The potential for Increased supply due to these near-term fixes is included in the 2010 RUWMP as a 10 percent increase in water supplies obtained from the SWP allocation for the year. In evaluating the supply capabilities for the 2010 RUWMP, additional supplies from this interim fix are assumed to materialize by 2013. Also included as a possible near-term fix for the Bay-Delta is the proposed Two-Gate System demonstration program, which would provide movable barriers on the Old and Middle Rivers to modify flows and prevent fish from being drawn toward the Bay-Delta pumping plants. The Two-Gate System is anticipated to protect fish and increase SWP supplies.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. State and federal resource agencies and various environmental and water user entities are currently engaged in the development of the Bay Delta Conservation Plan (BDCP), which is aimed at addressing the basic elements that include the Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In dealing with these basic issues, the ideal solutions sought are the ones that address both the physical changes required as well as the financing and governance. In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is fully operational by 2022 that would return supply reliability similar to 2005 condition, prior to supply restrictions imposed due to the Biological Opinions. This assumption is consistent with Metropolitan's long-term Delta Action Plan that recognizes the need for a global, comprehensive approach to the fundamental issues and conflicts to result in a sustainable Bay-Delta, sufficient to avoid biological opinion restrictions on planned SWP deliveries to Metropolitan and the other SWP Contractors. Further, recently passed state legislation included pathways for establishing governance structures and financing approaches to implement and manage the identified elements.

Storage

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. Storage is a major component of Metropolitan's dry-year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing the Water Supply Allocation plan (WSAP), is dependent on its storage resources.

In developing the supply capabilities for the 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used. All storage capability figures shown in the 2010 RUWMP reflect actual storage program conveyance constraints. It is important to note that under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet demands.

Table 2-9
Single Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	522,000	601,000	651,000	609,000	610,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,416,000	1,824,000	1,669,000	1,419,000	1,419,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,457,000**	**2,782,000**	**2,977,000**	**2,823,000**	**2,690,000**
Demands					
Firm Demands of Metropolitan	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,171,000**	**2,162,000**	**2,201,000**	**2,254,000**	**2,319,000**
Surplus	**286,000**	**620,000**	**776,000**	**569,000**	**371,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	556,000	556,000	700,000	700,000	700,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**762,000**	**862,000**	**1,036,000**	**1,036,000**	**1,036,000**
Potential Surplus	**1,048,000**	**1,482,000**	**1,812,000**	**1,605,000**	**1,407,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-10
Multiple Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1990-1992 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	246,000	373,000	435,000	398,000	353,000
California Aqueduct[2]	752,000	794,000	835,000	811,000	812,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,318,000	1,600,000	1,417,000	1,416,000	1,416,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,248,000**	**2,417,000**	**2,520,000**	**2,459,000**	**2,415,000**
Demands					
Firm Demands of Metropolitan	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
IID-SDCWA Transfers and Canal Linings	180,000	241,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,236,000**	**2,188,000**	**2,283,000**	**2,339,000**	**2,399,000**
Surplus	**12,000**	**229,000**	**237,000**	**120,000**	**16,000**
Programs Under Development					
In-Region Storage and Programs	162,000	280,000	314,000	336,000	336,000
California Aqueduct	242,000	273,000	419,000	419,000	419,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**404,000**	**553,000**	**733,000**	**755,000**	**755,000**
Potential Surplus	**416,000**	**782,000**	**970,000**	**875,000**	**771,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-11
AverageYear
Supply Capability[1] and Projected Demands
Average of 1922-2004 Hydrologies
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	1,550,000	1,629,000	1,763,000	1,733,000	1,734,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,507,000	1,529,000	1,472,000	1,432,000	1,429,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**3,485,000**	**3,810,000**	**4,089,000**	**3,947,000**	**3,814,000**
Demands					
Firm Demands of Metropolitan	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,006,000**	**1,933,000**	**1,985,000**	**2,049,000**	**2,106,000**
Surplus	**1,479,000**	**1,877,000**	**2,104,000**	**1,898,000**	**1,708,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	382,000	383,000	715,000	715,000	715,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**588,000**	**689,000**	**1,051,000**	**1,051,000**	**1,051,000**
Potential Surplus	**2,067,000**	**2,566,000**	**3,155,000**	**2,949,000**	**2,759,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

2.4 Water Shortage Contingency Analysis

In addition to the Water Supply Reliability analysis addressing average year and drought conditions, the Act requires agencies to document the stages of actions that it would undertake in response to water supply shortages, including up to a 50 percent reduction in its water supplies. Metropolitan has captured this planning in its Water Surplus and Drought Management Plan (WSDM Plan) which guides Metropolitan's planning and operations during both shortage and surplus conditions. Furthermore, Metropolitan developed the WSAP which provides a standardized methodology for allocating supplies during times of shortage.

Water Surplus and Drought Management Plan

In April 1999, Metropolitan's Board adopted the Water Surplus and Drought Management Plan (WSDM Plan) [3], included in Appendix A.4. It provides policy guidance for managing regional water supplies to achieve the reliability goals of the IRP and identifies the expected sequence of resource management actions that Metropolitan will execute during surpluses and shortages to minimize the probability of severe shortages and reduce 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.

WSDM Plan Development

Metropolitan and its member agencies jointly developed the WSDM Plan during 1998 and 1999. This planning effort included more than a dozen half-day and full-day workshops and more than three dozen meetings between Metropolitan and member agency staff. The result of the planning effort is a consensus plan that addresses a broad range of regional water management actions and strategies.

WSDM Plan Principles and Goals

The guiding principle of the WSDM plan is to manage Metropolitan's water resources and management programs to maximize management of wet year supplies and minimize adverse impacts of water shortages to retail customers. From this guiding principle came the following supporting principles:

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

The WSDM plan also declared that if mandatory import water allocations become necessary, they would be calculated on the basis of need, as opposed to any type of historical purchases. The WSDM plan contains the following considerations that would go into an equitable allocation of imported water:

- Impact on retail consumers and regional economy
- Investments in local resources, including recycling and conservation
- Population growth
- Changes and/or losses in local supplies
- Participation in Metropolitan's Non-firm (interruptible) programs
- Investment in Metropolitan's facilities

WSDM Plan Implementation

Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage. Each stage is associated with specific resource

[3] Metropolitan Water District of Southern California. *Water Surplus and Drought Management Plan,* Report No. 1150, August, 1999.

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. The WSDM Plan further defines five surplus management stages that guide the storage of surplus supplies in Metropolitan's storage portfolio. Deliveries for storage in the DVL and in the SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL 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 Stages

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

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 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.

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, exercising water transfer options, or purchasing water on the open market.

Figure 2-2 shows the actions under surplus and shortage stages when an allocation plan would be necessary to enforce mandatory cutbacks. The overriding goal of the WSDM Plan is to never reach Shortage Stage 7, an Extreme Shortage.

At shortage stage 7 Metropolitan will implement its Water Supply Allocation Plan[4] (WSAP) to allocate available supply fairly and efficiently to full-service customers.

Water Supply Allocation Plan

In February 2008 Metropolitan's Board adopted the WSAP. The WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation.

The WSAP was developed in consideration of the principles and guidelines described in the

[4] Metropolitan Water District of Southern California, Water Supply Allocation Plan, June 2009.

WSDM Plan, with the objective of creating an equitable needs-based allocation. The WSAP formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account growth, local investments, changes in supply conditions and the demand hardening aspects of non-potable recycled water use and the implementation of conservation savings programs.

Water Supply Allocation Plan Development

Between July 2007 and February 2008, Metropolitan staff worked jointly with Metropolitan's member agencies to develop the WSAP. Throughout the development process Metropolitan's Board was provided with regular progress reports on the status of the WSAP The WSAP was adopted at the February 12, 2008 Board meeting.

The WSAP Formula

The WSAP formula is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

Step 1: Base Period Calculations

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

Step 2: Allocation Year Calculations

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

Step 3: Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula is discussed in detail in Metropolitan's Water Supply Allocation Plan.[5]

Annual Reporting Schedule on Supply/ Demand Conditions

Managing Metropolitan's water supply resources to minimize the risk of shortages requires timely and accurate information on changing supply and demand conditions throughout the year. To facilitate effective resource management decisions, the WSDM Plan includes a monthly schedule for providing supply/demand information to Metropolitan's senior management and Board, and for making resource allocation decisions. Table 2-12 shows this schedule.

[5] Metropolitan Water District of Southern California, Water Supply Allocation Plan, June 2009.

Figure 2-2 Resource Stages, Anticipated Actions, And Supply Declarations

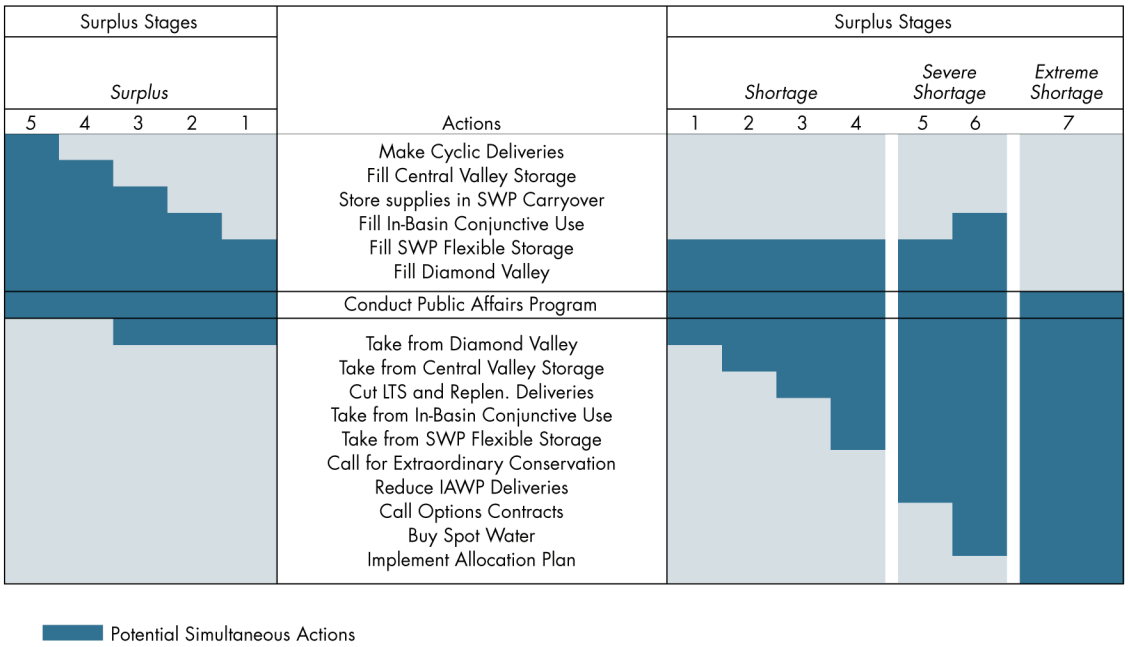

Table 2-12
Schedule of Reporting and Resource Allocation Decision-Making

Month	Information Report/Management Decision
January	Initial supply/demand forecasts for year
February - March	Update supply/demand forecasts for year
April - May	Finalize supply/demand forecasts Management decisions re: Contractual Groundwater and Option Transfer Programs Board decision re: Need for Extraordinary Conservation
October - December	Report on Supply and Carryover Storage
October	Management decisions re: Delivery Interruptions for the Replenishment and Interim Agricultural Water Programs

2.5 Catastrophic Supply Interruption Planning

The third type of planning needed to evaluate supply reliability is a catastrophic supply interruption plan that documents the actions necessary for a catastrophic interruption in water supplies. For Metropolitan this planning is captured in the analysis that went into developing the Emergency Storage Requirements.

Emergency Storage Requirements

Metropolitan established its criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board has approved both of these documents.

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. Therefore, Metropolitan has based its planning on a 100 percent reduction in its supplies for a period of six months, which is 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, non-firm 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 up to half of DVL 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.

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 regional reservoirs such as DVL, Lake Mathews, Castaic Lake and Silverwood 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.

2.6 Other Supply Reliability Risks

Metropolitan provides water to a broad and heterogeneous service area with water supplies from a variety of sources and geographic regions. Each of these demand areas and supplies has its own unique set of benefits and challenges. Among the challenges Metropolitan faces are the following:

Supplies

- The region and Colorado River Basin have been experiencing drought conditions for multiple years.
- Endangered species protections and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints particularly important because pumping restrictions impact many water resource programs – SWP supplies and additional voluntary transfers, Central Valley storage and transfers, in-region groundwater storage and in-region surface water storage.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Difficulty and implications of environmental review, documentation, and permitting for multi-year transfer agreements, recycled water projects and seawater desalination plants.
- Public perception of recycled water use for replenishment.

Operations and Water Quality

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues like the quagga mussels within the Colorado River Aqueduct. Controlling the spread and impacts of the quagga mussels will require more extensive maintenance and reduced operational flexibility.
- Salt and concentrate balance from variety of sources.

Demand

- Uncertain population and economic growth
- Uncertain location of growth
- Uncertain housing stock and density

The challenges posed by continued population growth, environmental constraints on the reliability of imported supplies, and new uncertainties imposed by climate change demand that Metropolitan assert the same level of leadership and commitment to taking on large-scale regional solutions to providing water supply reliability. New solutions are available in the form of dramatically improved water-use efficiency, indirect potable use of recycled water, and large-scale application of ocean desalinization.

Climate Change

Climate change adds its own new uncertainties to the challenges of planning. Metropolitan's water supply planning has been fortunate in having almost one-hundred years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. But, weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere, as experienced in Australia. These changes in weather significantly affect water supply planning, irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gasses. As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change.

Potential Impacts

While uncertainties remain regarding the exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners. These include:

- Reduction in Sierra Nevada snowpack;
- Increased intensity and frequency of extreme weather events; and
- Rising sea levels resulting in
  - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
  - Potential pumping cutbacks on the SWP and Central Valley Project (CVP).

Other important issues of concern due to global climate change include:

- Effects on local supplies such as groundwater;
- Changes in urban and agricultural demand levels and patterns ;
- Impacts to human health from water-borne pathogens and water quality degradation;
- Declines in ecosystem health and function; and
- Alterations to power generation and pumping regimes.

Metropolitan's Activities Related to Climate Change Concerns

An extended Colorado River drought put climate change on Metropolitan's radar screen in the mid-1990s. In 2000, Metropolitan's Board received a briefing on the potential impacts of climate change on water supply by leading experts in the field. Metropolitan then hosted a California Water Plan meeting on climate change and a held Drought Preparedness Workshop on similar issues. In March 2002, the Board adopted policy principles on global climate change as related to water resource planning. The Principles stated in part that 'Metropolitan supports further research into the potential water resource and quality effects of global climate change, and supports flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts.'

<u>Knowledge Sharing and Research Support</u>
Metropolitan is an active and founding member of the Water Utility Climate Alliance (WUCA). WUCA consists of ten nationwide water providers collaborating on climate change adaptation and green house gas mitigation issues. As a part of this effort, WUCA pursues a variety of activities on multiple fronts.

WUCA monitors development of climate change-related research, technology, programs and federal legislation. Activities to date include such things as:

- Letter of support for Western Water Assessment's continued funding as a Regional Integrated Sciences and Assessments team under the National Oceanic and Atmospheric Administration (NOAA)
- Letter of support for the 2009 Kerry-Boxer Water Utilities Mitigation and Adaptation Partnerships congressional bill addendum
- Regular communication and consultations with federal agencies on the U.S. Environmental Protection Agency's Climate Ready Water Utility Working Group
- NOAA Climate Service and January 2010 International Climate Change Forum

In addition to supporting federal and regional efforts, WUCA released a white paper entitled "Options for Improving Climate Modeling to Assist Water Utility Planning for Climate Change" in January 2010. The purpose of this paper was to assess Global Circulation Models, identify key aspects for water utility planning and make seven initial recommendations for how climate modeling

and downscaling techniques can be improved so that these tools and techniques can be more useful for the water sector.

In order to address water provider-specific needs, WUCA has focused not only on climate change science and Global Circulation Models, but on how best to incorporate that knowledge into water planning. This was explored more thoroughly in a second January 2010 white paper on decision support methods for incorporating climate change uncertainty into water planning. This paper assessed five known decision support approaches for applicability in incorporating Climate Change uncertainty in water utility planning and identified additional research needs in the area of decision support methodologies.

In addition to these efforts, the member agencies of WUCA annually share individual agency actions to mitigate greenhouse gas emissions to facilitate further implementation of these programs. At a September 2009 summit at the Aspen Global Change Institute WUCA, members met with global climate modelers, along with federal agencies, academic scientists, and climate researchers to establish collaborative directions to progress climate science and modeling efforts. WUCA continues to pursue these opportunities and partnerships with water providers, climate scientists, federal agencies, research centers, academia and key stakeholders.

Metropolitan also continues to pursue knowledge sharing and research support activities outside of WUCA. Metropolitan regularly provides input and direction on California legislation related to climate change issues. Metropolitan is active in collaborating with other state and federal agencies, as well as non-governmental organizations on climate change related planning issues. The following list provides a sampling of entities that Metropolitan has recently worked with on a collaborative basis:

- U.S. Bureau of Reclamation
- U.S. Army Corps of Engineers
- American Water Works Association Research Foundation
- National Center for Atmospheric Research
- California Energy Commission
- California Department of Water Resources

<u>Quantification of Current Research</u>

Metropolitan continues to incorporate current climate change science into its planning efforts. A major component of the current IRP update effort is to explicitly reflect uncertainty in Metropolitan's future water management environment. This involves evaluating a wider range of water management strategies, and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, will be incorporated into the update and accounted. Overall, Metropolitan's planning activities strive to support the Board adopted policy principles on climate change by:

- Supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply
- Supporting flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts, and

- Evaluating staff recommendations regarding climate change and water resources against the California Environmental Quality Act (CEQA) to avoid adverse effects on the environment.

Implementation of Programs and Policies
Metropolitan has made great efforts to implement greenhouse gas mitigation programs and policies for its facilities and operations. To date, these programs and policies have focused on:

- Exploring water supply/energy relationships and opportunities to increase efficiencies;
- Joining the California Climate Action Registry;
- Acquiring "green" fleet vehicles, and supporting an employee Rideshare program;
- Developing solar power at the Skinner water treatment plant; and
- Identifying and pursuing development of "green" renewable water and energy programs that support the efficient and sustainable use of water.

Metropolitan also continues to be a leader in efforts to increase regional water use efficiency. Metropolitan has worked to increase the availability of incentives for local conservation and recycling projects, as well as supporting conservation Best Management Practices for industry and commercial businesses.

2.7 Pricing and Rate Structures

Revenue Management

A high proportion of Metropolitan's revenues come from volumetric water rates; during the last five fiscal years through 2008-09, water sales revenues were approximately 75 percent of Metropolitan's total revenues. As a result, Metropolitan's revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 1991 and 2009 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and maximum balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales.

Another way to mitigate rate increases is by generating a larger portion of revenues from fixed sources. Metropolitan currently has two fixed charges, the Readiness-to-Serve Charge and the Capacity Charge. Metropolitan also collects tax revenue from taxable property within its boundaries. For the last five fiscal years the revenues from fixed charges generated almost 18 percent of all Metropolitan revenues. RTS revenues have been increasing gradually, from $80 million in 2007, to $114 million in 2010, $125 million in 2011, and $146 million in 2012.

Finally, Metropolitan generates a significant amount of revenue from interest income, hydroelectric power sales, and miscellaneous income such as rents and leases. For the last five fiscal years, these averaged almost 7 percent of all Metropolitan revenues. These internally generated revenues are referred to as revenue offsets and reduce the amount of revenue that has to be collected from rates and charges.

Elements of Rate Structure

This section provides an overview of Metropolitan's rate structure. The different elements of the rate structure are discussed below and summarized in Table 2-13.

System Access Rate (SAR)

The SAR is a volumetric system-wide rate levied on each acre-foot of water that moves through the Metropolitan system. All system users (member agency or third party) pay the SAR to use Metropolitan's conveyance and distribution system. The SAR recovers the cost of providing conveyance and distribution capacity to meet average annual demands.

Water Stewardship Rate (WSR)

The WSR recovers the costs of providing financial incentives for existing and future investments in local resources including conservation and recycled water. These investments or incentive payments are identified as the "demand management" service function in the cost of service process. The WSR is a volumetric rate levied on each acre-foot of water that moves through the Metropolitan system.

System Power Rate (SPR)

The SPR recovers the costs of energy required to pump water to Southern California through the SWP and Colorado River Aqueduct. The cost of power is recovered through a uniform volumetric rate. The SPR is applied to all deliveries to member agencies.

Treatment Surcharge

The treatment surcharge recovers the costs of providing treated water service through a uniform, volumetric rate. The treatment surcharge recovers all costs associated with providing treated water service, including commodity, demand and standby related costs.

Capacity Charge

The capacity charge is levied on the maximum summer day demand placed on the system between May 1 and September 30 for a three-calendar year period. Demands measured for the purposes of billing the capacity charge include all firm demand and agricultural demand, including wheeling service and exchanges. Replenishment service is not included in the measurement of peak day demand for purposes of billing the capacity charge.

The capacity charge is intended to pay for the cost of peaking capacity on Metropolitan's system, while providing an incentive for local agencies to decrease their use of the Metropolitan system to meet peak day demands and to shift demands into lower use time periods. Over time, a member agency will benefit from local supply investments and operational strategies that reduce its peak day demand on the system in the form of a lower total capacity charge.

Readiness-To-Serve Charge (RTS)

The costs of providing standby service, including emergency storage and those standby costs related to the conveyance and aqueduct system, are recovered by the RTS.

The RTS is allocated to the member agencies based on each agency's proportional share of a ten-year rolling average of all firm deliveries (including water transfers and exchanges that use Metropolitan system capacity). The ten-year rolling average does not include replenishment service and interim agricultural deliveries because these deliveries will be the first to be curtailed in the event of an emergency. A ten-year rolling average leads to a relatively stable RTS allocation that reasonably represents an agency's potential long-term need for standby service under different demand conditions. Member agencies may choose to have a portion of their total RTS obligation offset by standby charge collections levied by Metropolitan on behalf of the member agency. These standby charges are assessed on parcels of land within the boundaries of a given member agency.

Tier 1 Supply Rate

The costs of maintaining existing supplies and developing additional supplies are recovered through a two-tiered pricing approach. The Tier 1 Supply Rate recovers the majority of the supply costs and reflects the cost of existing supplies. Each member agency has a predetermined amount of water that can be purchased at the lower Tier 1 Supply Rate in a calendar year. Purchases in excess of this limit will be made at the higher Tier 2 Supply Rate.

The Tier 1 Supply rate includes a Delta Supply Surcharge of $69 per AF in 2010, $51 per AF in 2011 and $58 per AF in 2012. This surcharge reflects the impact on Metropolitan's water supply rates due to lower deliveries from the SWP as a result of pumping restrictions designed to protect endangered fish species. The Delta Supply Surcharge will remain in effect until a long-term solution for the delta was achieved or until interim facility improvements restore SWP yield.

Tier 2 Supply Rate

The Tier 2 Supply Rate reflects Metropolitan's cost of developing long-term firm supplies. The Tier 2 Supply Rate recovers a greater proportion of the cost of developing additional supplies from member agencies that have increasing demands on the Metropolitan system.

Replenishment Program and Agricultural Water Program

Metropolitan currently administers two pricing programs that make surplus system supplies (system supplies in excess of what is needed to meet consumptive municipal and industrial demands) available to the member agencies at a discounted water rate. The Replenishment Program provides supplies, when available, for the purpose of replenishing local storage. The Interim Agricultural Water Program (IAWP) makes surplus water available for agricultural purposes. In October 2008, the Board

approved a phase out of the IAWP by 2013. Because of the critically dry conditions and uncertainty about future supply, discounted replenishment deliveries have been curtailed for the past three years. If water supply conditions improve and surplus water becomes available, Metropolitan could make Replenishment service available to its member agencies at discounted rates, subject to meeting Metropolitan's storage objectives to meet full service demands.

Table 2-13
Rate Structure Components

Rate Design Elements	Service Provided/ Costs Recovered	Type of Charge
System Access Rate	Conveyance/Distribution (Average Capacity)	Volumetric ($/AF)
Water Stewardship Rate	Conservation/Local Resources	Volumetric ($/AF)
System Power Rate	Power	Volumetric ($/AF)
Treatment Surcharge	Treatment	Volumetric ($/AF)
Capacity Charge	Peak Distribution Capacity	Fixed/Volumetric ($/cfs)
Readiness-To-Serve Charge	Conveyance/Distribution/Emergency Storage(Standby Capacity)	Fixed ($Million)
Tier 1 Supply Rate	Supply	Volumetric/Fixed ($/AF)
Tier 2 Supply Rate	Supply	Volumetric ($/AF)
Surplus Water Rates	Replenishment/Agriculture	Volumetric ($/AF)

The following tables provide further information regarding Metropolitan's rates. Table 2-14 summarizes the rates and charges effective January 1, 2010, January 1, 2011, and January 1, 2012. Average costs by member agency will vary depending upon an agency's RTS allocation, Capacity Charge and relative proportions of treated and untreated Tier 1, Tier 2, replenishment, and agricultural water purchases. Table 2-15 provides the details of the Capacity Charge, calculated for calendar year 2011. Table 2-16 provides the details of the Readiness-to-Serve Charge calculation for calendar year 2011 broken down by member agency. Table 2-17 provides the current Purchase Order commitment quantities that member agencies will purchase from Metropolitan over the 10-year period starting January 2003 through December 2012. Tier 1 limits for each member agency are also shown in this table.

Table 2-14
Metropolitan Water Rates and Charges

Effective	Jan 1, 2010	Jan 1, 2011	Jan 1, 2012
Tier 1 Supply Rate ($/AF)	$101	$104	$106
Delta Supply Surcharge ($/AF)	$69	$51	$58
Tier 2 Supply Rate ($/AF)	$280	$280	$290
System Access Rate ($/AF)	$154	$204	$217
Water Stewardship Rate ($/AF)	$41	$41	$43
System Power Rate ($/AF)	$119	$127	$136
Full Service Untreated Volumetric Cost ($/AF)			
Tier 1	$484	$527	$560
Tier 2	$594	$652	$686
Replenishment Water Rate Untreated ($/AF)	$366	$409	$442
Interim Agricultural Water Program Untreated ($/AF)	$416	$482	$537
Treatment Surcharge ($/AF)	$217	$217	$234
Full Service Treated Volumetric Cost ($/AF)			
Tier 1	$701	$744	$794
Tier 2	$811	$869	$920
Treated Replenishment Water Rate ($/AF)	$558	$601	$651
Treated Interim Agricultural Water Program ($/AF)	$615	$687	$765
Readiness-to-Serve Charge ($M)	$114	$125	$146
Capacity Charge ($/cfs)	$7,200	$7,200	$7,400

Table 2-15
Capacity Charge Detail

	Peak Day Demand (cfs) (May 1 through September 30) Calendar Year				
Agency	2007	2008	2009	3-Year Peak	Calendar Year 2011 Capacity Charge ($7,200/cfs)
Anaheim	37.9	36.1	40.7	40.7	$ 293,040
Beverly Hills	33.9	32.9	31.0	33.9	244,080
Burbank	33.7	34.2	21.6	34.2	246,240
Calleguas	260.8	250.0	192.8	260.8	1,877,760
Central Basin	125.9	102.7	94.7	125.9	906,480
Compton	7.1	4.9	5.9	7.1	51,120
Eastern	303.0	263.1	227.8	303.0	2,181,600
Foothill	25.4	21.5	24.3	25.4	182,880
Fullerton	36.9	27.1	37.4	37.4	269,280
Glendale	54.6	55.7	56.0	56.0	403,200
Inland Empire	176.2	125.8	106.1	176.2	1,268,640
Las Virgenes	45.3	45.3	42.7	45.3	326,160
Long Beach	61.3	68.1	67.2	68.1	490,320
Los Angeles	768.5	821.9	698.2	821.9	5,917,680
MWDOC	469.2	453.7	489.5	489.5	3,524,400
Pasadena	58.5	55.6	50.2	58.5	$421,200
San Diego [1]	1278.4	1039.9	1055.3	1278.4	9,204,480
San Fernando	6.5	0.1	0.0	6.5	$46,800
San Marino	5.2	5.2	3.5	5.2	$37,440
Santa Ana	29.7	14.5	16.4	29.7	213,840
Santa Monica	27.6	26.2	25.0	27.6	198,720
Three Valleys	171.4	168.1	132.7	171.4	1,234,080
Torrance	41.6	35.5	39.3	41.6	299,520
Upper San Gabriel	63.8	36.9	27.6	63.8	459,360
West Basin	262.3	243.3	221.3	262.3	1,888,560
Western	289.1	271.4	219.9	289.1	2,081,520
Total	**4,673.8**	**4,239.7**	**3,927.1**	**4,759.5**	**$ 34,268,400**

Totals may not foot due to rounding

Table 2-16
Readiness-to-Serve Charge (by Member Agency)
Calendar Year 2011 RTS charge

Member Agency	Rolling Ten-Year Average Firm Deliveries (Acre-Feet) FY1999/00 - FY2008/09	RTS Share	12 months @ $125 million per year (1/11-12/11)
Anaheim	20,966	1.11%	$ 1,382,122
Beverly Hills	12,737	0.67%	839,692
Burbank	12,908	0.68%	850,938
Calleguas MWD	113,610	5.99%	7,489,554
Central Basin MWD	63,256	3.34%	4,170,058
Compton	3,146	0.17%	207,408
Eastern MWD	92,013	4.85%	6,065,789
Foothill MWD	11,570	0.61%	762,706
Fullerton	9,694	0.51%	639,087
Glendale	24,150	1.27%	1,592,015
Inland Empire Utilities Agency	61,205	3.23%	4,034,823
Las Virgenes MWD	23,282	1.23%	1,534,813
Long Beach	36,970	1.95%	2,437,211
Los Angeles	314,757	16.60%	20,749,798
Municipal Water District of Orange County	231,692	12.22%	15,273,878
Pasadena	23,397	1.23%	1,542,428
San Diego County Water Authority	491,238	25.91%	32,384,010
San Fernando	119	0.01%	7,819
San Marino	1,001	0.05%	65,963
Santa Ana	12,743	0.67%	840,028
Santa Monica	12,794	0.67%	843,429
Three Valleys MWD	73,095	3.85%	4,818,678
Torrance	20,742	1.09%	1,367,401
Upper San Gabriel Valley MWD	15,631	0.82%	1,030,447
West Basin MWD	141,522	7.46%	9,329,606
Western MWD	71,906	3.79%	4,740,301
MWD Total	**1,896,143**	**100.00%**	**$ 125,000,000**

Totals may not foot due to rounding

Table 2-17
Purchase Order Commitments and Tier 1 Limits
(by Member Agency)

	2011 Tier 1 Limit with Opt-outs	Purchase Order Commitment (acre-feet)
Anaheim	22,240	148,268
Beverly Hills	13,380	89,202
Burbank	16,336	108,910
Calleguas	110,249	692,003
Central Basin	72,361	482,405
Compton	5,058	33,721
Eastern	87,740	504,664
Foothill	10,997	73,312
Fullerton	11,298	75,322
Glendale	26,221	174,809
Inland Empire	59,792	398,348
Las Virgenes	21,087	137,103
Long Beach	39,471	263,143
Los Angeles	304,970	2,033,132
MWDOC	228,130	1,486,161
Pasadena	21,180	141,197
San Diego	547,239	3,342,571
San Fernando	630	-
San Marino	1,199	-
Santa Ana	12,129	80,858
Santa Monica	11,515	74,062
Three Valleys	70,474	469,331
Torrance	20,967	139,780
Upper San Gabriel	16,512	110,077
West Basin	156,874	1,045,825
Western	69,720	391,791
Total	**1,957,768**	**12,495,995**

Totals may not foot due to rounding.

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Water Quality 4

Metropolitan's planning efforts have recognized the importance of the quality of its water supplies. To the extent possible, Metropolitan responds to water quality concerns by concentrating on protecting the quality of the source water and developing water management programs that maintain and enhance water quality. Contaminants that cannot be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending. These practices can increase costs and/or reduce operating flexibility and safety margins. In addition, Metropolitan has developed enhanced security practices and policies in response to national security concerns.

Background

Implementing the major components of Metropolitan's planning efforts – groundwater storage, recycled water, and minimized impacts on the Delta – requires meeting specific water quality targets for imported water. Metropolitan has two major sources of water: the Colorado River and the State Water Project (SWP). Groundwater inflows are also received into the SWP through groundwater banking programs in the Central Valley. Each source has specific quality issues, which are summarized in this section. To date, Metropolitan has not identified any water quality risks that cannot be mitigated. As described in this section, the only potential effect of water quality on the level of water supplies based on current knowledge could result from increases in the salinity of water resources. If diminished water quality caused a need for membrane treatment, Metropolitan could experience losses of up to 15 percent of the water processed. However, Metropolitan would only process a small proportion of the affected water and would reduce total salinity by blending the processed water with the remaining unprocessed water. Thus, Metropolitan anticipates no significant reductions in water supply availability from these sources due to water quality concerns over the study period.

Colorado River

High salinity levels represent a significant issue associated with Colorado River supplies. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate and Chromium VI, which are discussed later in this chapter. Metropolitan has also been active in efforts to protect these supplies from potential increases in nutrient loading due to urbanization, as well as investigating the sources and occurrence of constituents of emerging concern, such as N-nitrosodimethylamine (NDMA) and pharmaceuticals and personal care products (PPCPs). Metropolitan fully expects its source water protection efforts to be successful, so the only foreseeable water quality constraint to the use of Colorado River water will be the need to blend (mix) it with SWP supplies to meet the adopted salinity standards.

State Water Project

The key water quality issues on the SWP are disinfection byproduct precursors, in particular, total organic carbon and bromide. Metropolitan is working to protect the water quality of this source, but it has needed to upgrade its water treatment

plants to deal adequately with disinfection byproducts. Disinfection byproducts result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plant, and they may place some near term restrictions on Metropolitan's ability to use SWP water. Metropolitan expects these treatment restrictions to be overcome through the addition of ozone disinfection at its treatment plants. Arsenic is also of concern in some groundwater storage programs. Groundwater inflows into the California Aqueduct are managed to comply with regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels are significantly higher in the SWP system than within the Colorado River, leading to the potential for algal related concerns that can affect water management strategies. Metropolitan is engaged in efforts to protect the quality of SWP water from potential increases in nutrient loading from wastewater treatment plants. Also, as in the Colorado River watershed, Metropolitan is active in studies on the occurrence, sources, and fate and transport of constituents of emerging concern, such as NDMA and PPCPs.

Local Agency Supplies and Groundwater Storage

New standards for contaminants, such as arsenic, and other emerging standards may add costs to the use of groundwater storage and may affect the availability of local agency groundwater sources. These contaminants are not expected to affect the availability of Metropolitan supplies, but they may affect the availability of local agency supplies, which could in turn affect the level of demands on Metropolitan supplies if local agencies abandon supplies in lieu of treatment options. Metropolitan has not analyzed the effect that many of these water quality issues could have on local agency supply availability. There have, however, been some investigations into the supply impacts of perchlorate groundwater contamination as indicated later in this section.

In summary, the major regional concerns include the following:

- Salinity
- Perchlorate
- Total organic carbon and bromide (disinfection byproduct precursors)
- Nutrients (as it relates to algal productivity)
- Arsenic
- Uranium
- Chromium VI
- N-nitrosodimethylamine (NDMA)
- Pharmaceuticals and personal care products (PPCPs)

Metropolitan has taken several actions and adopted programs to address these contaminants and ensure a safe and reliable water supply. These actions, organized by contaminant, are discussed below. Another constituent previously identified in the 2005 RUWMP as a regional concern, methyl tertiary-butyl ether (MTBE), is now a decreasing concern due to the elimination of this chemical as a gasoline additive in California. This is also further discussed below, along with other water quality programs that Metropolitan has been engaged in to protect its water supplies.

Issues of Concern

Salinity

Imported water from the Colorado River has high salinity levels, so it must be blended (mixed) with lower-salinity water from the SWP to meet salinity management goals. Higher salinity levels in either Colorado River water or groundwater would increase the proportion of SWP supplies required to meet the adopted imported water salinity objectives. Metropolitan adopted an imported water salinity goal because higher salinity could increase costs and reduce operating flexibility. For example,

1. If diminished water quality causes a need for membrane treatment, the process typically results in losses of up to 15 percent of the water processed. These losses result both in an increased requirement for additional water supplies and environmental constraints related to brine disposal. In addition, the process is costly. However, only a portion of the imported water would need to be processed, so the possible loss in supplies is small.
2. High total dissolved solids (TDS) in water supplies leads to high TDS in wastewater, which lowers the usefulness and increases the cost of recycled water.
3. Degradation of imported water supply quality could limit the use of local groundwater basins for storage because of standards controlling the quality of water added to the basins.

In addition to the link between water supply and water quality, Metropolitan has identified economic benefits from reducing the TDS concentrations of water supplies. Estimates show that a simultaneous reduction in salinity concentrations of 100 milligrams per liter (mg/L) in both the Colorado River and SWP supplies will yield economic benefits of $95 million per year within Metropolitan's service territory.[1] This estimate has added to Metropolitan's incentives to reduce salinity concentrations within the region's water supplies.

For all of these reasons, Metropolitan's Board approved a Salinity Management Policy on April 13, 1999. The policy set a goal of achieving salinity concentrations in delivered water of less than 500 mg/L TDS. The Salinity Management Policy is further discussed later in this section.

Within Metropolitan's service area, local water sources account for approximately half of the salt loading, and imported water accounts for the remainder. All of these sources must be managed appropriately to sustain water quality and supply reliability goals. The following sections discuss the salinity issues relevant to each of Metropolitan's major supply sources.

Colorado River

Water imported via the Colorado River Aqueduct (CRA) has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 630 mg/L since 1976. Concern over salinity levels in the Colorado River has existed for many years. To deal with the concern, the International Boundary and Water Commission approved Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River in 1973, and the President approved the Colorado River Basin Salinity Control Act in 1974. High TDS in the Colorado River as it entered Mexico and the concerns of the seven basin states regarding the quality of Colorado River water in the United States drove these initial actions. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum).

The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. The Colorado River Basin Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system. The program targets the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs.

The Forum proposed, the states adopted, and the U. S. Environmental Protection Agency (USEPA) approved water quality standards in 1975, including numeric criteria and a plan for controlling salinity increases. The standards require that the plan ensure that the flow-weighted average annual salinity remain at or below the 1972 levels,

[1] Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

while the Basin states continue to develop their 1922 Colorado River Compact-apportioned water supply. The Forum selected three stations on the main stream of the lower Colorado River as appropriate points to measure the river's salinity. These stations and numeric criteria are (1) below Hoover Dam, 723 mg/l; (2) below Parker Dam, 747 mg/l; and (3) at Imperial Dam, 879 mg/l. The numeric criteria are flow-weighted average annual salinity values.

By some estimates, concentrations of salts in the Colorado River cause approximately $353 million in quantified damages in the lower Basin each year. The salinity control program has proven to be very successful and cost-effective. Salinity control projects have reduced salinity concentrations of Colorado River water on average by over 100 mg/L or $264 million per year (2005 dollars) in avoided damages.

During the high water flows of 1983-1986, salinity levels in the CRA dropped to a historic low of 525 mg/L. However, during the 1987-1992 drought, higher salinity levels of 600 to 650 mg/L returned. TDS in Lake Havasu was measured at 628 mg/L in November 2009.

State Water Project

Water supplies from the SWP have significantly lower TDS concentrations than the Colorado River, averaging approximately 250 mg/L in water supplied through the East Branch and 325 mg/L on the West Branch over the long-term, with short term variability as a result of hydrologic conditions.[2] Because of this lower salinity, Metropolitan blends SWP water with high salinity CRA water to reduce the salinity concentrations of delivered water. However, both the supply and the TDS concentrations of SWP water can vary significantly in response to hydrologic conditions in the Sacramento-San Joaquin watersheds.

As indicated above, the TDS concentrations of SWP water can vary widely over short periods of time. These variations reflect seasonal and tidal flow patterns, and they pose an additional problem for use of blending as a management tool to lower the higher TDS from the CRA supply. For example, in the 1977 drought, the salinity of SWP water reaching Metropolitan increased to 430 mg/L, and supplies became limited. During this same event, salinity at the SWP's Banks pumping plant exceeded 700 mg/L. Under similar circumstances, Metropolitan's 500 mg/L salinity objective could only be achieved by reducing imported water from the CRA. Thus, it may not always be possible to maintain both the salinity objective and water supply reliability unless salinity concentrations of source supplies can be reduced.

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

TDS objectives in Article 19 of the SWP Water Service Contract specify a ten-year average of 220 mg/L and a maximum monthly average of 440 mg/L. These objectives have not been met, and Metropolitan is working with DWR and other agencies on programs aimed at reducing salinity in Delta supplies. These programs aim to improve salinity on the San Joaquin River through modifying agricultural drainage and developing comprehensive basin plans. In addition, studies are underway to evaluate the benefits in reduced salinity of modifying levees in Franks Tract and other flooded islands in the Delta, or by placing operable gates in

[2] The higher salinity in the West Branch deliveries is due to salt loadings from local streams, operational conditions, and evaporation at Pyramid and Castaic Lakes.

strategic locations to impede transport of seawater derived salt.

Recycled Water

Wastewater flows always experience significantly higher salinity concentrations than the potable water supply. Typically, each cycle of urban water use adds 250 to 400 mg/L of TDS to the wastewater. Salinity increases tend to be higher where specific commercial or industrial processes add brines to the discharge stream or where brackish groundwater infiltrates into the sewer system.

Where wastewater flows have high salinity concentrations, the use of recycled water may be limited or require more expensive treatment. Landscape irrigation and industrial reuse become problematic at TDS concentrations of over 1,000 mg/L. Some crops are particularly sensitive to high TDS concentrations, and the use of high-salinity recycled water may reduce yields of these crops. In addition, concern for the water quality in groundwater basins may lead to restrictions on the use of recycled water on lands overlying those basins.

These issues are exacerbated during times of drought, when the salinity of imported water supplies increases because of increased salinity in wastewater flows and recycled water. Basin management plans and recycled water customers may restrict the use of recycled water at a time when its use would be most valuable. To maintain the cost-effectiveness of recycled water, therefore, the salinity level of the region's potable water sources and wastewater flows must be controlled.

In May 2009, the State Water Resources Control Board (SWRCB) adopted a Recycled Water Policy[3] to help streamline the permitting process and help establish uniform statewide criteria for recycled water projects. This policy promotes the development of watershed- or basin-wide salt management plans (to then be adopted by the respective Regional Boards) to meet water quality objectives and protect beneficial uses, rather than imposing project-by-project restrictions. The Recycled Water Policy identifies several criteria to guide recycled water irrigation or groundwater recharge project proponents in developing a salt (and nutrient) management plan.

Groundwater Basins

Increased TDS in groundwater basins occurs either when basins near the ocean are overdrafted, leading to seawater intrusion, or when agricultural and urban return flows add salts to the basins. Much of the water used for agricultural or urban irrigation infiltrates into the aquifer, so where irrigation water is high in TDS or where the water transports salts from overlying soil, the infiltrating water will increase the salinity of the aquifer. In addition, wastewater discharges in inland regions may lead to salt buildup from fertilizer and dairy waste. In the 1950s and 1960s, Colorado River water was used to recharge severely overdrafted aquifers and prevent saltwater intrusion. As a result, the region's groundwater basins received more than 3.0 MAF of this high-TDS imported water, significantly impacting salt loadings.

In the past, these high salt concentrations have caused some basins within Metropolitan's service area to be unsuitable for municipal uses if left untreated. The Arlington Basin in Riverside and the Mission Basin in San Diego required demineralization before they could be returned to municipal service. The capacity of the larger groundwater basins makes them better able to dilute the impact of increasing salinity. While most groundwater basins within the region still produce water of acceptable quality, this resource must be managed carefully to minimize further degradation. Even with today' s more heightened concern regarding salinity, approximately 600,000 tons of salts per year accumulate within the region, leading to ever-increasing salinity concentrations in many groundwater basins.

[3] http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/docs/recycledwaterpolicy_approved.pdf

Table 4-1 shows the salinity from existing productive groundwater wells within the region, and Figure 4-1 shows the distribution of those salinity concentrations. To protect the quality of these basins, regional water quality control boards often place restrictions on the salinity concentrations of water used for basin recharge or for irrigation of lands overlying the aquifers. Those situations may restrict water reuse and aquifer recharge, or they may require expensive mitigation measures.

Metropolitan has participated with water and wastewater agencies and the Santa Ana Regional Water Quality Control Board (Regional Board) in a coordinated program to develop water quality data for local and imported supplies used to recharge groundwater basins in the Santa Ana River watershed.[4] In January 2008, this workgroup submitted its "Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin" to the Santa Ana Regional Board. This initial agreement addresses nitrogen and TDS and includes the following tasks:

1. Prepare a projection of ambient water quality in each groundwater management zone at six-year intervals for the subsequent 20 years.
2. Determine the impacts of foreseeable recharge projects and compare to baseline ambient water quality with salinity objectives.
3. Compare current water quality in each groundwater management zone with the ambient water quality projection made six years earlier, together with an evaluation of the reason(s) for any differences.

The Salinity Management Policy

The Salinity Management Policy adopted by Metropolitan's Board specified a salinity objective of 500 mg/L for blended imported water. It also identified the need for both local and imported water sources to be managed comprehensively to maintain the ability to use recycled water and groundwater. To achieve these targets, SWP water supplies are blended with Colorado River supplies. Using this approach, the salinity target could be met in seven out of ten years. In the other three years, hydrologic conditions would result in increased salinity and reduced volume of SWP supplies. Metropolitan has alerted its local agencies that such conditions are inevitable, and that despite its best efforts, high salinity could be a concern at such times. Metropolitan has also urged its member agencies to structure the operation of their local projects and groundwater so they are prepared to mitigate the effect of higher salinity levels in imported waters. In addition, Metropolitan will concentrate on obtaining better quality water in the spring/summer months (April through September) to maximize the use of recycled water in agriculture.

Table 4-1
Salinity Levels at Productive Groundwater Wells

TDS Concentration (mg/L)	Annual Production (Million Acre-Feet)	Percent of Production
Less than 500	1.06	78
500 to 1,000	0.15	11
Greater than 1,000	0.15	11
Total	**1.36**	**100**

Source: Metropolitan Water District of Southern California, Salinity Management Study, Final Report, June 1999.

[4] http://www.swrcb.ca.gov/rwqcb8/board_decisions/adopted_orders/orders/2008/08_019.pdf

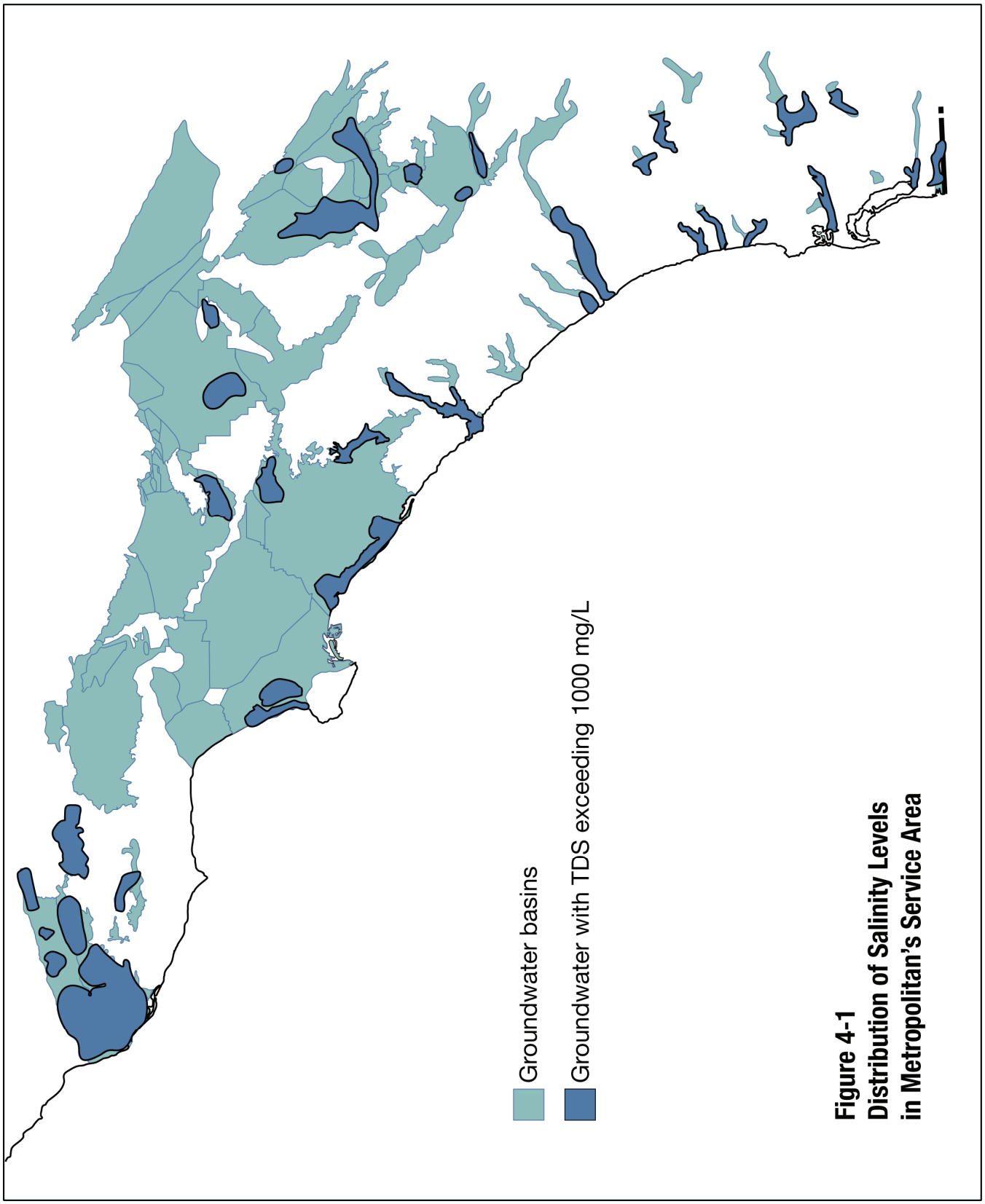

Figure 4-1
Distribution of Salinity Levels in Metropolitan's Service Area

Perchlorate

Perchlorate compounds are used as a main component in solid rocket propellant, and are also found in some types of munitions and fireworks. Perchlorate compounds quickly dissolve and become highly mobile in groundwater. Unlike many other groundwater contaminants, perchlorate neither readily interacts with the soil matrix nor degrades in the environment. Conventional drinking water treatment (as utilized at Metropolitan's water treatment plants) is not effective in removing perchlorate.

The primary human health concern related to perchlorate is its effects on the thyroid. Perchlorate interferes with the thyroid's ability to produce hormones required for normal growth and development. Pregnant women who are iodine deficient and their fetuses, infants and small children with low dietary iodide intake and individuals with hypothyroidism may be more sensitive to the effects of perchlorate.

The California Department of Public Health (CDPH) established a primary drinking water standard for perchlorate with an MCL of 6 micrograms per liter (μg/L)[5] effective October 18, 2007. There is currently no federal drinking water standard for perchlorate, but the USEPA is in the process of making its final regulatory determination for this contaminant. A regulatory determination would be the first step toward developing a national drinking water standard. Metropolitan has offered comments to USEPA during this regulatory process, focusing on the need to protect the Colorado River and to address cleanup of impacted water supplies as a result of federal institutions within its service area. In essence, Metropolitan urged for necessary actions to ensure expedited cleanup in areas that a California drinking water standard could not be enforced.

Perchlorate was first detected in Colorado River water in June 1997 and was traced back to Las Vegas Wash. The source of contamination was found to be emanating from a chemical manufacturing facility in Henderson, Nevada, now owned by Tronox, Inc. Tronox is currently responsible for the ongoing perchlorate remediation of the site. Another large perchlorate groundwater plume is also present in the Henderson area from a second industrial site, and although not known to have reached Las Vegas Wash yet, remediation activities are ongoing for cleanup of that plume by American Pacific Corporation (AMPAC).

Following the detection of perchlorate in the Colorado River, Metropolitan, along with USEPA and agencies in Nevada including the Nevada Division of Environmental Protection (NDEP), organized the forces necessary to successfully treat and decrease the sources of perchlorate loading. Under NDEP oversight, remediation efforts began in 1998 and treatment operations became fully operational in 2004. These efforts have reduced perchlorate loading into Las Vegas Wash from over 1000 lbs/day (prior to treatment) to 60-90 lbs/day since early 2007. This has resulted in over 90 percent reduction of the perchlorate loading entering the Colorado River system. In January 2009, Tronox filed for Chapter 11 bankruptcy protection citing significant environmental liabilities taken from the previous site owner. Tronox has continued operating its remediation system during the bankruptcy proceedings.

Perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from its peak of 9 μg/L in May 1998 as a result of the aggressive clean-up efforts. Levels have remained less than 6 μg/L since October 2002, and have been typically less than 2 μg/L since June 2006. Metropolitan routinely monitors perchlorate at 34 locations within its system and levels currently remain at non-detectable levels (below 2 μg/L). Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

[5] 1 microgram per liter is equivalent to 1 part per billion

Perchlorate has also been found in groundwater basins within Metropolitan's service area, largely from local sources. The vast majority of locations where perchlorate has been detected in the groundwater are associated with the manufacturing or testing of solid rocket fuels for the Department of Defense and the National Aeronautics and Space Administration (NASA), or with the manufacture, storage, handling, or disposal of perchlorate (such as Aerojet in Azusa in the Main San Gabriel Basin and the Jet Propulsion Laboratory/NASA in the Raymond Basin). Past agricultural practices using fertilizers laden with naturally occurring perchlorate have also been implicated in some areas.

Metropolitan has conducted several surveys to determine the impact of perchlorate on its member and retail agencies. As of October 2007, 18 member agencies have detected perchlorate in their service areas at levels greater than 4 μg/L, while 11 have detected levels greater than 6 μg/L in at least 101 out of 1337 wells (7.6 percent). Member and retail agencies have shut down 32 wells over the years due to perchlorate contamination, losing more than 52.5 TAF per year of their groundwater production. Many of these agencies have built new wells, blended their water, or installed ion exchange treatment systems to reduce perchlorate levels, thus lowering their potential additional demand for Metropolitan water supplies to about 15 TAF per year.

Metropolitan has investigated technologies to mitigate perchlorate contamination. Perchlorate cannot be removed using conventional water treatment. Nanofiltration and reverse osmosis do work effectively but at a very high cost. Aerojet has implemented biological treatment through fluidized bed reactors (FBR) in Rancho Cordova and is re-injecting the treated water into the ground. Tronox also utilizes an FBR process train for the cleanup of their Henderson site. A number of sites in Southern California have successfully installed ion exchange systems to treat perchlorate impacted groundwater. The city of Pasadena has been using ion exchange treatment at one well site and, in November 2009, completed a study of biological treatment for perchlorate removal in groundwater. Funding for this study was provided through a Congressional mandate from USEPA to Metropolitan.

Treatment options are available to recover groundwater supplies contaminated with perchlorate. However, it is very difficult to predict whether treatment will be pursued to recover all lost production because local agencies will make decisions based largely on cost considerations, ability to identify potentially responsible parties for cleanup, and the availability of alternative supplies.

Total Organic Carbon and Bromide

Disinfection byproducts (DBPs) form when source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or ozone. Studies have shown a link between certain cancers and DBP exposure. In addition, some studies have shown an association between reproductive and developmental effects and chlorinated water. While many DBPs have been identified and some are regulated under the Safe Drinking Water Act, there are others that are not yet known. Even for those that are known, the potential adverse health effects may not be fully characterized.

Water agencies began complying with new regulations to protect against the risk of DBP exposure in January 2002. This rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required water systems to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in January 2006 that makes regulatory compliance more challenging as compliance is based on a locational basis, rather than on a distribution system-wide basis.

Existing levels of TOC and bromide in Delta water supplies present significant concern for Metropolitan's ability to maintain safe drinking water supplies and comply with regulations. Levels of these constituents in SWP water

increase several fold due to agricultural drainage and seawater intrusion as water moves through the Delta. One of Metropolitan's primary objectives for the CALFED Bay-Delta process is protection and improvement of the water quality of its SWP supplies to ensure compliance with current and future drinking water regulations. Source water protection of SWP water supplies is a necessary component of meeting these requirements cost effectively.

The CALFED Record of Decision released in August 2000 adopted the following water quality goals for TOC and bromide:

- Average concentrations at Clifton Court Forebay and other southern and central Delta drinking water intakes of 50 µg/L bromide and 3.0 mg/L total organic carbon, or
- An equivalent level of public health protection using a cost-effective combination of alternative source waters, source control, and treatment technologies.

CALFED's Bay-Delta Program calls for a wide array of actions to improve Bay-Delta water quality, ranging from improvements in treatment technology to safeguarding water quality at the source. These actions include conveyance improvements, alternative sources of supply, changes in storage and operations, and advanced treatment by water supply agencies.

Source water quality improvements must be combined with cost-effective water treatment technologies to ensure safe drinking water at a reasonable cost. Metropolitan has five treatment plants: two that receive SWP water exclusively, and three that receive a blend of SWP and Colorado River water. In 2003 and 2005, Metropolitan completed upgrades to its SWP-exclusive water treatment plants, Mills and Jensen, respectively, to utilize ozone as its primary disinfectant. This ozonation process avoids the production of certain regulated disinfection byproducts that would otherwise form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water have met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limits the percentage of water from the SWP used in each plant. In mid 2010, Metropolitan anticipates ozone at the Skinner water treatment plant to come online. Metropolitan's Board has also adopted plans to install ozonation at its other two blend plants with a total estimated ozone retrofit program cost of $1.2 billion for all five plants.

Nutrients

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

SWP supplies have significantly higher nutrient levels than Colorado River supplies. Wastewater discharges, agricultural drainage, and nutrient-rich soils in the Delta are primary sources of nutrient loading to the SWP. Metropolitan and other drinking water agencies receiving Delta water have been engaged in efforts to minimize the effects of nutrient loading from Delta wastewater plants. Metropolitan reservoirs receiving SWP water have experienced numerous taste and

odor episodes in recent years. For example, in 2005, Metropolitan reservoirs experienced 12 taste and odor events requiring treatment. A taste and odor event can cause a reservoir to be bypassed and potentially have a short-term effect on the availability of that supply. Metropolitan has a comprehensive program to monitor and manage algae in its source water reservoirs. This program was developed to provide an early warning of algae related problems and taste and odor events to best manage water quality in the system.[6]

Although phosphorus levels are much lower in the Colorado River than the SWP, this nutrient is still of concern. Despite relatively low concentrations (Colorado River has been considered an oligotrophic, or low-productivity, system), any additions of phosphorus to Colorado River water can result in increased algal growth. In addition, low nutrient Colorado River water is relied upon by Metropolitan to blend down the high nutrient SWP water in Metropolitan's blend reservoirs. With population growth expected to continue in the future (e.g., Las Vegas area), ensuring high levels of treatment at wastewater treatment plants to maintain existing phosphorus levels will be critical in minimizing the operational, financial, and public health impacts associated with excessive algal growth and protect downstream drinking water uses. In addition, Metropolitan continues its involvement with entities along the lower Colorado River seeking to enhance wastewater management (and therefore better manage nutrient impacts) within river communities.

Although current nutrient loading is of concern for Metropolitan and is anticipated to have cost implications, with its comprehensive monitoring program and response actions to manage algal related issues, there should be no impact on availability of water supplies. Metropolitan's source water protection program will continue to focus on preventing increases in future nutrient loading as a result of urban and agricultural sources.

Arsenic

Arsenic is a naturally occurring element found in rocks, soil, water, and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water has been linked to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

The MCL for arsenic in domestic water supplies was lowered to 10 μg/L, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. The standard impacts both groundwater and surface water supplies. Historically, Metropolitan's water supplies have had low levels of this contaminant and would not require treatment changes or capital investment to comply with this new standard. However, some of Metropolitan's water supplies from groundwater storage programs are at levels near the MCL. These groundwater storage projects are called upon to supplement flow only during low SWP allocation years. Metropolitan has had to restrict flow from one program to limit arsenic increases in the SWP. Implementation of a pilot arsenic treatment facility by one groundwater banking partner has also resulted in increased cost. Moreover, Metropolitan has invested in solids handling facilities and implemented operational changes to manage arsenic in the solids resulting from the treatment process.

In April 2004, California's Office of Environmental Health Hazard Assessment (OEHHA) set a public health goal for arsenic

[6] William D. Taylor et al., *Early Warning and Management of Surface Water Taste-and-Odor Events*, Project No. 2614 (Denver, CO: American Water Works Association Research Foundation, 2006)

of 0.004 µg/L, based on lung and urinary bladder cancer risk. Monitoring results submitted to CDPH in 2001-2003 showed that arsenic is ubiquitous in drinking water sources, reflecting its natural occurrence. They also showed that many sources have arsenic detections above the 10 µg/L MCL. Southern California drinking water sources that contain concentrations of arsenic over 10 µg/L include San Bernardino (64 sources), Los Angeles (48 sources), Riverside (26 sources), Orange (4 sources), and San Diego (5 sources).[7]

The state detection level for purposes of reporting (DLR) of arsenic is 2 µg/L. Between 2001 and 2008, arsenic levels in Metropolitan's water treatment plant effluents ranged from not detected (< 2 µg/L) to 2.9 µg/L. For Metropolitan's source waters, levels in Colorado River water have ranged from not detected to 3.5 µg/L, while levels in SWP water have ranged from not detected to 4.0 µg/L. Increasing coagulant doses at water treatment plants can reduce arsenic levels for delivered water.

Some member agencies may face greater problems with arsenic compliance. A 1992 study for Central Basin Municipal Water District, for example, indicated that some of the Central Basin wells could have difficulty in complying with a lowered standard.[8] Water supplies imported by the Los Angeles Department of Water and Power may also contain arsenic above the MCL. The cost of arsenic removal from these supplies could vary significantly.

Uranium

A 16-million-ton pile of uranium mill tailings near Moab, Utah lies approximately 750 feet from the Colorado River. Due to the proximity of the pile to the Colorado River, there is a potential for the tailings to enter the river as a result of a catastrophic flood event or other natural disaster. In addition, contaminated groundwater from the site is slowly seeping into the river. The U.S. Department of Energy (DOE) is responsible for remediating the site, which includes removal and offsite disposal of the tailings and onsite groundwater remediation.

Previous investigations have shown uranium concentrations contained within the pile at levels significantly above the California MCL of 20 picocuries per liter (pCi/L). Metropolitan has been monitoring for uranium in the Colorado River Aqueduct and at its treatment plants since 1986. Monitoring at Lake Powell began in 1998. Uranium levels measured at Metropolitan's intake have ranged from 1-6 pCi/L, well below the California MCL. Conventional drinking water treatment, as employed at Metropolitan's water treatment plants, can remove low levels of uranium, however these processes would not be protective if a catastrophic event washed large volumes of tailings into the Colorado River. Public perception of drinking water safety is also of particular concern concerning uranium.

Remedial actions at the site since 1999 have focused on removing contaminated water from the pile and groundwater. Through 2009, over 2,700 pounds of uranium in contaminated groundwater have been removed. In July 2005, DOE issued its Final Environmental Impact Statement with the preferred alternative of permanent offsite disposal by rail to a disposal cell at Crescent Junction, Utah, located approximately 30 miles northwest of the Moab site.

Rail shipment and disposal of the uranium mill tailings pile from the Moab, Utah site began in April 2009. Through March 2010, DOE has shipped over 1 million tons of mill tailings to the Crescent Junction disposal cell. Using American Recovery and Reinvestment Act (ARRA) 2009 funding, DOE has increased shipments in order to meet its ARRA project

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[7] From the CDPH web site: http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Arsenic.aspx . Note that the numbers reported there may change because the website is frequently updated.

[8] *Summary Review on the Occurrence of Arsenic in the Central Groundwater Basin, Los Angeles County, California*, prepared by Richard C. Slade & Associates, Sept. 7, 1993.

commitment to ship an additional 2 million tons of mill tailings by September 2011 and accelerate overall clean-up of the site. DOE estimates completing movement of the tailings pile by 2025, with a goal of 2019 should additional funding be secured. Metropolitan continues to track progress of the remediation efforts, provide the necessary legislative support for rapid cleanup, and work with Congressional representatives to support increased annual appropriations for this effort.

Another uranium-related issue began receiving attention in 2008 due to a renewed worldwide interest in nuclear energy and the resulting increase in uranium mining claims filed throughout the western United States. Of particular interest were thousands of mining claims filed near Grand Canyon National Park and the Colorado River. Metropolitan has since sent letters to the Secretary of Interior to highlight source water protection and consumer confidence concerns related to uranium exploration and mining activities near the Colorado River, and advocate for close federal oversight over these activities. In 2009, Secretary of Interior Ken Salazar announced the two-year hold on new mining claims on 1 million acres adjacent to the Grand Canyon to allow necessary scientific studies and environmental analyses to be conducted. In 2009, H.R. 644 – Grand Canyon Watersheds Protection Act was introduced and if enacted, would permanently withdraw areas around the Grand Canyon from new mining activities.

Chromium VI

Chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium III is typically the form found in soils and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium VI is used in electroplating, stainless steel production, leather tanning, textile manufacturing, dyes and pigments, wood preservation and as an anti-corrosion agent. Chromium occurs naturally in deep aquifers and can also enter drinking water through discharges of dye and paint pigments, wood preservatives, chrome plating liquid wastes, and leaching from hazardous waste sites. In drinking water, Chromium VI is very stable and soluble in water, whereas chromium III is not very soluble. Chromium VI is the more toxic species and is known to cause lung cancer in humans when inhaled, but the health effects in humans from ingestion are still in question. There is evidence that when Chromium VI enters the stomach, gastric acids may reduce it to chromium III. However, recent studies conducted by the National Toxicology Program have shown that Chromium VI can cause cancer in animals when administered orally.

Currently, there are no drinking water standards for Chromium VI. Total chromium (including chromium III and Chromium VI) is regulated in California with an MCL of 50 μg/L. On August 20, 2009, OEHHA released a draft public health goal (PHG) of 0.06 μg/L for Chromium VI in drinking water. The PHG is a health-protective, non-regulatory level that will be used by CDPH in its development of an MCL. CDPH will set the MCL as close to the PHG as technically and economically feasible.

Metropolitan utilizes an analytical method with a minimum reporting level of 0.03 μg/L, which is less than the State detection level for purposes of reporting (DLR) of 1 μg/L. The results from all of Metropolitan's source and treated waters are less than the State DLR of 1 μg/L (except for one detection of 1 μg/L at the influent to the Mills water treatment plant). The following summarizes Chromium VI levels found in Metropolitan's system:

- In the past 10 years, results of source and treated water monitoring for Chromium VI indicate: Levels in Colorado River water are mostly not detected (<0.03 μg/L) but when detected range from 0.03 – 0.08 μg/L. SWP levels range from 0.03 – 0.8 μg/L. Treated water levels range from 0.03 – 0.7 μg/L.

- There is a slight increase in Chromium VI in the treated water from the oxidation (chlorination and ozonation) of natural background chromium (total) to Chromium VI.
- Colorado River monitoring results upstream and downstream of the Topock site (discussed below) have ranged from not detected (<0.03 μg/L) to 0.06 μg/L.
- Chromium VI in Metropolitan's groundwater pump-in storage programs in the Central Valley has ranged from not detected (< 1 μg/L) to 9.1 μg/L with the average for the different programs from 1.4 to 5.0 μg/L.
- Chromium VI has been detected in a groundwater aquifer on the site of a Pacific Gas and Electric (PG&E) gas compressor station located along the Colorado River near Topock, Arizona.

PG&E used Chromium VI as an anti-corrosion agent in its cooling towers from 1951 to 1985. Wastewater from the cooling towers was discharged from 1951 to 1968 into a dry wash next to the station. Monitoring wells show the plume concentration has peaked as high as 16,000 μg/L. PG&E operates an interim groundwater extraction and treatment system that is protecting the Colorado River. Quarterly monitoring of the river has shown levels of Chromium VI less than 1 μg/L, which are considered background levels. The California Department of Toxic Substances Control and the U. S. Department of Interior are the lead state and federal agencies overseeing the cleanup efforts. Metropolitan participates through various stakeholder workgroups and partnerships that include state and federal regulators, Indian tribes, and other stakeholders (e.g., Colorado River Board) involved in the corrective action process. In 2010, it is anticipated that a final treatment alternative will be selected, and an Environmental Impact Report will be released for the recommended cleanup alternative.

The federal- and state-approved technologies for removing total chromium from drinking water include coagulation/ filtration, ion exchange, reverse osmosis, and lime softening. Potential treatment technologies for Chromium VI in drinking water may include reduction/chemical precipitation, an ion exchange, or reverse osmosis. For several years, the cities of Glendale, Burbank, and Los Angeles have been voluntarily limiting Chromium VI levels in their drinking water to 5 μg/L, an order of magnitude lower than the current statewide total chromium standard of 50 μg/L. The experience of these agencies in the treatment of water containing Chromium VI will be helpful in CDPH's evaluations of treatment technologies and associated costs, which are required as part of a proposed MCL regulation package.

N-Nitrosodimethylamine

N-Nitrosodimethylamine (NDMA) is part of a family of organic chemicals called nitrosamines and is a byproduct of the disinfection of some natural waters with chloramines. Metropolitan utilizes chloramines as a secondary disinfectant at its treatment plants. Wastewater treatment plant effluent and agricultural runoff can contribute organic material into source waters which react to form NDMA at water treatment plants. Certain polymers can also contribute NDMA precursor materials. Some NDMA control measures or removal technologies may be required to avoid adverse impacts on Southern California drinking water supplies. Metropolitan is involved in several projects to understand the watershed sources and occurrence of NDMA precursors in Metropolitan source waters, and to develop treatment strategies to minimize NDMA formation in drinking water treatment plants and distribution systems. Special studies conducted at Metropolitan have shown removal of NDMA using advanced oxidation processes. Other treatment process such as biological, membrane, and carbon adsorption need to be evaluated for NDMA removal.

USEPA considers NDMA to be a probable human carcinogen. USEPA placed NDMA in the Unregulated Contaminant Monitoring

Regulation 2 (UCMR2) and on the Contaminant Candidate List 3 (CCL3). CDPH also considers NDMA to be a probable human carcinogen. CDPH has not established a MCL for NDMA. However, in 1998 CDPH established a notification level of 0.01 µg/L. Occurrences of NDMA in treated water supplies at concentrations greater than 0.01 µg/L are recommended to be included in the utility's annual Consumer Confidence Report. In December 2006, OEHHA set a public health goal for NDMA of 0.003 µg/L. Metropolitan has monitored its source waters (at treatment plant influents) and treated waters on a quarterly basis since 1999. Test results for the presence of NDMA in Metropolitan's system have ranged from non-detect (reporting limit of 0.002 µg/L) to 0.014 µg/L. Preliminary data from UCMR2 confirm that the presence of NDMA is not limited to Metropolitan waters, but is widespread. NDMA, or a broader class of nitrosamines, may likely be the next disinfection byproduct(s) to be regulated by USEPA.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are a growing concern to the water industry. Numerous studies have reported the occurrence of these emerging contaminants in treated wastewater, surface water, and sometimes, in finished drinking water in the United States and around the world. The sources of PPCPs in the aquatic environment include (but may not be limited to) treated wastewater and industrial discharge, agricultural run-off, and leaching of municipal landfills. Currently, there is no evidence of human health risks from long-term exposure to the low concentrations (low ng/L; parts per trillion) of PPCPs found in some drinking water. Furthermore, there are no regulatory requirements for PPCPs in drinking water. In October 2009, USEPA included 13 PPCPs on the CCL3; however, currently there are no standardized analytical methods for these compounds.

In 2007, Metropolitan implemented a monitoring program to determine the occurrence of PPCPs and other organic wastewater contaminants in Metropolitan's treatment plant effluents and selected source water locations within the Colorado River and SWP watersheds. Some PPCPs have been detected at very low ng/L levels, which is consistent with reports from other utilities. However, analytical methods are still being refined and more work is required to fully understand occurrence issues. Metropolitan has been actively involved in various studies related to PPCPs, including analytical methods improvements, and characterization of drinking water sources in California.

Metropolitan has participated with water and wastewater agencies and the Santa Ana Regional Board in a coordinated program to address emerging constituents relevant to local and imported supplies used to recharge groundwater basins in the Santa Ana River watershed. As part of the Regional Board-adopted "Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin", there are provisions for the workgroup to initiate development of monitoring for emerging unregulated constituents. Metropolitan, Orange County Water District, and the National Water Research Institute provided substantial input to the workgroup through its two-year monitoring study of emerging constituents in waters found throughout watersheds of the SWP, Colorado River, and Santa Ana River. In April 2009, the workgroup completed its Phase I Report summarizing its findings and recommendations regarding investigation into emerging constituents in water supplies. In December 2009, the workgroup submitted its proposed 2010/11 plan for monitoring of emerging constituents in imported and local waters. The workgroup also provided input to a Blue Ribbon Panel convened by the State Water Resources Control Board to review the emerging science of unregulated chemicals as it relates to the use of recycled water for irrigation and groundwater recharge.

Decreasing Concerns

Methyl Tertiary-Butyl Ether

Methyl tertiary-butyl ether (MTBE) was the primary oxygenate in virtually all the gasoline used in California, prior to the discovery that MTBE had contaminated groundwater supplies and was also found in surface water supplies. MTBE was banned in California as of December 31, 2003, although the concentration of MTBE in gasoline blends was voluntarily reduced beginning in January 2003. MTBE has subsequently been replaced by ethanol which is now the primary oxygenate in use. CDPH has adopted a primary MCL of 13 μg/L for MTBE based on carcinogenicity studies in animals. MTBE also has a California secondary MCL of 5 μg/L, which was established based on taste and odor concerns.

MTBE was introduced into surface water bodies from the motor exhausts of recreational watercraft. At Diamond Valley Lake and Lake Skinner, Metropolitan has taken steps to reduce the potential for MTBE contamination. In 2003, Metropolitan's Board authorized a non-polluting boating program for these reservoirs that calls for specific boat requirements (MTBE-free fuel and clean burning engines) and a monitoring program that will show if MTBE or other gasoline contaminants appear at the lake. Metropolitan regularly monitors its water supply for contamination from MTBE and other oxygenates. In recent years, MTBE testing results in source waters have remained at non-detectable levels (below 3 μg/L).

MTBE still presents a significant problem to local groundwater basins. Leaking underground storage tanks and poor fuel-handling practices in the past at local gas stations may provide a large source of MTBE. MTBE is very soluble in water and has low affinity for soil particles, so it moves quickly into the groundwater. Within Metropolitan's service area, local groundwater producers have been forced to close some of their wells due to MTBE contamination. MTBE is also resistant to chemical and microbial degradation in water, making treatment more difficult than the treatment of other gasoline components. A combination of an advanced oxidation process (typically ozone and hydrogen peroxide) followed by granular activated carbon has been found to be effective in reducing the levels of these contaminants.

Although some groundwater supplies remain contaminated with this highly soluble chemical, contamination of Metropolitan's surface water supplies are no longer a problem. Further, improved underground storage tank requirements and monitoring, and the phase-out of MTBE as a fuel additive, will decrease the likelihood of MTBE groundwater problems in the future.

Other Water Quality Programs

In addition to monitoring for and controlling specific identified chemicals in the water supply, Metropolitan has undertaken a number of programs to protect the quality of its water supplies. These programs are summarized below.

Source Water Protection

Source water protection is the first step in a multi-barrier approach to provide safe and reliable drinking water. In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, CDPH requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities that will protect and improve source water quality. The most recent sanitary surveys for Metropolitan's water sources were completed in 2005 and 2006.[9] The next Sanitary Surveys for the watersheds of the

9 Metropolitan Water District of Southern California, *Colorado River Watershed Sanitary Survey, 2005 Update*. For the State Water Project, the sanitary survey report was prepared on behalf of the State Water Project Contractors Authority, in 2006, and was titled *California State Water Project Watershed Sanitary Survey, 2006 Update*.

Colorado River and the SWP will report on water quality issues and monitoring data through 2010. Metropolitan has an active source water protection program and continues to advocate on behalf of numerous SWP and Colorado River water quality protection issues.

Support SWP Water Quality Programs

Metropolitan supports DWR policies and programs aimed at maintaining or improving the quality of SWP water delivered to Metropolitan. In particular, Metropolitan supported the DWR policy to govern the quality of non-project water conveyed by the California Aqueduct. In addition, Metropolitan has supported the expansion of DWR's Municipal Water Quality Investigations Program beyond its Bay-Delta core water quality monitoring and studies to include enhanced water quality monitoring and forecasting of the Delta and SWP. These programs are designed to provide early warning of water quality changes that will affect treatment plant operations both in the short-term (hours to weeks) and up to seasonally. The forecasting model is currently suitable for use in a planning mode. It is expected that with experience and model refinement, it will be suitable to use as a tool in operational decision making.

Water Quality Exchanges

Metropolitan has implemented selective withdrawals from the Arvin-Edison storage program and exchanges with the Kern Water Bank to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may be withdrawn at times of lower water quality, thus diluting SWP water deliveries. Although elevated arsenic levels has been a particular concern in one groundwater banking program, there are also short-term water quality benefits that can be realized through other storage programs, such as groundwater pump-ins into the California Aqueduct with lower TOC levels (as well as lower bromide and TDS, in some programs).

Water Supply Security

The change in the national and international security situation has led to increased concerns about protecting the nation's water supply. In coordination with its member agencies, Metropolitan added new security measures in 2001 and continues to upgrade and refine procedures. Changes have included an increase in the number of water quality tests conducted each year (Metropolitan now conducts over 300,000 analytical tests on samples collected within our service area and source waters), as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.

Appendix H: CUWCC Reports

City of Beverly Hills 2010 Urban Water Management Plan

Reported as of 9/30/10

Water Supply & Reuse

Reporting Unit: **City of Beverly Hills**

Year: **2008**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Metropolitan Water District	25280	Imported
City of Beverly Hills	2600	Groundwater

Total AF: 27880

Reported as of 9/30/10

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
City of Beverly Hills	**10/21/2009**	**2008**

A. Service Area Population Information:

1. Total service area population 44049

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	7003	7260	0	0
2. Multi-Family	1900	2692	0	0
3. Commercial	1231	2280	0	0
4. Industrial	78	64	0	0
5. Institutional	191	473	0	0
6. Dedicated Irrigation	36	72	0	0
7. Recycled Water	0	0	0	0
8. Other	0	0	0	0
9. Unaccounted	NA	0	NA	0
Total	10439	12841	0	0

	Metered	Unmetered

Reported as of 9/30/10

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Implementation

1. Based on your signed MOU date, 09/08/2004, your Agency STRATEGY DUE DATE is:	09/08/2006
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1992
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1992

B. Water Survey Data

Survey Counts:	**Single Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	no	no
a. If yes, in what form are surveys tracked?		

b. Describe how your agency tracks this information.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

BMP 02: Residential Plumbing Retrofit

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2008

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

a. If YES, list local jurisdictions in your service area and code or ordinance in each:

Beverly Hills

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 40%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 50%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no

a. If YES, when did your agency begin implementing this strategy?

b. Describe your targeting/ marketing strategy.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	2640	688
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? no

a. If YES, in what format are low-flow devices tracked?

b. If yes, describe your tracking and distribution system :

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Due to the exisitng building code since 2000, the number of substantial remodels and new construction has led to the City of Beverly Hill's estimates.

Reported as of 9/30/10

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2008

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	yes
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	12518
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	14022
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.89
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	no
7. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

We have 40 PermaLog leak detection modules. These are placed on water valves in the distribution system. When they are placed in the valve well on the valve and activated they will listen for leaks at approximately 2:00 A. M. and if they detect a leak they will listen again an hour later. The information is stored on its memory and retrieved with a lap top computer later. This could be retrieved once a week. The 40 PermaLogs are placed in an area or quadrant of the distribution system and will cover a large area. If no leak is detected over a period of one to two weeks the modules will be pulled and placed in another area. If a leak is discovered it will be scheduled for repair and the units left in place for another one to two weeks to see if any other leaks are detected before they are moved. In the City*s new water meter change out program the new Neptune Water Meters are smart meters that can detect a leak. The new water meters use a fixed network system. This means the water meter sends the water meter reading four times per day to a DATA COLLECTION UNIT. Then the DATA COLLECTION UNIT calls into the network computer each morning around 2:00 A.M. These meters will determine if there is a leak on the customers property. If there is a continuous usage of water over a 24 hour period the system will send out an alarm noting the address so the City*s Customer Service Representative can notify the customer that they have a leak on their property.

B. Survey Data

1. Total number of miles of distribution system line.	170.8
2. Number of miles of distribution system line surveyed.	170.8

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

We began installing the new "smart" meters in 2008 that provide data if a customers meter is registering water consumption through the meter more than 55 15-minute intervals in a 24 hour period than it is assumed a leak is on property.

D. Comments

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:	1504.8	1504.8
2. Volume treated water supplied into the system:	13783	13783
3. Volume of water exported from the system:	0	0
4. Volume of billed authorized metered consumption:	12441	12441
5. Volume of billed authorized unmetered consumption:		
6. Volume of unbilled authorized metered consumption:		
7. Volume of unbilled authorized unmetered consumption:		

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:		System Facility
2. How frequently are they tested and calibrated?		12
3. Length of mains:	170.8	170.8
4. What % of distribution mains are rigid pipes (metal, ac, concrete)?	100	
5. Number of service connections:	10669	10669
6. What % of service connections are rigid pipes (metal)?	100	100
7. Are residential properties fully metered?		yes
8. Are non-residential properties fully metered?		yes
9. Provide an estimate of customer meter under-registration:	0	0
10. Average length of customer service line from the main to the point of the meter:		
11. Average system pressure:		95
12. Range of system pressures:		From 52 to 108
13. What percentage of the system is fed from gravity feed?		98
14. What percentage of the system is fed by pumping and re-pumping?		2

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?	Utility
2. Does your agency test, repair and replace your meters on a regular timed schedule?	yes
a. If yes, does your agency test by meter size or customer category?:	Meter Size

b. If yes to meter size, please provide the frequency of testing by meter size:

Less than or equal to 1"	8 years
1.5" to 2"	8 years
3" and Larger	6 months

c. If yes to customer category, provide the frequency of testing by customer category:

SF residential	
MF residential	
Commercial	
Industrial & Institutional	

3. Who is responsible for repairs to the customer lateral or customer service line?	Utility
4. Who is responsible for service line repairs downstream of the customer meter?	Utility
5. Does your agency proactively search for leaks using leak survey techniques or does your utility reactively repair leaks which are called in, or both?	both

6. What is the utility budget breakdown for:

Leak Detection	$ 110,000
Leak Repair	$ 92,000
Auditing and Water Loss Evaluation	$ 25,000
Meter Testing	$ 125,000

H. Comments

Reported as of 9/30/10

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2008

A. Implementation

1. Does your agency have any unmetered service connections? No

    a. If YES, has your agency completed a meter retrofit plan?

    b. If YES, number of previously unmetered accounts fitted with meters during report year:

2. Are all new service connections being metered and billed by volume of use? Yes

3. Are all new service connections being billed volumetrically with meters? Yes

4. Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? No

5. Please fill out the following matrix:

Account Type	Number of Metered Accounts	Number of Metered Accounts Read	Number of Metered Accounts Billed by Volume	Billing Frequency Per Year	Number of Volume Estimates
a. Single Family	7003	7003	7003	6	6656
b. Multi-Family	1900	1900	1900	6	2800
c. Commercial	1231	1231	1231	6	2000
d. Industrial	78	78	78	6	69
e. Institutional	191	191	191	6	0
f. Landscape Irrigation	36	36	36	6	70

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no

    a. If YES, when was the feasibility study conducted? (mm/dd/yy)

    b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters: 0

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	32
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	0
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	no

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	no
a. If YES, when did your agency begin implementing this strategy?	
b. Description of marketing / targeting strategy:	
2. Number of Surveys Offered during reporting year.	0
3. Number of Surveys Completed during reporting year.	0
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	no
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	no
d. Measure Landscape Area	no
e. Measure Total Irrigable Area	no
f. Provide Customer Report / Information	no
5. Do you track survey offers and results?	no
6. Does your agency provide follow-up surveys for previously completed surveys?	no
a. If YES, describe below:	

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.
Does your agency provide mixed-use accounts with landscape budgets? no

2. Number of CII mixed-use accounts with landscape budgets. 0

Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. (From BMP 4 report) 0

Total number of change-outs from mixed-use to dedicated irrigation meters since Base Year.

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

The City provides information on WBIC and rebates relating to such at various events and outreach opportunities. Information is included in flyers available at the Planning Dept. counter, on the City website, and ads.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? no

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

City disseminates low-flow irrigation information at key community events such as the Flower and Garden Show and Earth Day and through its website.

E. Comments

The majority of marketing for CII comes from the Save A Buck program through Metropolitan Water District. Part of the City's role is to inform program representative one what areas they would like to target. (i.e., hotels, restaurants etc. and what devices). Together they outreach to those customers on what devices are available for rebates.

Reported as of 9/30/10

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Coverage Goal

	Single Family	Multi-Family
1. Number of **residential** dwelling units in the agency service area.	6,666	1,426
2. Coverage Goal =	= **466 Points**	

B. Implementation

1. Does your agency offer rebates for **residential** high-efficiency washers? yes

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
2. **Greater than 8.5 but not exceeding 9.5** (1 point)	32	$ 0	$ 3,300	$ 0	$ 3,300	32
3. **Greater than 6.0 but not exceeding 8.5** (2 points)	0	$ 0	$ 0	$ 0	$ 0	0
4. **Less than or equal to 6.0** (3 points)	0	$ 0	$ 0	$ 0	$ 0	0
TOTALS:	**32**	**$ 0**	**$ 3,300**	**$ 0**	**$ 3,300**	**32**

C. Past Credit Points

For HEW incentives issued before July 1, 2004, select ONE of the following TWO options:

- Method One: Points based on HEW Water Factor
- Method Two: Agency earns 1 point for each HEW.

PAST CREDIT TOTALS:	**0**	**$ 0**	**0**

D. Rebate Program Expenditures

1. Average or Estimated Administration and Overhead $ 1,000
2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW? no

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 9/30/10

BMP 07: Public Information Programs

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2008

A. Implementation

1. How is your public information program implemented?
   Wholesaler and retailer both materially participate in program
   Which wholesaler(s)?
   Metropolitan Water District of Southern California and City of Beverly Hills

2. Describe the program and how it's organized:
   Many of the publc outreach programs are inconjuction with MWD. For instance although the rebates we offer are through MWD, the city uses a portion of MWD brochures to promote, the city also uses its own design and created additional materials to further promote so that Beverly Hills residents are clear that this a program we are a part of and support.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	yes	8
b. Public Service Announcement	yes	6
c. Bill Inserts / Newsletters / Brochures	yes	6
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	2
g. Speaker's Bureau	yes	1
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing) 9000

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City of Beverly Hills takes an active role in promoting water conservation in conjuction with what MWD offers. We provide water conservation materials, suggestions on how to save, pamplets to the children to bring to the parents, rulers to display droplet and water usaged from a drop of water, toilet tabs to indentify leaking toilets, reminders on pencils, cable information and website information.

D. Comments

The city's outreach program expands upon activities offered through Metropolitan Water District. The city puts ads in the local paper promoting water conservation using our taglines, providing outreach to students with the bookcovers with water saving images & information, shower sand timers and other in-house graphics for materials promoting water efficiency. Approximately $2,400 in ads and promotion was spent aside from Metropolitan Water District materials for purchasing water conservation items to help educate the public. In addition to MWD programming: Paid advertising = 6, Public Annoucements = 4, Bill Inserts etc = 5,Demonstration Garden = 1, Special Events/Media = 2

Reported as of 9/30/10

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Implementation

1. How is your public information program implemented?
   Wholesaler implements program (none or minimal retailer participation)

Which wholesaler(s)?
   Metropolitan Water District of Southern California

Public Information Program Activity Reported By Wholesaler

Reported as of 9/30/10

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period:	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	# Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0

j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? yes

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? no

7. **System Calculated** annual savings (AF/yr):

CII Programs	Avg Savings (AF/yr)	# Device Installations	Annual Savings/ Program (AF/yr)
a. Ultra Low Flush Toilets	.035004	3	.105012
b. Dual Flush Toilets	.041748	0	0
c. High Efficiency Toilets	.041748	0	0
d. High-Efficiency Urinals	.069086	0	0
e. Non-Water Urinals	.0921146	10	.921146
f. Commercial Clothes Washers (only coin-op; not industrial)	.116618	11	1.282798
g. Cooling Tower Conductivity Controllers	1.03225	2	2.0645
h. Food Steamers	.25	0	0
i. Ice Machines	.834507	0	0
j. Pre-Rinse Spray Valves	.084701	0	0
k. Steam Sterilizer Retrofits	1.538	0	0
l. X-ray Film Processors	2.57	0	0
		Total System Calculated Savings:	4.373456

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency*:	0 (x 25%)

*Note: Agencies may credit **100%** of estimated annual savings of interventions that have been site verified and **25%** of estimated annual savings of interventions that have not been site verified. (BMP 9 E.4.c.)

TOTAL CII Program Performance Target Savings: 4.373456

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	2000	1000
2. Actual Expenditures	2000	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

We provide outreach to CII customers at various events; target customers regarding specific devices that would be of use resulting in water savings.

D. Comments

City partners with MWD for CII accounts

Reported as of 9/30/10

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Implementation

Water Service Rate Structure Data by Customer Class

1. Single Family Residential

a. Rate Structure	Increasing Block
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 12,318,733
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$,

2. Multi-Family Residential

a. Rate Structure	Increasing Block
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 4,304,059
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

3. Commercial

a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 3,819,467
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

4. Industrial

a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 131,829
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

5. Institutional / Government

a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 560,685
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

6. Dedicated Irrigation (potable)

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 130,630
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

7. Recycled-Reclaimed

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

8. Raw

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

9. Other

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

B. Implementation Options

Select Either Option 1 or Option 2:

1. Option 1: Use Annual Revenue As Reported

V/(V+M) >= 70% — Selected

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges

2. Option 2: Use Canadian Water & Wastewater Association Rate Design Model

V/(V+M) >= V'/(V'+M')

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges
V' = The uniform volume rate based on the signatory's long-run incremental cost of service
M' = The associated meter charge

a. If you selected Option 2, has your agency submitted to the Council a completed Canadian Water & Wastewater Association rate design model?

b. Value for **V'** (uniform volume rate based on agency's long-run incremental cost of service) as determined by the Canadian Water & Wastewater Association rate design model:

c. Value for **M'** (meter charge associated with V' uniform volume rate) as determined by the Canadian Water & Wastewater Association rate design model:

C. Retail Wastewater (Sewer) Rate Structure Data by Customer Class

1. Does your agency provide sewer service? (If YES, answer questions 2 - 7 below, else continue to section D.) — yes

2. Single Family Residential

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 1,317,124
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 1,317,124

3. Multi-Family Residential

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 2,322,938
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 2,322,938

4. Commercial

a. Sewer Rate Structure	Uniform
b. Total Annual Revenue	$ 4,193,394
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 4,193,394

5. Industrial

a. Sewer Rate Structure	Uniform
b. Total Annual Revenue	$ 109,408
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 109,408

6. Institutional / Government

a. Sewer Rate Structure	Uniform
b. Total Annual Revenue	$ 359,175
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 359,175

7. Recycled-reclaimed water

a. Sewer Rate Structure	Service Not Provided
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."
The City owns and operates the wastewater collection system that collects wastewater and discharges it to the L.A. City-owned Hyperion Treatment Plant. The City charges in accordance with the cost of service principles. Residents are assessed a fixed rate while non-residental customers are assessed a fixed charge; quantity charge; and a strength surcharge.

E. Comments

The City only tracks revenues t an aggregate level and is, therefore, unable to determine volumetric revenues by class type.

Reported as of 9/30/10

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2008**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	yes
a. Partner agency's name:	Metropolitan Water District
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	25%
b. Coordinator's Name	Arnetta Eason
c. Coordinator's Title	Management Analyst
d. Coordinator's Experience in Number of Years	3 years
e. Date Coordinator's position was created (mm/dd/yyyy)	010/01/2005
4. Number of conservation staff (FTEs), including Conservation Coordinator.	.3

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	26000
2. BMP Program Implementation Expenditures	22000

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City does not have a full-time dedicated water conservation coordinator (most work being accomplished by a Management Analyst). It maintains its water conservation program and implements the Demand Management Measures through its staff, operators, inspectors and in collaboration with MWD.

D. Comments

Reported as of 9/30/10

BMP 13: Water Waste Prohibition

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2008

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Water Conservation Ordinance No.92-02139 prohibits water waste and calls for five stages (A through E) of increasingly restrictive consumption during drought times. Stage A calls for a 5% voluntary compliance while Stage E would be enacted during times of catastrophic interruptions and imposes misdemeanor charges. Stage A was declared in 2008.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of West Hollywood	WHMC 15.52

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding no

b. Single-pass cooling systems for new connections no

c. Non-recirculating systems in all new conveyor or car wash systems yes

d. Non-recirculating systems in all new commercial laundry systems no

e. Non-recirculating systems in all new decorative fountains no

f. Other, please name no

2. Describe measures that prohibit water uses listed above:

Certain prohibited actions are enacted in Stage B with mandatory compliance restricting use by 10%

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2008

A. Implementation

Number of Non-Efficient Toilets Replaced With 1.6 gpf Toilets During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	61	42
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**61**	**42**

Number of Non-Efficient Toilets Replaced With 1.28 gpf High-Efficiency Toilets (HETs) During Report Year

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate	39	1
8. Direct Install	0	0
9. CBO Distribution	0	0
10. Other	0	0
Total	**39**	**1**

Number of Non-Efficient Toilets Replaced With 1.2 gpf HETs (Dual-Flush) During Report Year

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	7	2
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0

Total	**7**	**2**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for single-family residences.

Residents submit rebate applications which they can find on the City's website. These are then reviewed for eligibility. If applications aren't approved, thank you letters are sent out otherwise rebates are issued.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

Residents submit rebate applications which they can find on the City's website. These are then reviewed for eligibility. If applications aren't approved, thank you letters are sent out otherwise rebates are issued.

18. Is a toilet retrofit on resale ordinance in effect for your service area? yes

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Ordinance is in the process of completion and adoption. It will apply to all customers (residential, multi, and commercial) which are serviced by the City's Utilities Division.	Ordinance will be submitted to CUWCC upon adoption.

B. Residential ULFT Program Expenditures

1. Estimated cost per replacement: $ 0

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

Water Supply & Reuse

Reporting Unit: **City of Beverly Hills**

Year: **2007**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Metropolitan Water District	24955	Imported
City of Beverly Hills	2505	Groundwater

Total AF: 27460

Reported as of 9/30/10

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
City of Beverly Hills	**10/21/2009**	**2007**

A. Service Area Population Information:

1. Total service area population 44021

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	6666	7081	0	0
2. Multi-Family	1900	2578	0	0
3. Commercial	1231	2203	0	0
4. Industrial	104	63	0	0
5. Institutional	156	465	0	0
6. Dedicated Irrigation	34	70	0	0
7. Recycled Water	0	0	0	0
8. Other	0	0	0	0
9. Unaccounted	NA	1304	NA	0
Total	10091	13764	0	0

Metered	Unmetered

Reported as of 9/30/10

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. Based on your signed MOU date, 09/08/2004, your Agency STRATEGY DUE DATE is:	09/08/2006
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	01/01/1992
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	1/1/1992

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	no	no
a. If yes, in what form are surveys tracked?		None

b. Describe how your agency tracks this information.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

BMP 02: Residential Plumbing Retrofit

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 10%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 5%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no

   a. If YES, when did your agency begin implementing this strategy?

   b. Describe your targeting/ marketing strategy.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	2624	685
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? no

   a. If YES, in what format are low-flow devices tracked?

   b. If yes, describe your tracking and distribution system :

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	yes
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	12441
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	13783
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.90
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	no
7. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

B. Survey Data

1. Total number of miles of distribution system line.	170.8
2. Number of miles of distribution system line surveyed.	170.8

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified

1. Volume of raw water supplied to the system:
2. Volume treated water supplied into the system:
3. Volume of water exported from the system:
4. Volume of billed authorized metered consumption:
5. Volume of billed authorized unmetered consumption:
6. Volume of unbilled authorized metered consumption:
7. Volume of unbilled authorized unmetered consumption:

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:		System Facility
2. How frequently are they tested and calibrated?		12
3. Length of mains:	170.8	170.8
4. What % of distribution mains are rigid pipes (metal, ac, concrete)?	100	100
5. Number of service connections:	10669	10669
6. What % of service connections are rigid pipes (metal)?	100	100
7. Are residential properties fully metered?		yes
8. Are non-residential properties fully metered?		yes
9. Provide an estimate of customer meter under-registration:	0	0
10. Average length of customer service line from the main to the point of the meter:		
11. Average system pressure:		95
12. Range of system pressures:		From 52 to 108
13. What percentage of the system is fed from gravity feed?		98
14. What percentage of the system is fed by pumping and re-pumping?		2

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?	Utility
2. Does your agency test, repair and replace your meters on a regular timed schedule?	yes
a. If yes, does your agency test by meter size or customer category?:	Meter Size
b. If yes to meter size, please provide the frequency of testing by meter size:	
Less than or equal to 1"	8 years
1.5" to 2"	8 years
3" and Larger	6 months
c. If yes to customer category, provide the frequency of testing by customer category:	
SF residential	
MF residential	

Commercial	
Industrial & Institutional	

3. Who is responsible for repairs to the customer lateral or customer service line?	Utility
4. Who is responsible for service line repairs downstream of the customer meter?	Utility
5. Does your agency proactively search for leaks using leak survey techniques or does your utility reactively repair leaks which are called in, or both?	both
6. What is the utility budget breakdown for:	
Leak Detection	$ 110,000
Leak Repair	$ 92,000
Auditing and Water Loss Evaluation	$ 25,000
Meter Testing	$ 125,000

H. Comments

Reported as of 9/30/10

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. Does your agency have any unmetered service connections? No

    a. If YES, has your agency completed a meter retrofit plan?

    b. If YES, number of previously unmetered accounts fitted with meters during report year:

2. Are all new service connections being metered and billed by volume of use? Yes

3. Are all new service connections being billed volumetrically with meters? Yes

4. Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? No

5. Please fill out the following matrix:

Account Type	Number of Metered Accounts	Number of Metered Accounts Read	Number of Metered Accounts Billed by Volume	Billing Frequency Per Year	Number of Volume Estimates
a. Single Family	6666	6666	6666	6	6403
b. Multi-Family	1900	1900	1900	6	2762
c. Commercial	1231	1231	1231	6	2249
d. Industrial	104	104	104	6	69
e. Institutional	156	156	156	6	0
f. Landscape Irrigation	34	34	34	6	73

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no

    a. If YES, when was the feasibility study conducted? (mm/dd/yy)

    b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters: 0

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/30/10

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2007**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	34
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	0
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	no

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	no
a. If YES, when did your agency begin implementing this strategy?	
b. Description of marketing / targeting strategy:	
2. Number of Surveys Offered during reporting year.	0
3. Number of Surveys Completed during reporting year.	0
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	no
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	no
d. Measure Landscape Area	no
e. Measure Total Irrigable Area	no
f. Provide Customer Report / Information	no
5. Do you track survey offers and results?	no
6. Does your agency provide follow-up surveys for previously completed surveys?	no
a. If YES, describe below:	

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.
Does your agency provide mixed-use accounts with landscape budgets? no

2. Number of CII mixed-use accounts with landscape budgets.

Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. (From BMP 4 report) 0

Total number of change-outs from mixed-use to dedicated irrigation meters since Base Year.

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	1	1	80
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

The City provides information on WBIC and rebates relating to such at various events and outreach opportunities. Information is included in flyers available at the Planning Dept. counter, on the City website, and ads.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? no

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

City disseminates low flow irrigation information at key community events(Flower and Garden Show and Earth Day) and through our website. In addition to the annual events, the department held a demonstration series (December 5-29, 2006; once a week) on water efficient devices, that included weather-based irrigation outreach materials, hands-on model to demonstrate function/programming, and video providing details on facts on proper irrigation and how to save. This also included information on nozzles.

E. Comments

Reported as of 9/30/10

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2007**

A. Coverage Goal

	Single Family	Multi-Family
1. Number of **residential** dwelling units in the agency service area.	6,666	1,426
2. Coverage Goal =	= **466 Points**	

B. Implementation

1. Does your agency offer rebates for **residential** high-efficiency washers? yes

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
2. **Greater than 8.5 but not exceeding 9.5** (1 point)	30	$ 0	$ 3,300	$ 0	$ 3,300	30
3. **Greater than 6.0 but not exceeding 8.5** (2 points)	0	$ 0	$ 0	$ 0	$ 0	0
4. **Less than or equal to 6.0** (3 points)	0	$ 0	$ 0	$ 0	$ 0	0
TOTALS:	**30**	**$ 0**	**$ 3,300**	**$ 0**	**$ 3,300**	**30**

C. Past Credit Points

For HEW incentives issued before July 1, 2004, select ONE of the following TWO options:

- Method One: Points based on HEW Water Factor
- Method Two: Agency earns 1 point for each HEW.

PAST CREDIT TOTALS:	**0**	**$ 0**	**0**

D. Rebate Program Expenditures

1. Average or Estimated Administration and Overhead $ 900
2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW? no

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 9/30/10

BMP 07: Public Information Programs

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both materially participate in program
Which wholesaler(s)?
Metropolitan Water District and City of Beverly Hills Metropolitan Water District of Southern California implements many of the programs that the city has available. In conjuction with the programs offered, the City provides additional flyers, cable and website information, bill inserts, ads etc. to supplement the marketing materials and provide outreach of MWD programs and in house programs/events. Metropolitan Water District (MWD) of Southern California and City of Beverly Hills

2. Describe the program and how it's organized:
Many of the publc outreach programs are inconjuction with MWD. For instance although the rebates we offer are through MWD, the city uses a portion of MWD brochures to promote, the city also uses its own design and created additional materials to further promote so that Beverly Hills residents are clear that this a program we are a part of and support.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	yes	6
b. Public Service Announcement	yes	4
c. Bill Inserts / Newsletters / Brochures	yes	6
d. Bill showing water usage in comparison to previous year's usage	no	
e. Demonstration Gardens	yes	1
f. Special Events, Media Events	yes	2
g. Speaker's Bureau	yes	1
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing) 8000

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City of Beverly Hills takes an active role in promoting water conservation in conjuction with what MWD offers. We provide water conservation materials, suggestions on how to save, pamplets to the children to bring to the parents, rulers to display droplet and water usaged from a drop of water, toilet tabs to indentify leaking toilets, reminders on pencils, cable information and website information.

D. Comments

The city's outreach program expands upon activities offered through Metropolitan Water District. The city puts ads in the local paper promoting water conservation using our taglines, providing outreach to students with the bookcovers including water saving images/information and other inhouse graphics promoting water efficiency. Water conservation items to help educate the public equated to approximately $8,700 including ads and items aside from Metropolitan Water District materials. In addition to MWD programming: Paid advertising = 6, Public Annoucements = 4, Bill Inserts etc = 6,Demonstration Garden = 1, Special Events/Media = 2 Student outreach events are offered and upon request of teacher.

Reported as of 9/30/10

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2007**

A. Implementation

1. How is your public information program implemented?
   Wholesaler implements program (none or minimal retailer participation)

Which wholesaler(s)?
   Metropolitan Water District of Southern California

Public Information Program Activity Reported By Wholesaler

Reported as of 9/30/10

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2007**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period:	no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0		
b. Number of New Surveys Completed	0		
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0		
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0		

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	# Awarded to Customers	Total $ Amount Awarded
h. Rebates	5000	448	20600
i. Loans	0	0	0

j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? yes

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? yes

7. **System Calculated** annual savings (AF/yr):

CII Programs	Avg Savings (AF/yr)	# Device Installations	Annual Savings/ Program (AF/yr)
a. Ultra Low Flush Toilets	.035004	330	11.55132
b. Dual Flush Toilets	.041748	0	0
c. High Efficiency Toilets	.041748	0	0
d. High-Efficiency Urinals	.069086	0	0
e. Non-Water Urinals	.0921146	0	0
f. Commercial Clothes Washers (only coin-op; not industrial)	.116618	0	0
g. Cooling Tower Conductivity Controllers	1.03225	0	0
h. Food Steamers	.25	0	0
i. Ice Machines	.834507	0	0
j. Pre-Rinse Spray Valves	.084701	0	0
k. Steam Sterilizer Retrofits	1.538	0	0
l. X-ray Film Processors	2.57	0	0
		Total System Calculated Savings:	11.55132

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency*:	0 (x 25%)

*Note: Agencies may credit **100%** of estimated annual savings of interventions that have been site verified and **25%** of estimated annual savings of interventions that have not been site verified. (BMP 9 E.4.c.)

TOTAL CII Program Performance Target Savings: 11.55132

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

City partners with MWD for CII accounts

Reported as of 9/30/10

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2007**

A. Implementation

Water Service Rate Structure Data by Customer Class

1. Single Family Residential

a. Rate Structure	Increasing Block
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 9,657,322
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$,

2. Multi-Family Residential

a. Rate Structure	Increasing Block
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 5,489,588
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

3. Commercial

a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 4,958,441
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

4. Industrial

a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 166,569
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

5. Institutional / Government

a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

6. Dedicated Irrigation (potable)

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 152,032
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

7. Recycled-Reclaimed

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

8. Raw

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

9. Other

a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

B. Implementation Options

Select Either Option 1 or Option 2:

1. Option 1: Use Annual Revenue As Reported

V/(V+M) >= 70% — Selected

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges

2. Option 2: Use Canadian Water & Wastewater Association Rate Design Model

V/(V+M) >= V'/(V'+M')

V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges
V' = The uniform volume rate based on the signatory's long-run incremental cost of service
M' = The associated meter charge

a. If you selected Option 2, has your agency submitted to the Council a completed Canadian Water & Wastewater Association rate design model?

b. Value for **V'** (uniform volume rate based on agency's long-run incremental cost of service) as determined by the Canadian Water & Wastewater Association rate design model:

c. Value for **M'** (meter charge associated with V' uniform volume rate) as determined by the Canadian Water & Wastewater Association rate design model:

C. Retail Wastewater (Sewer) Rate Structure Data by Customer Class

1. Does your agency provide sewer service? (If YES, answer questions 2 - 7 below, else continue to section D.) — yes

2. Single Family Residential

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 1,428,233
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 1,428,233

3. Multi-Family Residential

a. Sewer Rate Structure	Non-volumetric Flat Rate
b. Total Annual Revenue	$ 2,632,588
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 2,632,588

4. Commercial

a. Sewer Rate Structure	Uniform
b. Total Annual Revenue	$ 5,061,455
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 5,061,455

5. Industrial

a. Sewer Rate Structure	Uniform
b. Total Annual Revenue	$ 139,578
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 139,578

6. Institutional / Government

a. Sewer Rate Structure	Uniform
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

7. Recycled-reclaimed water

a. Sewer Rate Structure	Service Not Provided
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."
The City owns and operates the wastewater collection system that collects wastewater and discharges it to the L.A. City-operated Hyperion Treatment Plant. The City charges in accordance with the cost of service principles. Residents are assessed a fixed rate while non-residental customers are assessed a fixed charge; quantity charge; and a strength surcharge.

E. Comments

The City only tracks revenues at an aggreggate level and is, therefore, unable to determine volumetric revenues by class type.

Reported as of 9/30/10

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
City of Beverly Hills	**100% Complete**	**2007**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	yes
a. Partner agency's name:	Metropolitan Water District
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	25%
b. Coordinator's Name	Arnetta Eason
c. Coordinator's Title	Management Analyst
d. Coordinator's Experience in Number of Years	2 yrs
e. Date Coordinator's position was created (mm/dd/yyyy)	01/01/2005
4. Number of conservation staff (FTEs), including Conservation Coordinator.	.3

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	26000
2. BMP Program Implementation Expenditures	22000

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City does not have a full-time dedicated water conservation coordinator (most work being accomplished by a Management Analyst). It maintains its water conservation program and implements the Demand Management Measures through its staff, operators, inspectors and in collaboration with MWD.

D. Comments

Reported as of 9/30/10

BMP 13: Water Waste Prohibition

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Water Conservation Ordinance No.92-02139 prohibits water waste and calls for five stages (A through E) of increasingly restrictive consumption during drought times. Stage A calls for a 5% voluntary compliance while Stage E would be enacted during times of catastrophic interruptions and imposes misdemeanor charges.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of West Hollywood	WHMC 15.52

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding no

b. Single-pass cooling systems for new connections no

c. Non-recirculating systems in all new conveyor or car wash systems yes

d. Non-recirculating systems in all new commercial laundry systems no

e. Non-recirculating systems in all new decorative fountains no

f. Other, please name no

2. Describe measures that prohibit water uses listed above:

Certain prohibited actions are enacted in Stage B with mandatory compliance restricting use by 10%.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	no
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	no
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

Reported as of 9/30/10

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
City of Beverly Hills

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

Number of Non-Efficient Toilets Replaced With 1.6 gpf Toilets During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	57	41
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**57**	**41**

Number of Non-Efficient Toilets Replaced With 1.28 gpf High-Efficiency Toilets (HETs) During Report Year

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate	37	0
8. Direct Install	0	0
9. CBO Distribution	0	0
10. Other	0	0
Total	**37**	**0**

Number of Non-Efficient Toilets Replaced With 1.2 gpf HETs (Dual-Flush) During Report Year

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	7	2
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0

Total	**7**	**2**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for single-family residences.

Residents submit rebate applications which they can find on the City's website. These are then reviewed for eligibility. If applications aren't approved, thank you letters are sent out otherwise rebates are issued.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

Residents submit rebate applications which they can find on the City's website. These are then reviewed for eligibility. If applications aren't approved, thank you letters are sent out otherwise rebates are issued.

18. Is a toilet retrofit on resale ordinance in effect for your service area? no

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

B. Residential ULFT Program Expenditures

1. Estimated cost per replacement: $ 0

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Appendix I: Baseline & Compliance (2020) Per Capita Analysis

City of Beverly Hills 2010 Urban Water Management Plan

City of Beverly Hills
SBx7-7 Baseline & Target Spreadsheet

Calendar Yr. (CY)	Total Pot. Consumption	Service Area Population	GPCD
2009	12,653	45,003	251
2008	13,453	44,647	269
2007	14,007	44,343	282
2006	13,286	44,093	269
2005	13,280	43,910	270
2004	14,042	43,832	286
2003	13,583	43,619	278
2002	13,598	42,896	283
2001	13,598	42,595	285
2000	14,093	41,660	302
1999	13,545	43,186	280
1998	13,139	42,346	277
1997	13,659	41,904	291
1996	13,368	41,583	287
		5-Yr. Baseline (CY 2003-2007)	**277**
		Minimum Reduction	**263**
		Baseline (CY 1996-2005)	**284**
		2020 Target (80% of Baseline)	**228**
		2020 Target (95% of Regional)	**141.5**
		Final 2020 Target	**141.5**
		Final 2015 Target	**256**
		Recent (FY 2010) Use	**228**

<u>The Final 2020 Compliance Target for Beverly Hills is 228 GPCD</u>

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