2010

City of Lomita
Urban Water Management Plan

May, 2011
Draft Copy

This Page Left Blank Intentionally

2010

URBAN WATER MANAGEMENT PLAN

City of Lomita, CA

May 2011 Draft Copy

Prepared by:

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

This Page Left Blank Intentionally

TABLE OF CONTENTS

Section 1: Introduction

Section 2: Water Sources & Supplies

Section 3: Water Quality

Section 4: Water Demands

Section 5: Reliability Planning

Section 5: Reliability Planning (cont.)

Section 6: Conservation Measures

Section 7: Water Shortage Contingency Plan

Section 8: Water Recycling

Appendices

SECTION 1: INTRODUCTION

1.1 PURPOSE AND SUMMARY

This is the 2010 Urban Water Management Plan (UWMP) for the City of Lomita (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 its target 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 June 28, 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 on July 12, 2011. 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.

Table 1.1
Coordination and Public Involvement

	Participated In Plan Preparation	Contacted for Assistance	Commented on Draft	Notified of Public Hearing	Attended Public Hearing
Lomita Water Staff	x	x	x	x	x
City Public Works Dept		x	x	x	x
City Manager's Office				x	x
Lomita City Council				x	x
The Metropolitan Water District of Southern California		x		x	x
CA Dept of Water Resources				x	
LA County Dept. of Public Works				x	
City of Torrance				x	
Interested General Public			x	x	x

1.3 FORMAT OF THE PLAN

The chapters in this 2010 Plan correspond to the items presented in the Act and are as follows:

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 served 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 West Coast Basin. In addition, this chapter discusses potential future water supplies, including transfers and exchanges, recycled water, and desalinated water.

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 Demand

This chapter describes past, current and projected water usage within the City's service area. This chapter also discusses the requirement of the Water Conservation Act of 2009 (SBx7-7).

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 available water supplies under three different hydrologic conditions: 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 – Demand Management

This chapter addresses the City's implementation of 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 response plan to water shortages (City Ordinance No. 479), 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 City's Water System was owned and operated by the Los Angeles County Waterworks District No. 13 (District). The District was initially granted a water supply permit in August 1954. The City's water was supplied by several wells, and a Metropolitan 12-inch connection for imported water.

Figure 1.1: Metropolitan Water District (MWD)

In 1990, ownership of the water system was transferred to the City. Since then, the City has handled the operations, maintenance, and upgrading of the system. The District has been retained as a contractor to primarily work on the water quality monitoring, which includes collections, sampling, analyses, and production of the

annual water quality report; the written correspondence between the system and the regulatory agencies; and meter protection. The City's Water Department performs most maintenance activities such as new installations, pipeline repair and flushing, valve exercising, and telemetry. The Lomita City Council governs the City Water Department.

1.5 WATER SERVICE AREA

The City was incorporated in 1964, and is located 26 miles south of downtown Los Angeles and is bounded by the City of Torrance to the north and west; the City of Los Angeles to the east; the City of Rolling Hills Estates on the southwest; and the City of Rancho Palos Verdes and unincorporated County area to the north. The City's total area is 1,261 acres or 1.97 square miles.

Figure 1.2: City of Lomita

The water service area comprises about 95 percent of the population residing within the City limits, with a small area (211 homes) south of Via Madonna served by Golden State Water Company. **Figure 1.4** shows the City's boundary and the Water Service area.

The City is a retail agency and within WBMWD's service area, which includes 17 cities. The City of Lomita along with the cities of Hermosa Beach, Manhattan Beach, Redondo Beach and a portion of Torrance constitute Division 3 of the WBMWD's five divisions. The residents of each division elect a representative that serves a four-year term on the five-member Board of Directors, which governs the District policies and activities. The City is continually coordinating with WBMWD on its programs

1.6 CLIMATE

The City has a Mediterranean climate with moderate, dry summers with an average temperature of about 80°F and cool, wet winters with an average temperature of 67°F. The average rainfall for the region is approximately 14 inches. Evapotranspiration (ETo) in the region averages 49.7 inches annually. **Table 1.2** lists the average ETo, temperatures and rainfall for the City

Table 1.2
Climate Characteristics
(WorldClimate.com)

Month	Rainfall (in)	ETo (in)
Jan	3.1	1.9
Feb	2.9	2.2
Mar	2.2	3.4
Apr	0.9	4.8
May	0.1	5.6
Jun	0.0	6.3
Jul	0.0	6.5
Aug	0.1	6.2
Sep	0.2	4.8
Oct	0.3	3.7
Nov	1.3	2.4
Dec	2.2	1.9
Totals:	**13.5**	**49.7**

Overall, the City' service area climate characteristics are comparable to other cities within the region.

1.7 POPULATION

According to the most recent population figures from the California Department of Finance, the current 2010 resident population of the City is approximately 21,000 persons. Since the City's service area accounts for about 95% of the City's total residents, the total current resident population served by the City's water system is approximately 19,960 persons. Population growth over the past 10 years is approximately 0.5%. Population projections in accordance with an annual growth rate of 0.5% over the next 25 years are shown in **Table 1.3**:

Table 1.3
Service Area Population Projections

Year	Service Area Population	Citywide Population
2015	20,463	21,540
2020	20,975	22,079
2025	21,499	22,631
2030	22,037	23,197
2035	22,588	23,777

Since the City is a not a major commercial center for the region, daytime populations estimates are not significantly higher than the City's resident population. However, the City does experience some increases in daytime population due to the City's location near the Los Angeles Harbor and Palos Verdes Peninsula that affect water demand.

1.8 WATER SYSTEM

Imported Water

The City's imported water supply is delivered through its connection to West Basin MWD (WBMWD), which receives water from MWD's Feeder System that is fully treated at their Weymouth Treatment Plant. The City has one 12-inch connection and one 8-inch connection that are designated as West Basin 7 (WB-7) and West Basin 8 (WB-8). The total capacity of 5,161 gallons per minute (gpm). MWD has no restriction on the amount of water that the City receives through these connections.

Figure 1.3: Weymouth Treatment Plant

Groundwater

The City produces groundwater from one groundwater well (Well No. 5).Well No. 5 is located adjacent to the City's Cypress Reservoir and has a capacity of 1,500 gpm. Well No. 5 has experienced primary water quality issues in the past (iron, manganes) that has prevented its use. The City has remediated the primary water quality issues with the well and over the past five years the well has been inactive due only to secondary (aesthetic) water quality issues.

Distribution System

The City distributes water to approximately 4,200 service customers through a 41 mile network of distribution mains ranging from 4 to 16 inches in size. The water system consists of two pressure zones that provide modified pressure to customers. The water service area and zoning map are shown in **Figures 1.4** and **1.5** on the following page.

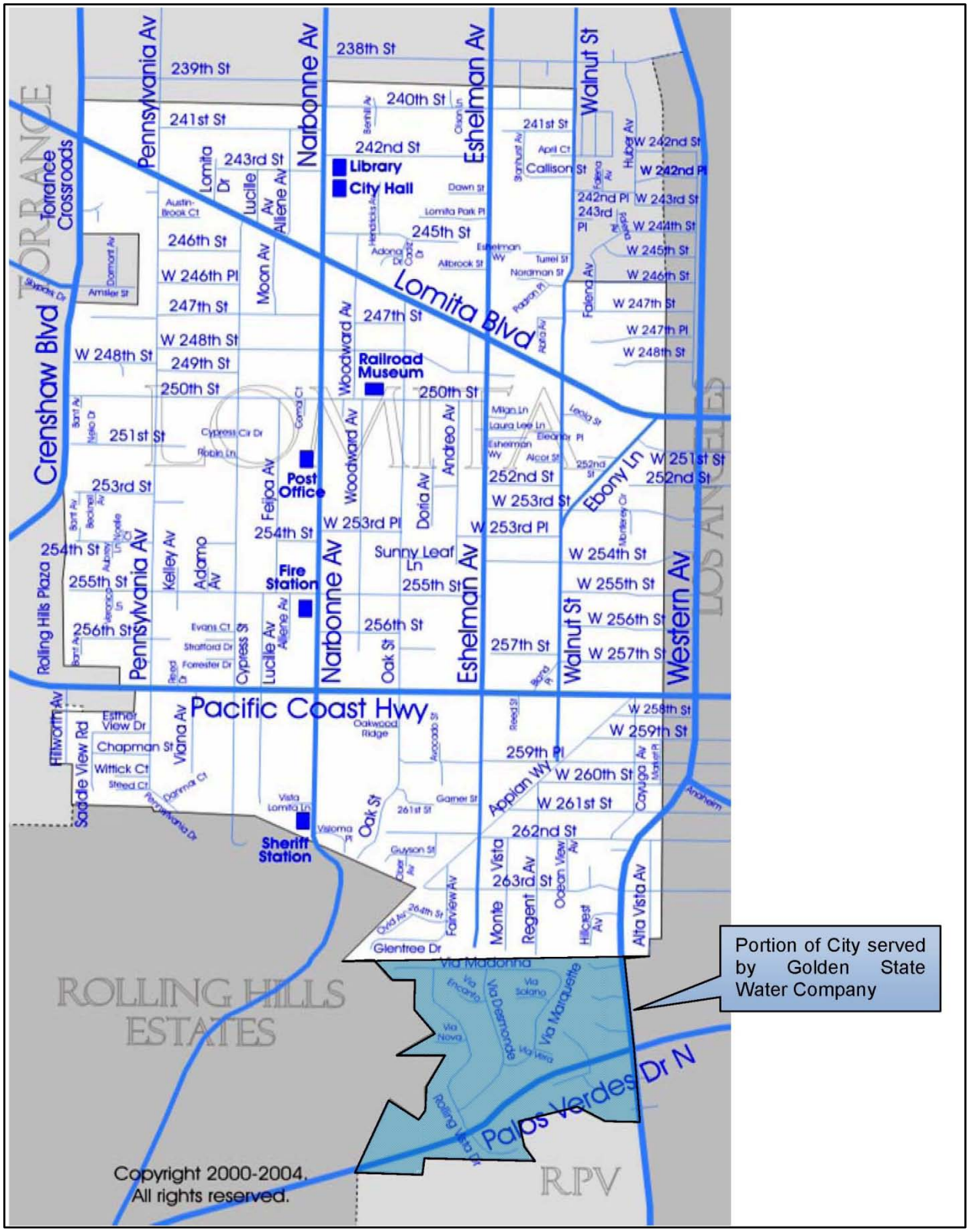

Figure 1.4: City of Lomita Water Service Area

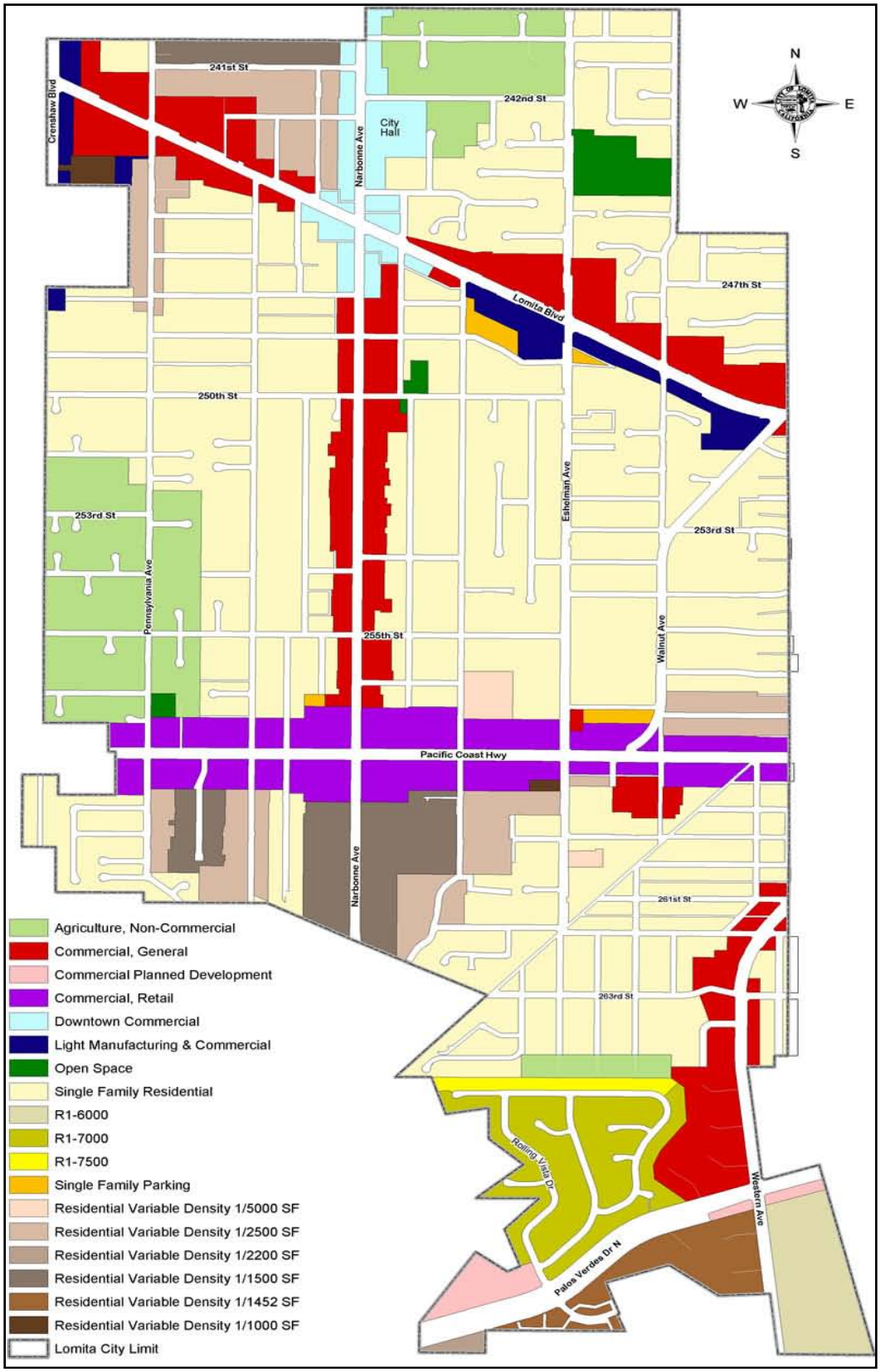

Figure 1.5: City of Lomita Zoning Map

Water Storage

For storage needs, the City of Lomita maintains operating reservoirs with a combined storage capacity of 5.55 MG. The Cypress Reservoir is located adjacent to the City's domestic water well (Well No 5) and has a capacity of 5.5 MG. The Harbor Hills reservoir is an elevated steel tank with a 50,000 gallon capacity that is located at 1876 Palos Verdes Drive North.

Figure 1.6: Cypress Reservoir

Table 1.4 lists ALW's reservoirs:

Table 1.4
City of Lomita Reservoirs

Reservoir	Capacity (Gal)
Cypress	5,500,000
Harbor Hills	50,000
Total Capacity:	**5.55 MG**

Emergency Interconnections

In addition to its imported water connection with WBMWD, the City's water system has three emergency connections. One connection is with the City of Los Angeles and the other two connections are with the City of Torrance. These three connections allow water to flow to the City's water system during emergencies. Maintaining the system pressure beyond the connections is the City's responsibility.

SECTION 2: WATER SOURCES & SUPPLIES

2.1 INTRODUCTION

The City's water supply sources consist of imported water from the Metropolitan Water District (MWD) via the West Basin Municipal Water District (WBMWD) and groundwater produced from the West Coast Groundwater Basin.

2.2 WATER SUPPLY SOURCES

Imported Water

The City has access to imported water from the Colorado River and the Sacramento-San Joaquin River Delta in Northern California. These two water systems provide Southern California with over 2 million acre-feet (MAF) of water annually for urban uses.

The Colorado River supplies California with 4.4 MAF annually for agricultural and urban uses with approximately 3.85 MAF used for agriculture in Imperial and Riverside Counties. The remaining unused portion (600,000 - 800,000 AF) is used for urban purposes in MWD's service area.

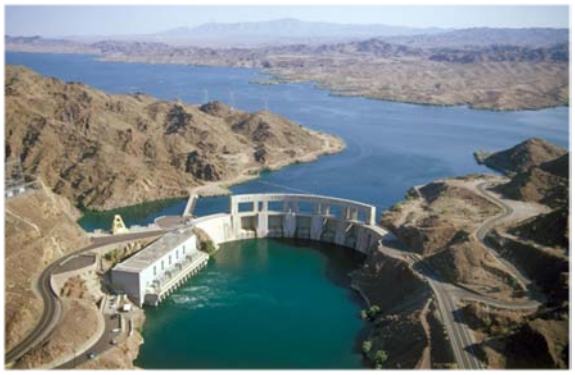

Figure 2.1: Parker Dam at Colorado River

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 Southern California 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.

Imported Water Purchases

As a wholesale agency, MWD distributes imported water to 26 member agencies throughout Southern California as shown in **Figure 2.6**. WBMWD is one of 11 wholesale agencies served by MWD. WBMWD distributes water to its retail agencies, including the City of Lomita, as shown in **Figure 2.7**. The City has two imported connections to WBMWD with capacities of 1,800 gpm (about 2,900 AFY) and 3,350 gpm (about 5,400 AFY).

Table 2.1 presents the City's five-year historic imported water purchases from 2005 to 2010:

Table 2.1
Imported Water Supply 2005-2010
(Purchases from WBMWD)

Year	Purchases (AF)
2010	2,342
2009	2,501
2008	2,681
2007	2,596
2006	2,644
2005	2,791
Average:	**2,553**

Although the City's combined imported connection capacity is about 8,300 AFY, the amount of imported water available to the City is dependent on WBMWD's supplies from MWD. In 2005, WBMWD's Tier 1 limit from MWD was 156,874 AFY and in 2010 the limit was 156,874 AFY.

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

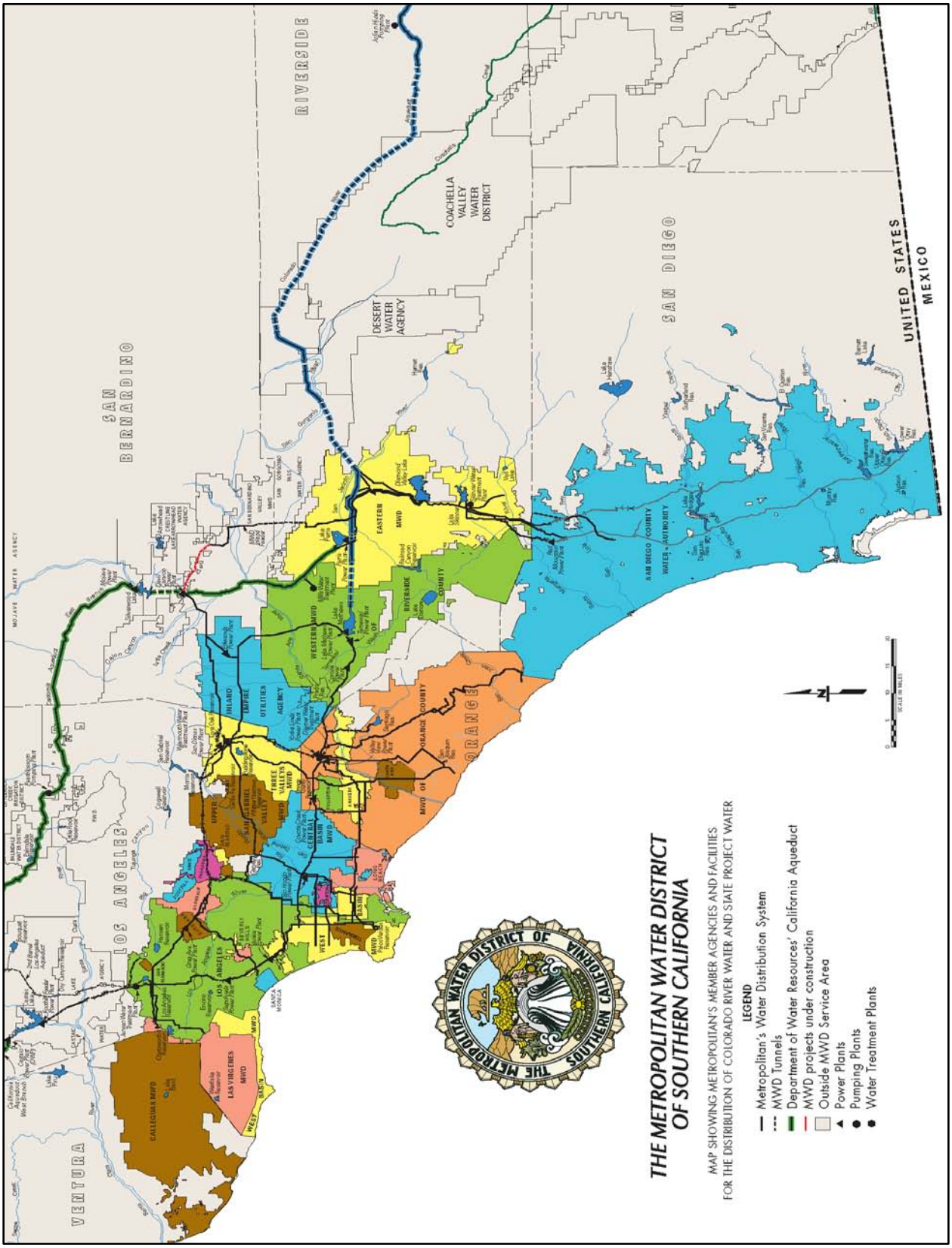

Figure 2.6: MWD Service Area Map

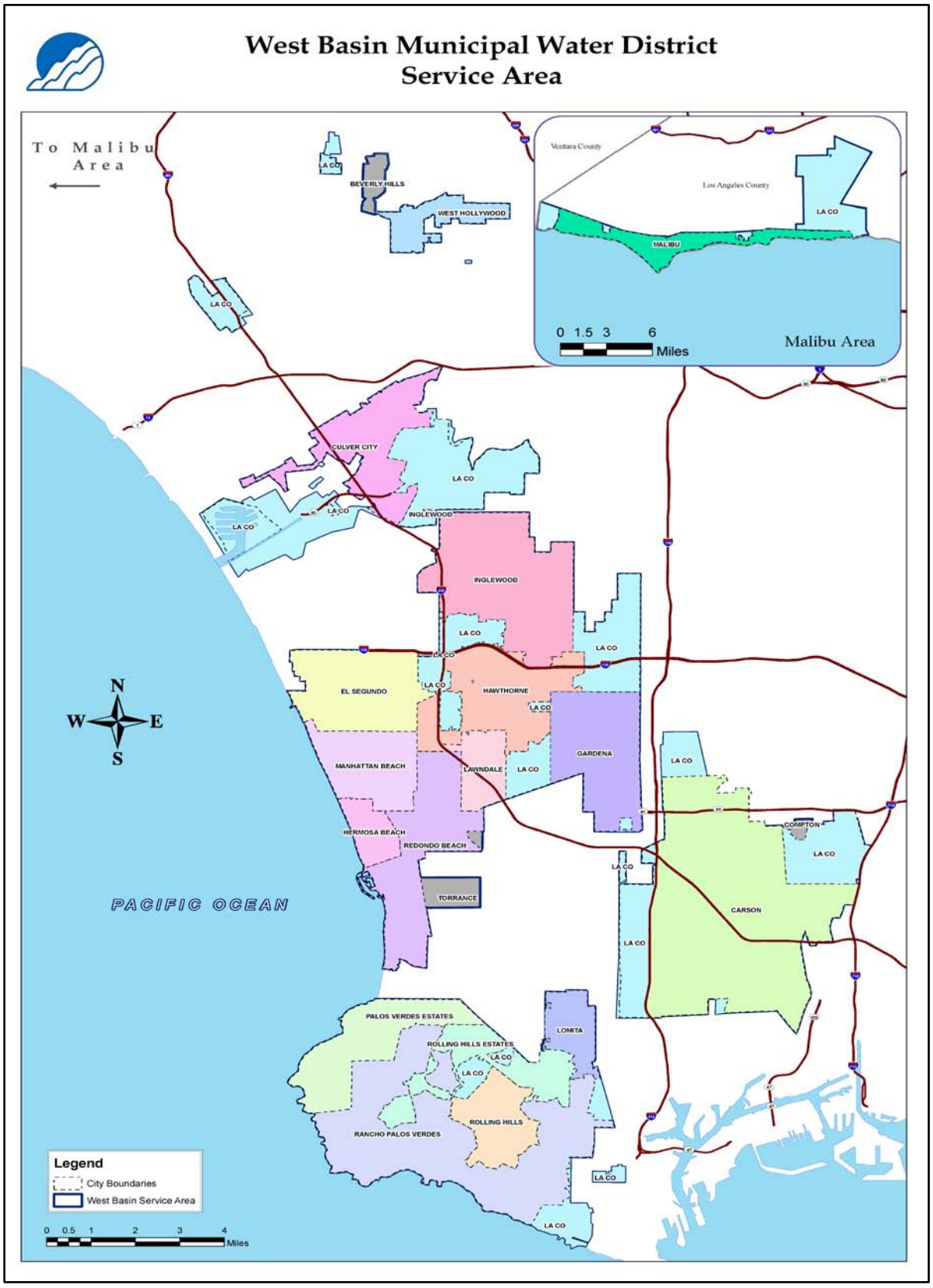

Figure 2.7: WBMWD Service Area Map

Groundwater

The City obtains its groundwater supply from the West Coast Groundwater Basin. The basin is located in western Los Angeles County and overlies the entire City of Torrance and all or portions of eleven (11) other cities in the region. The Basin has a surface area of 142 square miles of flat to hilly terrain. The basin is bounded by the Ballona Escarpment (Bluffs) to the North, consolidated rocks of the Palos Verdes Hills and the Pacific Ocean to the South, the Newport-Inglewood fault to the East, and the Pacific Ocean to the West. Adjacent groundwater basins include the Santa Monica, Central, and Orange County Basins as shown in **Figure 2.7** below.

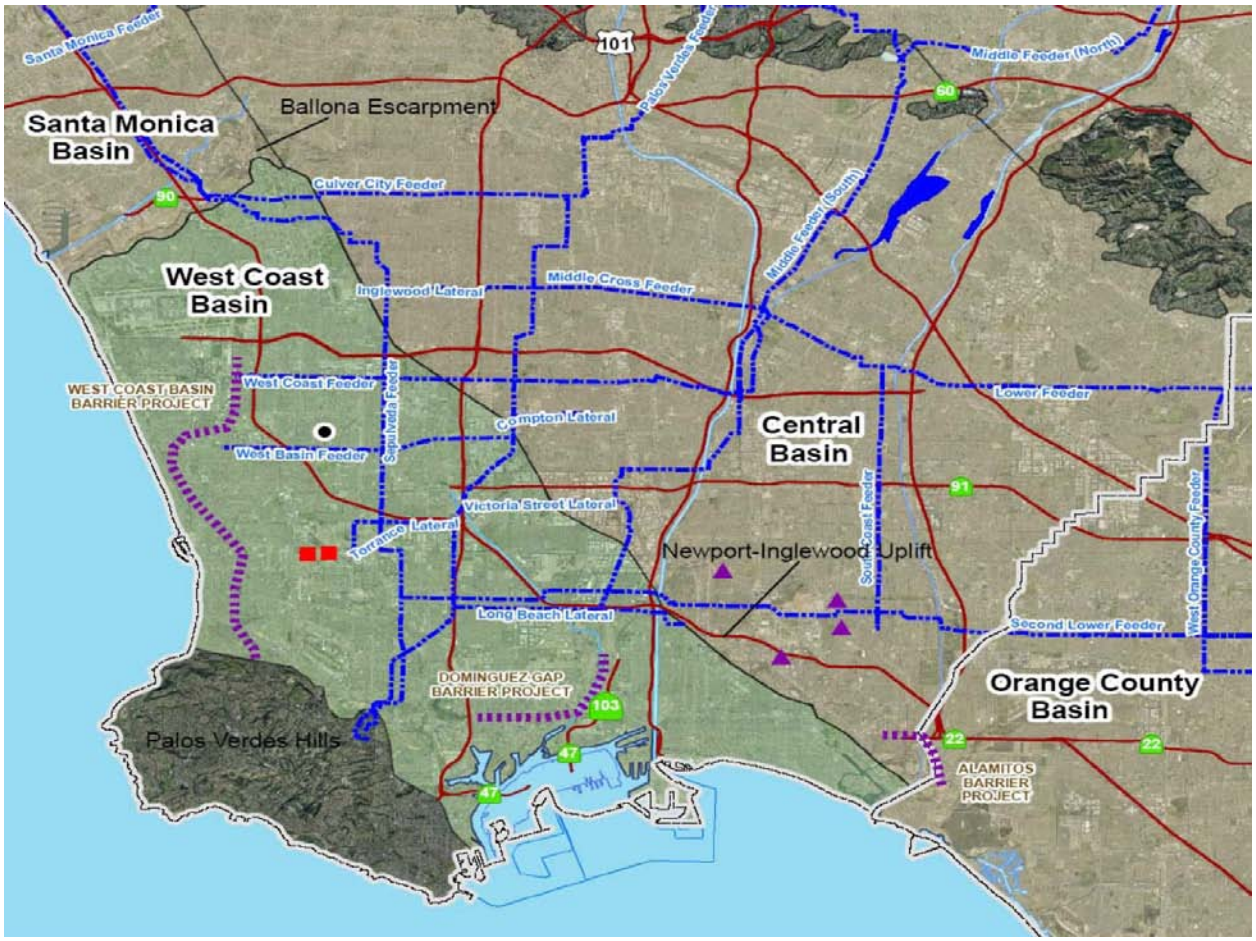

Figure 2.8: West Coast Groundwater Basin

Water-bearing deposits of the West Coast Basin include unconsolidated and semi-consolidated marine and alluvial sediments deposited over time. Key production aquifers include the Gardena, Gage, Lynwood, and Silverado aquifers. Groundwater is mainly confined, although the Gage and Gardena aquifers are unconfined where water levels have dropped below the Bellflower aquiclude. The Silverado aquifer, which underlies most of the basin, is the most productive aquifer in the basin, yielding up to 90 percent of the groundwater extracted annually with a thickness of 100-500 feet. Minor yield comes from the Gage, Gardena, and Lynwood aquifers.

Groundwater in the Basin is replenished naturally by percolation from precipitation, receiving an average annual precipitation of about 14 inches, by subsurface inflows from the Central Basin to the East, and by infiltration of surface inflows from the Los Angeles and San Gabriel Rivers. Since the basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, natural replenishment to the basin's water-bearing formations is limited to only a small portion of basin soils. However, the basin receives additional replenishment provided by artificial re-charge from the Water Replenishment District's (WRD's) injection wells.

Groundwater flow in the basin is generally from the Ballona Escarpment in the North and the Central Basin to the East towards the Pacific Ocean in the West and Palos Verdes Hills in the South. Typical flow patterns are southward and westward.

Figure 2.9: Palos Verdes Hills

The total storage in the basin is estimated to be approximately 6.5 million acre-feet (MAF). Unused storage is estimated to be approximately 1.1 MAF. In 2006, a natural safe yield of the Basin (natural replenishment only) was estimated by WRD to be about 26,000 AFY. As a result of artificial recharge activities, the adjudicated rights stand at 64,468.25 AFY.

Groundwater levels in the basin are generally at or above mean sea level (MSL), although low water levels in portions of aquifers underlying the Pacific Ocean allow for seawater intrusion to occur. WRD estimates that up to 7,100 AFY of seawater enters portions of aquifers on the West Coast Basin.

Figure 2.10: Ballona Creek & Escarpment (Bluffs)

Due to seawater intrusion, there are a two seawater intrusion barriers in the West Coast Basin: the West Coast Basin Barrier Project and the Dominguez Gap Barrier Project. These seawater intrusion barriers inject a combined average of 24,000 AFY along the coastline and the Dominguez Channel to protect the basin from seawater intrusion.

Due to the natural replenishment of the basin and existing additional artificial recharge by WRD, there are no spreading basins in the West Coast Basin. In an effort to eliminate long-term overdraft conditions, WRD closely monitors the groundwater basins for fluctuations in groundwater levels. WRD utilizes a groundwater model developed by the United States Geological Survey (USGS) to study and better understand the Basin's reaction to pumping and recharge. WRD works closely with the Los Angeles County Department of Public Works, Metropolitan, and LACSD on current and future replenishment supplies

The West Coast Basin is an adjudicated basin and the management of water resources and operations in the basin is provided by WRD, DWR, the LA County Department of Public Works, and the Regional Water Quality Control Board. 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 West Coast Basin are summarized below in **Table 2.2**:

Table 2.2
West Coast Basin
Summary of Characteristics

Item	Amount
Max. Depth to Groundwater	2,000 ft.
Thickness of Groundwater Table	180-1,050 ft.
Storage	6.5 MAF
Natural Safe Yield	26,300 AFY
Adjudicated Rights	64,468 AFY
Spreading Basins (Total)	0
Seawater Intrusion Barriers	2
Desalters	2

Groundwater Production

The City maintains one active well (Well No. 5) for groundwater extraction. Well No. 5 has a depth of 660 feet and a capacity of 1,500 gpm. Since 1990, the well has experienced high levels of iron, manganese, and hydrogen sulfide odors. As a result of remediation efforts, groundwater produced from the well has improved although the well is currently in standby mode due to secondary (aesthetic) water quality standards. As part of the City's work to re-initiate its groundwater production, the City recently constructed a 5.0 MG reservoir adjacent to Well No. 5 (Cypress Reservoir) for emergency storage and to improve fire-flow capacity. The tank's capacity is equal to about a two-day supply of water for the City. The City also maintains a 50,000 elevated steel storage tank

Figure 2.11: Cypress Reservoir

Well No. 5 is currently used only on an as-needed basis for fire flow demands or other emergencies and is equipped with a flowmeter to measure water production. Water production, when the well is re-activated for potable use, will be recorded monthly by City water staff and reported annually to the Department of Water Resources (DWR) as in previous years. Over the past five years, the City has not produced any groundwater from Well No. 5 other than for water quality testing purposes.

2.3 WATER SUPPLY SUMMARY

Over the past five years, the City's lack of groundwater pumping ability has led the City to rely almost entirely on imported water. Due to rising costs of imported water, the City has undergone efforts to remediate the groundwater quality issues with Well No. 5, and expects the well to be in operation within the next few years.

2.4 PROJECTED SUPPLY OUTLOOK

The City expects to reduce their dependency on imported water through groundwater production from its Well No. 5. The City may also begin to use Recycled water for irrigation and indoor plumbing uses in the future, although the City has no specific plans in place to use recycled water. **Table 2.3** displays the City's projected supply availability outlook:

Table 2.3
Projected Water Supply Availability

Year	Imported (AF)	Ground (AF)
2015	2,230	1,352
2020	2,661	1,352
2025	2,920	1,352
2030	2,863	1,352
2035	2,821	1,352

In the near future, the City's overall water supply reliability is expected to increase through reliable groundwater supplies from Well No. 5 while maintaining continued access to imported water, and through the potential use of recycled water. 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: Reliability Planning** discusses reliability issues and compares the City's projected water supply availability to projected demands for normal, dry, and multiple dry years through 2035.

2.5 ALTERNATE WATER 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, with its own visitor's education center.

Figure 2.12: 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 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 2.11.**

Figure 2.13: Edward C. Little Recycling Facility

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.

Wastewater Collection & Treatment System

All of the wastewater flows from the City are collected by the Los Angeles County Sanitation District (CSD) sewer lines and routed to the Joint Water Pollution Control Plant (JWPCP) in the City of Carson. The maximum design flow of the JWPCP is 385 MGD and the maximum design peak flow is 540 MGD. Treated wastewater from the JWPCP is disposed into an outfall in the Pacific Ocean located two miles offshore from White Point on the Palos Verdes Peninsula. The depth of the discharge point is approximately 200 feet below sea level. The JWPCP has an advanced primary treatment with 60 percent secondary treatment.

Figure 2.14: Clarifier Treating Wastewater

Municipal wastewater is generated in the City's service area from a combination of residential, commercial, and industrial sources. The quantities of wastewater generated are generally proportional to the population and the water used in the service area. Because all wastewater treated at the JWPCP is discharged to the ocean, none of the City's wastewater is treated to recycled water standards.

Recycled Wastewater Use

Currently the City benefits from the use of imported water purchased from WBMWD and groundwater extracted from the West Coast Groundwater Basin. The City does not use recycled wastewater. However, the City benefits indirectly from regional uses of recycled wastewater. **Section 8: Recycled Water** contains more information on recycled water use in WBMWD's service area.

Recycled Stormwater

Santa Monica Example

The City of Santa Monica completed its Santa Monica Urban Runoff Recycling

Facility (SMURRF) in 2002. The primary objectives of the facility was to eliminate contamination of the Santa Monica Bay caused by urban runoff and to provide cost-effective treatment for producing high-quality water for reuse in landscape irrigation and indoor plumbing. The SMURRF project was funded by City of Santa Monica, City of Los Angeles, State Water Resources Control Board, Metropolitan Water District, federal ISTEA Grant funds and Los Angeles County Proposition "A" Grants and is operated jointly by the cities of Santa Monica and Los Angeles.

Figure 2.15: Water Treatment at SMURRF Facility

The facility treats urban runoff from the Pico-Kenter and Pier drains year-round and is designed to routinely treat 500,000 gallons per day (0.5 MGD) with a peak of 750,000 gallons per day (0.75 MGD). It removes all types of urban runoff contaminants that previously discharged into Santa Monica Bay, treats the water to Title 22 state standards and is considered a BMP by the Regional Water Quality Control Board. The treated water is then pumped through a City-wide distribution system that serves parks, medians, Woodlawn Cemetery and dual-plumbed buildings. The facility has helped the City in increasing land use densities while decreasing its need for additional potable supplies.

In addition to reducing pollutants entering the Bay and increasing supply reliability, the SMURRF was designed to increase public awareness of Santa Monica Bay pollution and alternative water uses. The SMURRF is located in a prominent tourist location adjacent to the Santa Monica pier and provides a new access to the beach through a walkway from which visitors can view the facility. As a walk-through facility, visitors can see the array of the equipment at two separate overlook points. Each piece of equipment is laid out in a logical format and water is daylighted at five separate points allowing visitors to view the purification process. Educational material about the workings of the facility, are also available. Due to its strategic location, the SMURRF has enhanced community pride and indirectly increased water conservation awareness.

Potential Use of Recycled Stormwater

The Lomita City boundaries, unlike the City of Santa Monica, do not extend to the ocean. Thus, the City does not have environmental motives for recycling stormwater. In addition, the construction and maintenance costs associated with a stormwater recycling plant would prohibit the City from considering such a facility as a means to provide an alternative water supply.

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.

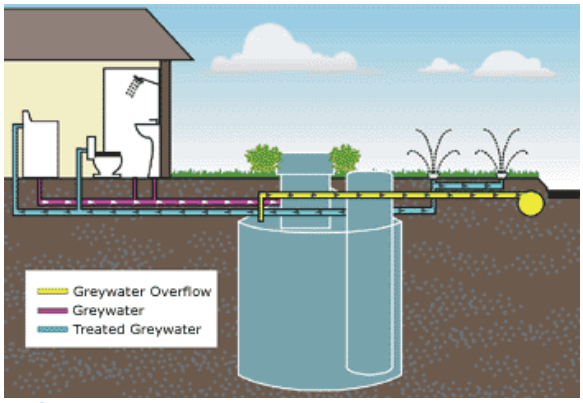

Figure 2.16: Graywater System

The promotion of graywater systems as a means to reduce ALW's overall water use is not recommended since the use of graywater is currently limited to subsurface irrigation and therefore the overall service area-wide reduction in water use (in AF) would be minimal at best. With the recent passage of SB 1258, however, graywater use is expected to be expanded to include use for toilet flushing, and may have its place as a potential water supply. The City does not currently have a formal program in place to support graywater use.

Desalinated Seawater

Seawater desalination is a process whereby seawater is treated to remove salts and other contents 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 conservation. With its Seawater Desalination Program (SDP), the MWD facilitates progress and provides financial incentives for the development of seawater desalination facilities within its service area. A total of five member agencies submitted projects totaling 142,000 AFY. In 2004, MWD adopted an Integrated IRP update which included a desalination goal of 150,000 AFY by the year 2025. Currently, the five member agency projects are in various levels of development.

Figure 2.17: Seawater Desalination Plant

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 TRANSFER OR EXHCHANGES

Short Term

The City owns rights to extract 1,352 AF of groundwater annually; however, due to water quality issues with its Well No. 5, the City has not extracted groundwater expect for emergency and water quality testing purposes only. Since the City does not maintain any other groundwater wells, the

City is may experience interruptions of its groundwater production over short-term periods of up to a few years. Thus, the City has the opportunity during periods of inactivity of groundwater production to lease some or all of its groundwater rights to other agencies to offset some of the financial burdens of purchasing imported water. Likewise, the City may be able to lease additional groundwater rights from other agencies. However, the City has not entered into any lease agreements for groundwater supplies.

Additionally, the City has two interconnections with the City of Torrance and one interconnection the City of Los Angeles which are capable of transferring water to the City during emergencies.

Long Term

Over the long term, the City expects to reduce dependency on imported water while increasing water use efficiency. Groundwater is expected provide the majority of the City's water supplies while imported water will be purchased to meet the gap between total demand and groundwater production. Since the City' population is not expected to increase significantly, the City does not forsee a need to lease or purchase groundwater rights as a long-term practice.

2.7 PLANNED SUPPLY PROJECTS

The City continually reviews practices that will provide its customers with adequate and reliable supplies. Trained staff continues to ensure the water quality is safe and the water supply will meet present and future needs in an environmentally and economically responsible manner. The City consistently coordinates its long-term water shortage planning with WBMWD and WRD.

The City’s water demand within its service area could remain relatively constant over the next 25 years due to minimal population growth combined with water use efficiency measures and the potential use of recycled water. Any new water supply sources will be to replace or upgrade insufficient wells rather than to support population growth and new development. The projects that have been identified to improve the City’s water supply reliability and enhance the operations of the City's facilities include replacement of water meters, fire hydrants, valves, and pipelines.

SECTION 3: WATER QUALITY

3.1 WATER QUALITY SUMMARY

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. MWD 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 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.

General Water Quality Concerns

In nearly every source of water, microbiological contaminants exist which require treatment. 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.

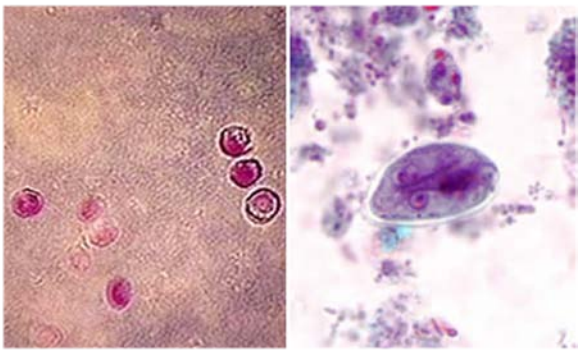

Figure 3.2: Cytosporidium (L) and Giardia (R)

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 Water Quality Concerns

Salinity

Water imported from the Colorado River via the Colorado River Aqueduct (CRA) has the highest level of salinity of all of MWD'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 & 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. MWD routinely monitors perchlorate at 34 locations within its system and levels currently remain at non-detectable levels (below 2 µg/L). MWD 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 Water Quality Concerns

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, MWD'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 Imported Water Quality Concerns

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.

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 MWD's water treatment plants.

Figure 3.6: Water Treatment at MWD's F.E. Weymouth Treatment Plant

West Coast Basin Groundwater Quality

In addition to imported water quality concerns, the City is also concerned with groundwater quality pumped from the West Coast Basin. In general, groundwater in the main producing aquifers of the basins is of good quality with average total dissolved solids (TDS) concentrations around 500 mg/L. Localized areas of marginal to poor water quality exist, primarily on the basin margins and in the shallower and deeper aquifers impacted by seawater intrusion.

As part of the Basin's groundwater quality monitoring, WRD and the U.S. Geological Survey (USGS) began a cooperative study in 1995 to improve the understanding of the geohydrology and geochemistry of Central and West Coast Basins. Out of this effort

came WRD's geographic information system (GIS) and the Regional Groundwater Monitoring Program. Twenty-one depth-specific, nested monitoring wells located throughout the basin allow water quality and groundwater levels to be evaluated on an aquifer-specific basis. Regional Groundwater Monitoring Reports are published by WRD for each water year. Constituents monitored include: TDS, iron, manganese, nitrate, TCE, PCE, arsenic, chromium including hexavalent chromium, MTBE, and perchlorate.

West Coast Basin Constituents of Concern

Most production wells in the West Coast Basin have TDS concentrations less than 750 mg/L with a range of 150 to 13,600 mg/L in the monitoring wells measured by WRD. Higher TDS concentrations found in production wells in Torrance/Hawthorne area and in monitoring wells within the brackish plume.

Organic constituents of concern (TCE, PCE, or perchlorate) were not detected in concentrations above applicable MCLs in the West Coast Basin. Neither TCE nor PCE were detected in any production well in the West Coast Basin. TCE was detected in three monitoring wells and PCE was detected in one monitoring well. Nitrate (as nitrogen) concentrations range from non-detect to 12 mg/L in the monitoring wells in the West Coast Basin.. Production wells have nitrate concentrations less than 3 mg/L. Iron and manganese were detected in concentrations above the secondary MCL for these constituents in both monitoring wells and production wells in the basin. Nearly one-third of all production wells in northwestern portion of West Coast Basin have concentrations that exceed secondary MCL for iron. Seventeen of 30 production wells tested had concentrations above secondary MCL for manganese. **Table 3.1** summarizes the Basin Groundwater Constituents of concern:

Table 3.1
West Coast Groundwater Basin
Constituents of Concern

Constituent	Units	Range	Description
TDS Secondary MCL = 500	mg/L	150 to 13,600 Average: 500	Most production wells have TDS less than 750 mg/L. Higher TDS concentrations found in production wells in Torrance/Hawthorne area and in monitoring wells within saline plume.
VOCs **(TCE and PCE)** Primary MCL for TCE = 5 Primary MCL for PCE = 5	µg/L	ND to 18 for TCE ND to 0.8 for PCE	TCE nor PCE not detected in production wells. TCE detected in three monitoring wells. PCE detected in one monitoring well.
Perchlorate Notification level = 6	µg/L	Data not available	Detected in three monitoring wells below action level in shallow zones
Nitrate (as N) Primary MCL = 10	mg/L	ND to 12 mg/L	Higher concentrations tend to be limited to the uppermost zones and are likely due to localized infiltration and leaching. Production wells have concentrations less than three mg/L.

Table 3.1 (cont.)
West Coast Groundwater Basin
Constituents of Concern

Constituent	Units	Range	Description
Iron and manganese Secondary MCL for iron: 0.3 Secondary MCL for Mn: 0.05	mg/L	ND to 1.2 for iron and manganese	Nearly 1/3 of all production wells in northwestern portion of West Coast Basin exceed secondary MCL for iron. 17 of 30 production wells tested had concentrations above secondary MCL for manganese
Chloride Secondary MCL = 500	mg/L	5.8 to 6,180 mg/L	Chloride concentrations exceed chloride MCL in five of 15 nested monitoring wells due to seawater intrusion. One production well had concentrations above MCL.

Other Special Interest Constituents

In addition to the above constituents, WRD has identified special interest constituents including arsenic, hexavalent chromium, MTBE, total organic carbon, apparent color, and perchlorate as additional water quality issues.

Arsenic

As of January 2006, the federal arsenic MCL for domestic water supplies is 10 ug/L. Three monitoring wells have had past arsenic concentrations between 10 and 50 ug/L and one monitoring well had an arsenic concentration of 68 ug/L.

Hexavalent Chromium

Hexavalent chromium, or chromium 6, is an oxidized form of chromium 3 that is a known carcinogen when inhaled. Currently, the MCL for all forms of chromium is 50 ug/L. Hexavalent chromium was not detected in any of the production wells in the Basin.

Methyl Tertiary-Butyl Ether (MTBE)

The health effects of MTBE are uncertain. The EPA currently classifies MTBE as a possible human carcinogen. The MCL for MTBE is 13 ug/L. The WRD monitoring wells have not shown detection of MTBE.

Total Organic Carbon

Total organic carbon is the measure of the organics in water and provides an indication of the potential formation of disinfectant\ byproducts. There is no MCL for total organic carbon; however, seven of the 15 production wells tested greater then 5 mg/L for total organic carbon.

Apparent Color

Although apparent color in groundwater is not harmful, an MCL of 15 apparent color units has been established for aesthetic reasons. City Wells #7 and #8 have been observed to produce excessive water color.

Perchlorate

As of 2004, the public health goal for perchlorate ais 6 ug/L. To date, however, DHS has not set a regulatory drinking water standard. Perchlorate has been detected in three monitoring wells in the Basin at levels below the Public Health Goal.

3.4 EFFECTS ON MANAGEMENT & SUPPLY RELIABILITY

The previous section summarized the general water quality issues of MWD's imported water and the Basin's groundwater supplies. The same water quality concerns apply to the City's water supply. Groundwater is not currently being pumped for the City, as its only groundwater well (Well No. 5) is inactive due to secondary (aesthetic) water quality issues. Well No. 5 was drilled and installed in 1971. Since 1990, it had been shut-down due to high iron, manganese, hardness (as CaCO3), and hydrogen sulfide odors in the groundwater. Rehabilitation work relating to a treatment system to treat the groundwater has recently been completed along with the construction of a 5.0 MG Cypress Reservoir adjacent to the well site. Once secondary remediation efforts are complete, the City will pump up to its 1,352 AFY right.

Except for the water quality issues with Well No. 5, the City has not experienced any significant water quality problems in the past and does not anticipate any significant changes in the future. In 2006, EPA's Stage 2 regulation of the disinfection byproducts rule took effect. Stage 1 was implemented in 2002 and lowered the total THM maximum annual average concentration level in water supplies; Stage 2 further lowered the THM concentration level. The City's water supplies (imported water from MWD) meet the requirements of Stage 1 and 2. Therefore, the City does not anticipate any negative changes in its available water supplies due to water quality issues in part because of the mitigation actions undertaken by MWD, WBMWD, and WRD as described earlier.

SECTION 4: WATER DEMANDS

4.1 INTRODUCTION

Water use within the City is variable and depends on a number of factors which range from irrigation to industrial use and from inefficient plumbing to water losses. Changes in residential plumbing fixtures and customer usage habits can significantly affect water usage for most agencies. This section explores the water usage trends within the City and quantifies total usage per customer type. In addition, the provisions of the Water Conservation Act of 2009 (SBx7-7) are explored in detail.

4.2 CURRENT CITY WATER NEEDS

The City of Lomita, like many other cities of Southern California, began as a small, rural community with some agricultural uses and throughout the years has transformed into a suburban town. In 1964 when the City was incorporated, the City's population was under 20,000 persons and the City continued to grow at a rate of over 200 persons per year.

The City's population growth rate has decreased in the past 20 years and is currently under 0.5 percent annually. The City is approaching ultimate "built-out" with remaining expected future water demands primarily attributable to possible land use changes in residential densities and in-fill land development projects. Due in part to this slowed growth, the City's water use over the past 15 years has been fairly consistent and recent total water consumption reported for calendar year 2009 is slightly less than total water consumption reported for calendar years 1995 through 1997. As a result, the City of Lomita's local groundwater sources and imported supply capacity put the City in a position of providing a reliable source of quality water for its water users due to this consistency of water demands.

Figure 4.1: Residential Irrigation

The City of Lomita supports water conservation while maintaining the beauty of its community parks, schools, and recreational facilities both in the private and in the public sector. Since the City is zoned mainly for residential use and the majority of residential water consumption in the City is used for non-personal purposes (i.e. irrigation, car washing, etc), the City has a significant number of residential lots which require consistent irrigation to maintain landscapes. Of the water used for personal purposes, the majority of water consumed is attributable to toilet flushing and clothes washing.

In the commercial and institutional sector, water needs vary as customers range from restaurants to offices and from retail stores to schools. Office buildings and retail stores require significantly less water than

restaurants and schools and are not usually the key focus of water conservation efforts.

In order to maintain civic pride and a sense of community, City parks and other City right of ways (medians, etc.) require consistent irrigation. To prevent water waste the City follows a irrigation schedule that limits the length of irrigation to avoid overspray runoff and also eliminates evapotranspiration from daytime watering.

Figure 4.2: Lomita Park

Overall water use characteristics within the City's service area reflect slightly lower than average regional water use characteristics within Southern California. As a result of these water needs, the City has passed a conservation ordinance similar to other agencies which limits or restricts non-personal water use during periods of drought to conserve water use for the more important health and safety needs of its customers. The City's Conservation Ordinance is discussed in greater detail in **Section 7**.

4.3 HISTORIC WATER DEMAND

Water demands within the City's service area over the past five years are met by groundwater from the West Coast Basin and imported water from WBMWD. Annual water use since 2005 has ranged from about 2,342 AFY to 2,681 AF as shown below in **Table 4.1**:

Table 4.1
Five-Year Historic Total Water Consumption

Year	Consumption (AF)
2009	2,342
2008	2,501
2007	2,681
2006	2,596
2005	2,644
Average:	**2,553**

As indicated by **Table 4.1** above, annual water use fluctuates each year and is dependent on climatologic conditions.

4.4 WATER USE STATISTICS

The City maintains records of water consumption and bills its customers on a monthly basis for its water service. the City maintains approximately 4,000 service connections with a mixture of residential, commercial, institutional, and industrial customers. The City maintains records of its single family accounts. Multi-family accounts are combined with commercial and institutional accounts. However, for billing purposes, does not separate water use by sector. The City records water use per service connection only and bills customers based on a single water rate structure. Water sales data is compiled by City water staff and recorded on DWR's Form No. 38 (Public Water System Statistics) and submitted to DWR annually. The total number of service connections and total water consumption since 2005 is shown below in **Tables 4.2** and **4.3**:

Table 4.2
Number of Service Connections 2005-2010

Sector	2005	2006	2007	2008	2009
Single Family Residential	2,781	2,787	2,793	2,798	2,810
Multi-Family Residential	927	930	932	935	940
Commercial/Institutional	393	394	396	397	400
Landscape Irrigation	51	51	51	50	50
Other	0	2	4	6	10
Total Connections:	**4,161**	**4,171**	**4,181**	**4,190**	**4,210**

Table 4.3
Water Demand By Sector (AF) 2005-2010

Sector	2005	2006	2007	2008	2009
Single Family Residential	1,644	1,613	1,668	1,560	1,452
Multi-Family Residential	535	525	543	508	473
Commercial/Institutional	246	241	249	233	217
Landscape Irrigation	35	34	36	33	31
Other	9	9	9	8	8
Total Water Sales	**2,469**	**2,422**	**2,505**	**2,343**	**2,181**
Unaccounted For System Losses	175	174	176	158	161
Total Water Consumption (Total Supply Into System)	**2,644**	**2,596**	**2,681**	**2,501**	**2,342**

As indicated by **Table 4.3** above, the City's unaccounted for water ranged from 158 to 176 AF (about 6.5 percent of the total water supply into the City's distribution system. Unaccounted for water consists of routine flushing, unmetered use, and water losses. Although water losses at or near the 10% range (not untypical of many water agencies), have cost impacts on water agencies, they cannot be prevented entirely. Instead, effort is given to controlling the quantity of water losses (to a cost-effective extent) in order to reduce the cost impact of water losses on water operations.

4.5 WATER CONSERVATION ACT

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.

Figure 4.5: California's 2020 Water Conservation Goals

In addition to an overall statewide 20% water use reduction, the objective of SBx7-7 is to reduce water use in within each hydrologic region in accordance with the agricultural and urban water needs of each region. Currently, the Department of Water Resources (DWR) recognizes 10 separate hydrologic regions in California as shown in **Figure 4.5**. Each hydrologic region has been established for planning purposes and corresponds to the State's major drainage areas. The City of Lomita 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.

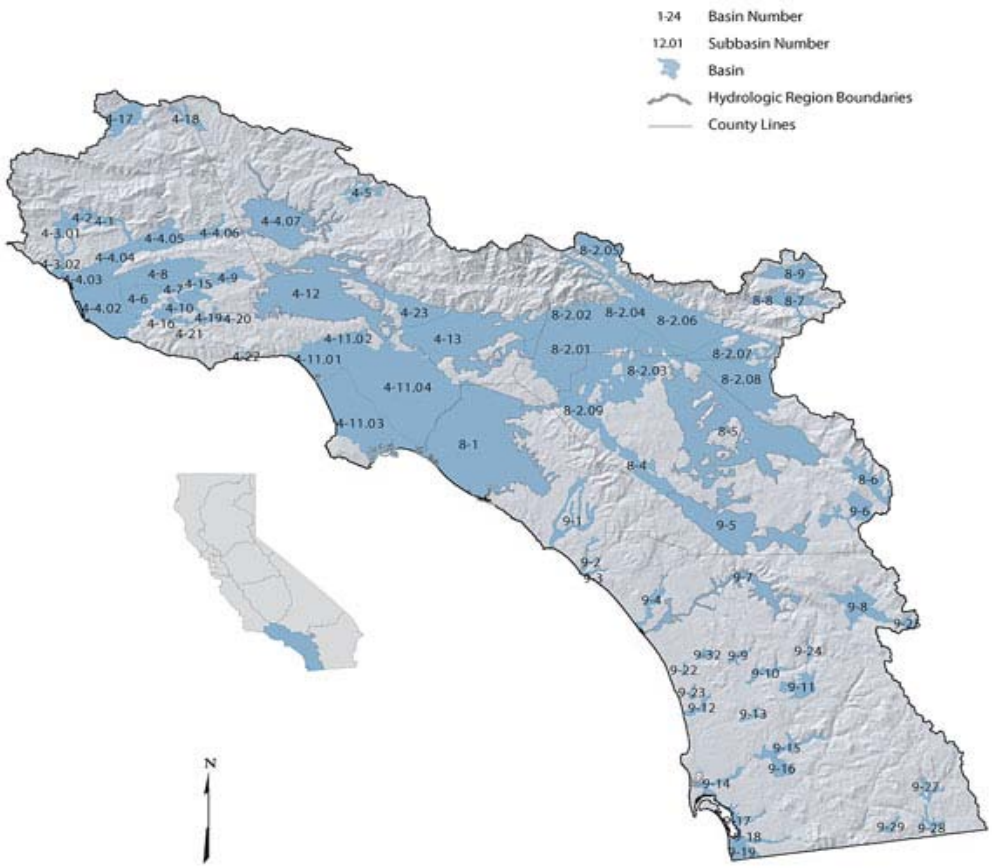

Figure 4.6: South Coast Hydrologic Region

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 procedure on the following page:

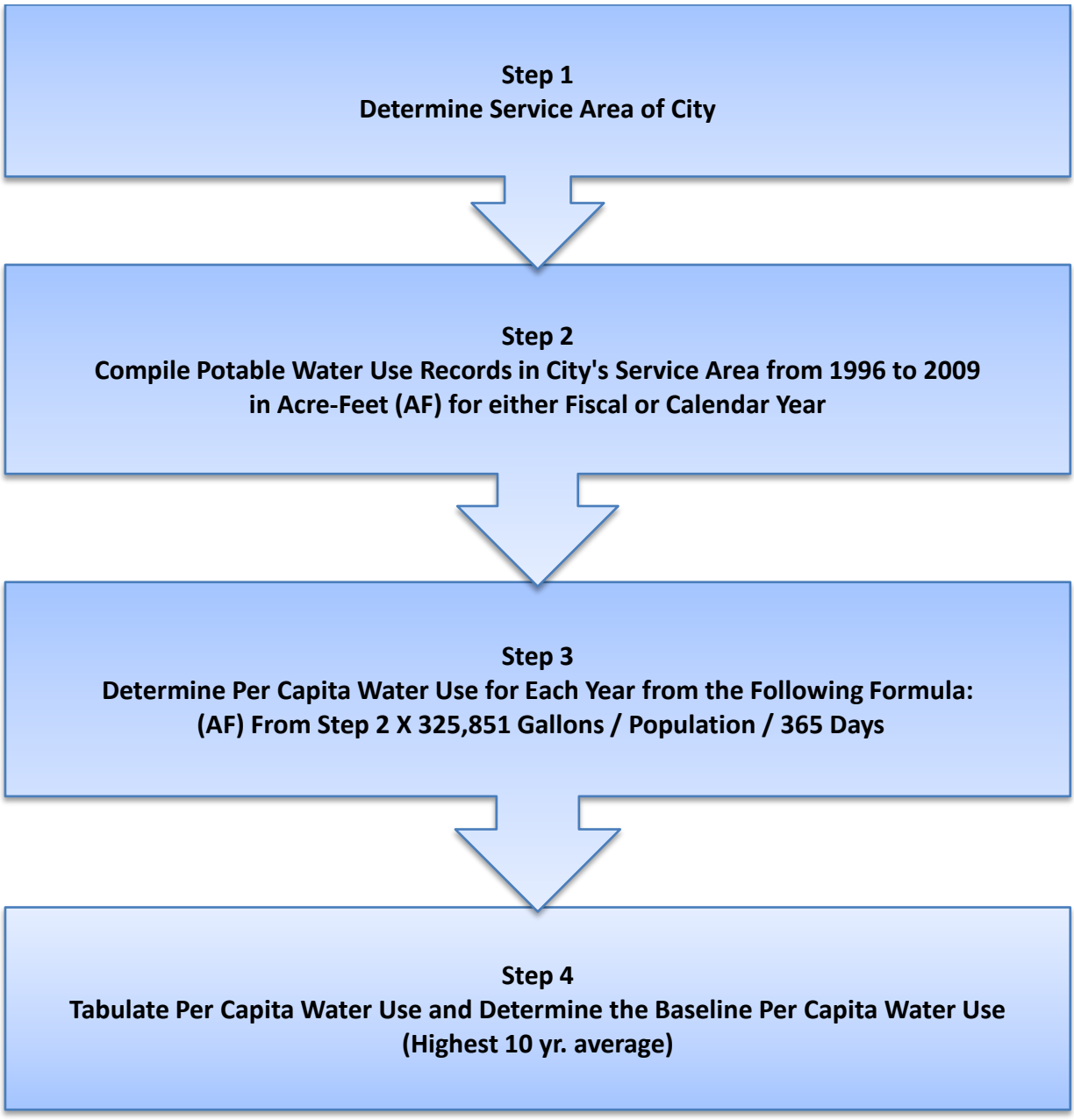

Figure 4.7: Procedure for Determining Baseline Per Capita Water Use

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

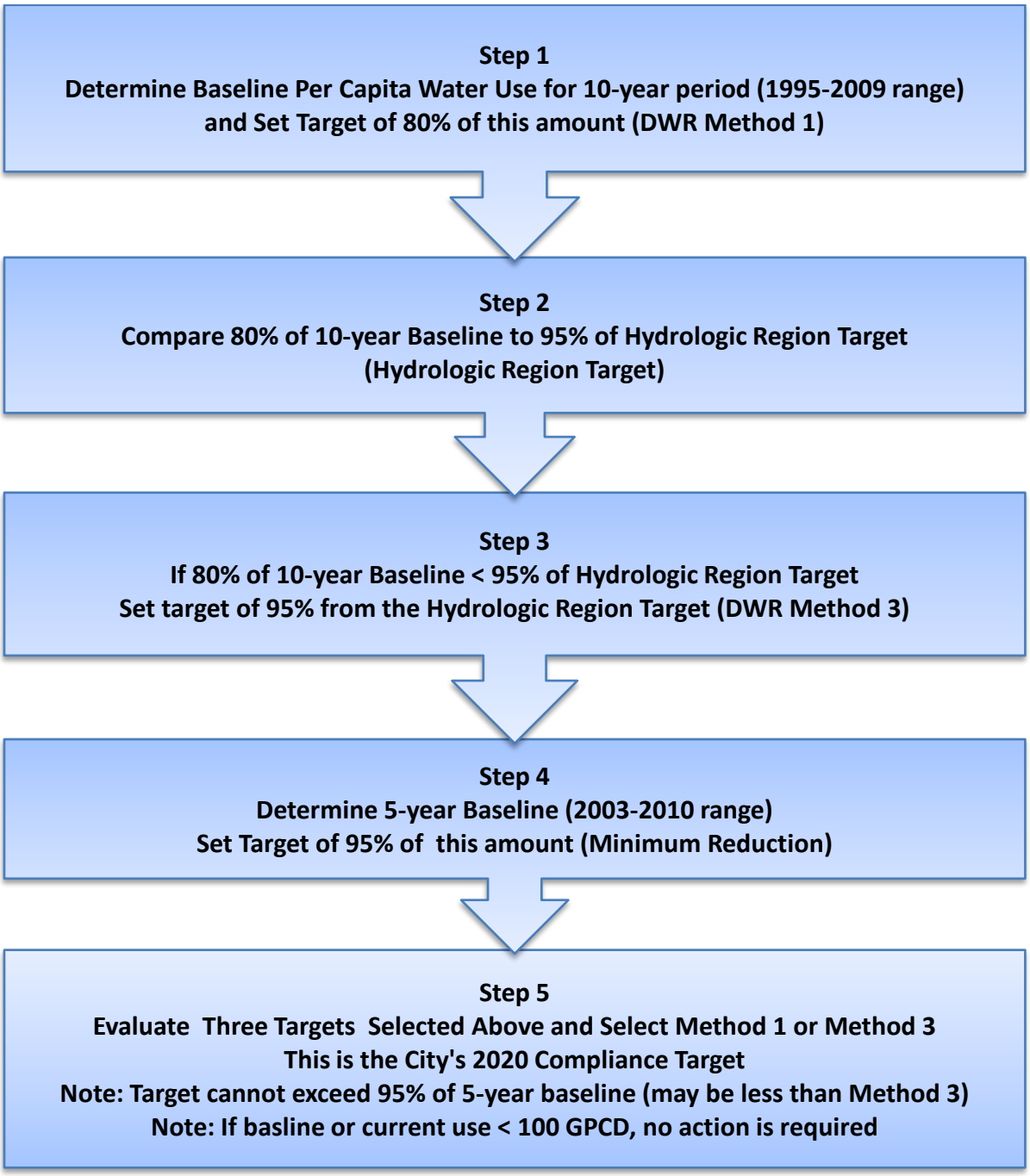

Figure 4.8: Procedure for Determining 2020 Water Use Target

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** above. 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 moderate water usages, such as Los Angeles, (baseline of 150.6 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 Los Angeles:

Table 4.4
Reduction Example for Los Angeles
(Baseline = 150.6 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)
143.07	120.5	141.5
2020 Per Capita Target:		**141.5**
Interim (2015) Target:		**146.1**

As indicated by the above table, the City of Los Angeles cannot select a minimum reduction requirement of 143.07 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 Los Angeles's 20% reduction target (120.5 GPCD) is less than the minimum reduction requirement that is required by DWR (141.5 GPCD), it is feasible to select 141.5 GPCD as its 2020 water use target.

Like the City of Los Angeles, water consumption characteristics in the City are low to moderate due to socio-economic conditions and a commitment to efficient water use. This indicates that the City will not have to adhere to the strict provisions of SBx7-7.

To determine the City of Lomita's historic per capita water use and to set 10-yr. and 5-yr. baselines, water use data was gathered from 1995-2009 and the City's baseline was determined as shown below in **Table 4.5:**

Table 4.5
City of Lomita
Historic Water Use

Year	Total Potable Consumption (AF)	Per Capita (GPCD)
2009	2,342	105
2008	2,501	112
2007	2,681	120
2006	2,596	116
2005	2,644	118
2004	2,791	125
2003	2,822	128
2002	2,835	129
2001	2,681	124
2000	2,768	130
1999	2,741	131
1998	2,588	124
1997	2,376	114
1996	2,649	128
1995	2,555	123
10 yr. Baseline (1995-2004) (SB7: 10608.20)		**126**
5 yr. Baseline (2003-2007) (SB7: 10608.22)		**121**
South Coast HR:		**180**

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 Los Angeles 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 Lomita
SBx7-7 2020 Water Use Targets

Min. Reduction Requirement (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
115	101	141.5
	2020 Per Capita Target:	115
	Interim (2015) Target:	118
	2009 Per Capita Water Use:	105

As indicated by the above table, the City can select a minimum reduction requirement of 115 GPCD (5% from its five year baseline) as this amount is less than 141.5 GPCD (5% reduction from the South Coast HR's regional target). Therefore 10608.22 applies to the City. In addition, since the City's 20% reduction target (100.3 GPCD) far exceeds the minimum reduction requirement of 115 GPCD, it is feasible for the City to select 115 GPCD as its 2020 water use target. Therefore, the City's compliance target for 2020 per capita water consumption is 115 GPCD in accordance with 10608.22.

Although the requirements of SBx7-7 seem stringent, it is noteworthy to mention that the City has seen an increase in water efficiency from 1995-2010. This is due in part to a greater achievement of conservation measures, saturation of water-saving plumbing fixtures, and overall water conservation awareness.

SBx7-7 Impacts

By maintaining low consumption rates and achieving 100% local sustainability, 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 motives are debatable, ensuring a reliable supply of water for human use is a top priority. Through conservation measures and the use of renewable, local groundwater supplies, the City can reduce demand for Bay-Delta water.

Figure 4.9: Bay-Delta Water Must Be Preserved

With increased public awareness of conservation requirements, it is likely that the public will begin to understand the importance of water conservation and will begin to use water even more efficiently.

4.6 PROJECTED WATER DEMAND

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 Water Conservation Plan (Ordinance 479 -see Section 7). As the City's population continues to grow mildly over time and as water conservation measures continue to be implemented, the City should experience only mild increases in its water consumption over the long term due mostly to overall population increases (along with very limited redevelopment). Per capita consumption rates, however, should be expected to remain under 115 GPCD (in accordance with SBx7-7) and trend further below the 2009 rate of 128 GPCD (in accordance with water use trends in the City). For planning purposes, the City's projected water use for 2015-2035 is broken down by sector in **Table 4.7** below:

Table 4.7
Projected Water Demand By Sector 2015-2035
(Based on SBx7-7 Conservation Rate of 115 GPCD)

Sector	2015	2020	2025	2030	2035
Single Family Residential	1,639	1,680	1,722	1,765	1,809
Multi-Family Residential	534	547	561	575	589
Commercial/Institutional	245	251	257	264	270
Landscape Irrigation	35	36	37	38	39
Other	9	9	9	9	10
Total Sales:	**2,461**	**2,523**	**2,586**	**2,650**	**2,717**
Unaccounted For Water	175	179	184	188	193
Total Water Use (Total Supply Into System)	**2,636**	**2,702**	**2,769**	**2,839**	**2,910**

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 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.

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 1991, the City enacted a Water Conservation Plan (Ordinance 479), 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.

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

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

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 yer, 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 due to 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.35 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. 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 which induce increase in demand. 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**:

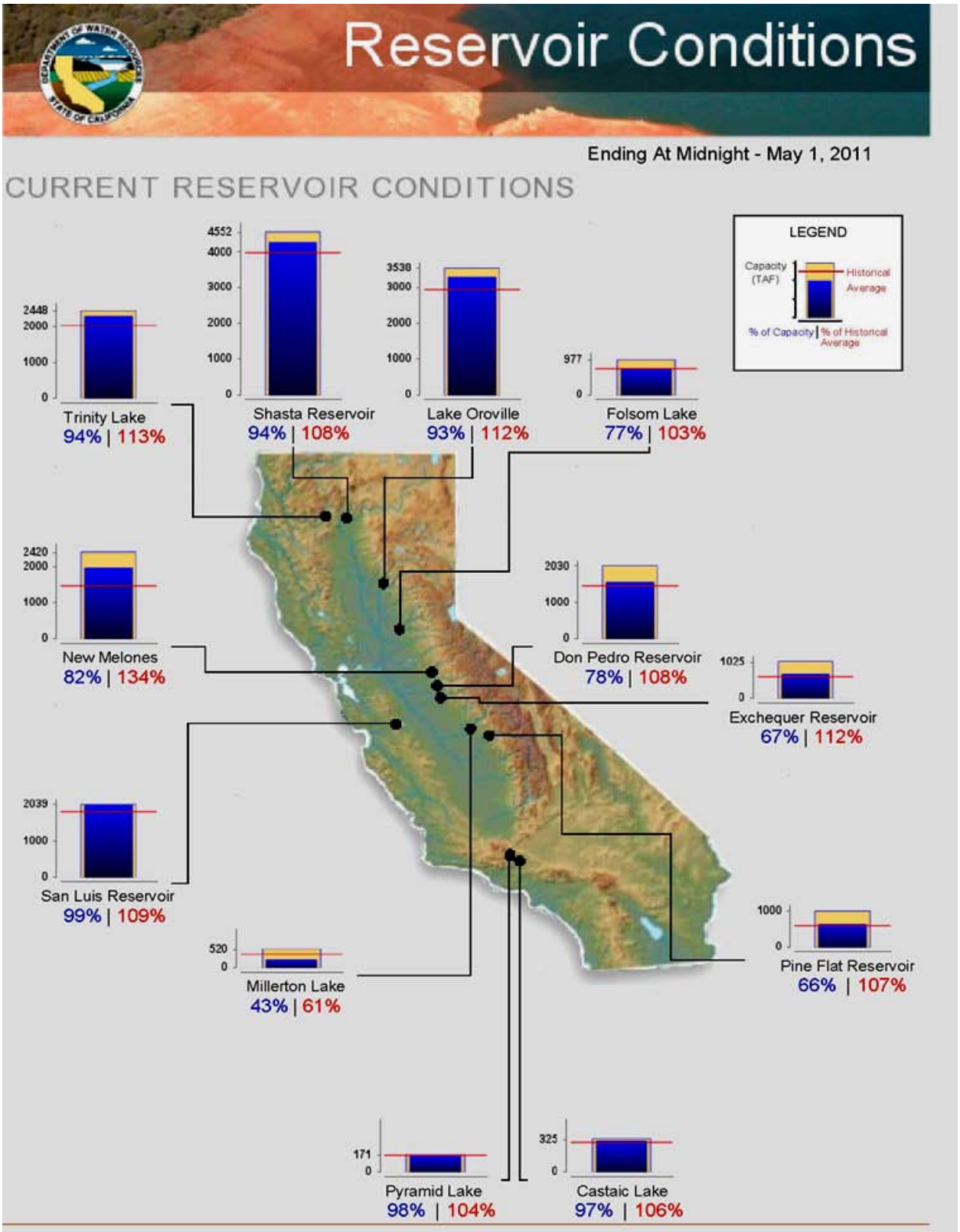

Figure 5.4: California State Reservoir Levels

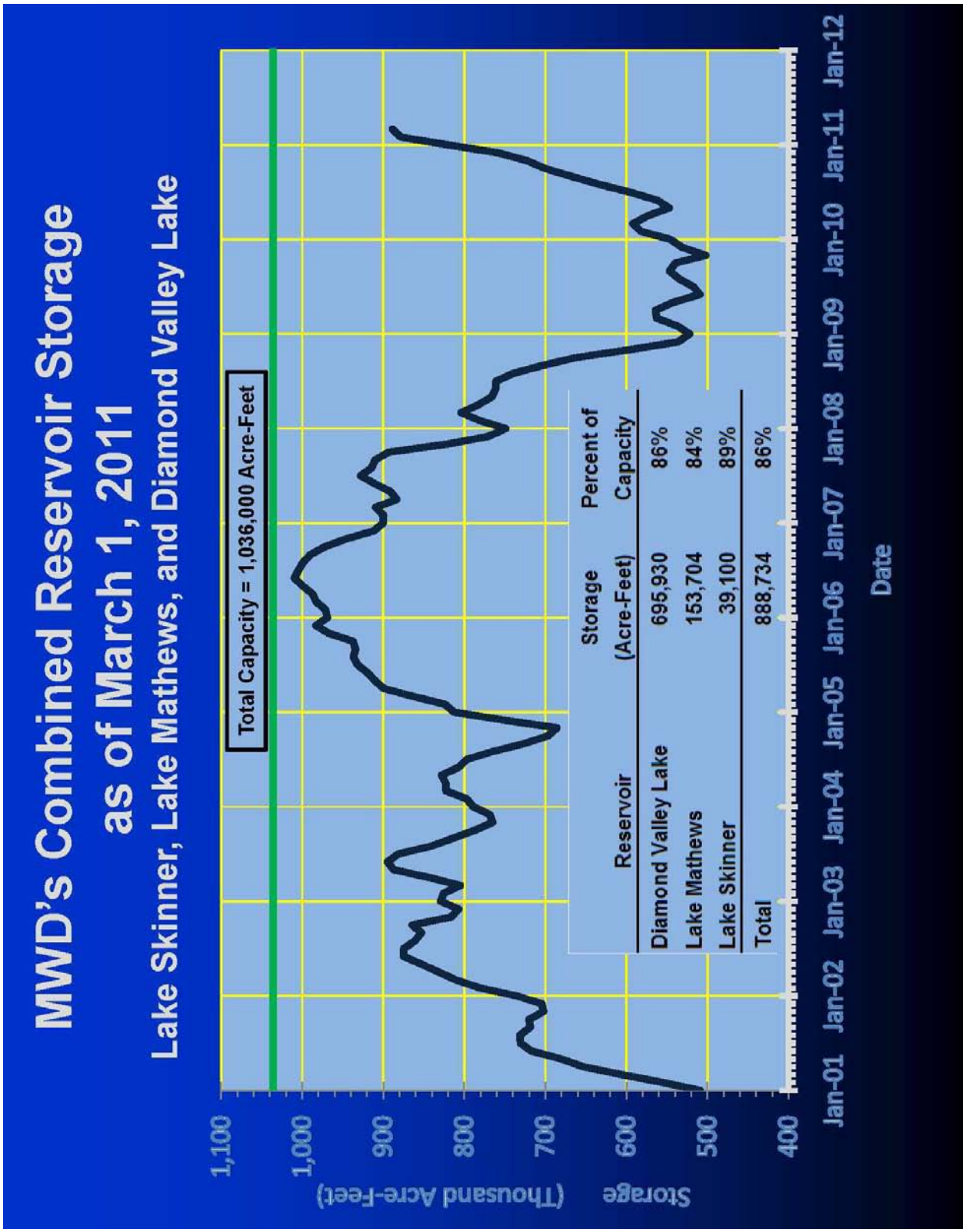

Figure 5.5: MWD Reservoir Levels

5.4 SUPPLY VS. DEMAND

As the City obtains its water sources from local groundwater, imported water, and recycled water, 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. MWD's reliability of supply has direct impact on the City. Population growth will also continue to be a factor in future reliability projections. Since the City is pursuing 100% local groundwater sustainability, 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 RUWMP (see Appendix G) 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 115 GPCD in accordance with SBx7-7 requirements. **Table 5.1** contains the projected populations that will be used to project demand:

Table 5.1
City of Lomita
Service Area Population Projections

Year	Population
2015	20,463
2020	20,975
2025	21,499
2030	22,037
2035	22,588
Demand = Population x GPCD Rate	

During times of drought, demand will increase at a time when supply will decrease. To project demands during drought periods, the following factors measured from actual demand data from 2002-2004 will be assumed:

- **Single Dry Year Demand Increase**: 101.0% of Normal
- **Multiple Dry Year Demand Increases (Years 1, 2, & 3)**: 101.0%, 100.3%, 103.2% of Normal

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						
A	Projected Supply During an Average Year[1]	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
B	Projected Supply During a Single Dry Year[1]	2,.457,000	2,782,000	2,977,000	2,823,000	2,690,000
C = B/A	Projected Supply During a Single Dry Year as a % of Average Supply	**70.5%**	**73.0%**	**72.8%**	**71.5%**	**70.5%**
Demand Information						
D	Projected Demand During an Average Year	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
E	Projected Demand During a Single Dry Year	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						
G = A-D	Projected Surplus During an Average Year	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	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						
A	Projected Supply During an Average Year[1]	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
B	Projected Supply During Multiple Dry Year Period*	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						
D	Projected Demand During an Average Year	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
E	Projected Demand During Multiple Dry Year Period[2]	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						
G = A-D	Projected Surplus During an Average Year	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	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 Lomita Water Supply Availability & Demand Projections
Normal Water Year

Water Sources	2015	2020	2025	2030	2035
Available Supply					
Imported Water	2,230	2,661	2,920	2,863	2,821
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**3,582**	**4,013**	**4,272**	**4,215**	**4,173**
% of Normal Year	100%	100%	100%	100%	100%
Demand					
Imported Water	1,284	1,350	1,417	1,487	1,558
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,636**	**2,702**	**2,769**	**2,839**	**2,910**
% of 2005-2009 Avg. Demand (6,151)	103.3%	105.8%	108.5%	111.2%	114.0%
Supply/Demand Comparison					
Supply/ Demand Difference	946	1,311	1,502	1,377	1,263
Difference as % of Supply	26.42%	32.67%	35.17%	32.66%	30.27%
Difference as % of Demand	35.90%	48.51%	54.25%	48.50%	43.42%

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

1. Total Demand based on 115 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 City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

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

Water Sources	2015	2020	2025	2030	2035
Available Supply					
Imported Water	1,483	1,772	1,955	1,897	1,841
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**2,835**	**3,124**	**3,307**	**3,249**	**3,193**
Normal Year Supply	3,582	4,013	4,272	4,215	4,173
% of Normal Year	79%	78%	77%	77%	77%
Demand					
Imported Water	1,310	1,377	1,445	1,515	1,587
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,662**	**2,729**	**2,797**	**2,867**	**2,939**
Normal Year Demand	2,636	2,702	2,769	2,839	2,910
% of Normal Year	101%	101%	101%	101%	101%
Supply/Demand Comparison					
Supply/Demand Difference	173	395	510	382	254
Difference as % of Supply	6.10%	12.65%	15.42%	11.75%	7.95%
Difference as % of Demand	6.50%	14.48%	18.24%	13.32%	8.64%

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

1. Total Demand based on 115 GPCD (SBx7-7) multiplied by population projections and a single dry-year increase of 101.0% of Normal Year Demand

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

3. Groundwater Supply/Demand based on City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

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

Water Sources	2011	2012	2013	2014	2015
Available Supply					
	Normal Years		**Multiple Dry Years**		
Imported Water	2,141	2,163	1,291	1,286	1,375
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**3,493**	**3,515**	**2,643**	**2,638**	**2,727**
Normal Year Supply	3,493	3,515	3,538	3,561	3,582
% of Normal Year	100%	100%	75%	74%	76%
Demand					
	Normal Years		**Multiple Dry Years**		
Imported Water	1,233	1,245	1,285	1,279	1,368
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,585**	**2,597**	**2,637**	**2,631**	**2,720**
Normal Year Demand	2,585	2,597	2,610	2,624	2,636
% of Normal Year	100%	100%	101.0%	100.3%	103.2%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	908	918	6	6	7
Difference as % of Supply	26.01%	26.11%	0.24%	0.24%	0.25%
Difference as % of Demand	35.15%	35.34%	0.24%	0.24%	0.25%

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

1. Total Demand based on 115 GPCD (SBx7-7) multiplied by population projections and multiple dry-year increases of 101.0%, 100.3%, and 103.2% of Normal Year Demand

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

3. Groundwater Supply/Demand based on City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

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

Water Sources	2016	2017	2018	2019	2020
Available Supply					
	Normal Years		**Multiple Dry Years**		
Imported Water	2,557	2,583	1,492	1,486	1,587
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**3,909**	**3,935**	**2,844**	**2,838**	**2,939**
Normal Year Supply	3,909	3,935	3,961	3,987	4,013
% of Normal Year	100%	100%	72%	71%	73%
Demand					
	Normal Years		**Multiple Dry Years**		
Imported Water	1,297	1,310	1,350	1,345	1,436
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,649**	**2,662**	**2,702**	**2,697**	**2,788**
Normal Year Demand	2,649	2,662	2,676	2,689	2,702
% of Normal Year	100%	100%	101.0%	100.3%	103.2%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	1,260	1,272	142	141	151
Difference as % of Supply	32.22%	32.34%	4.99%	4.98%	5.13%
Difference as % of Demand	47.54%	47.79%	5.25%	5.24%	5.41%

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

1. Total Demand based on 115 GPCD (SBx7-7) multiplied by population projections and multiple dry-year increases of 101.0%, 100.3%, and 103.2% of Normal Year Demand

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

3. Groundwater Supply/Demand based on City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

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

Water Sources	2021	2022	2023	2024	2025
Available Supply					
	Normal Years		**Multiple Dry Years**		
Imported Water	2,809	2,837	1,566	1,560	1,663
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**4,161**	**4,189**	**2,918**	**2,912**	**3,015**
Normal Year Supply	4,161	4,189	4,217	4,245	4,272
% of Normal Year	100%	100%	69%	69%	71%
Demand					
	Normal Years		**Multiple Dry Years**		
Imported Water	1,363	1,377	1,418	1,413	1,506
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,715**	**2,729**	**2,770**	**2,765**	**2,858**
Normal Year Demand	2,715	2,729	2,743	2,756	2,769
% of Normal Year	100%	100%	101.0%	100.3%	103.2%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	1,445	1,460	147	147	157
Difference as % of Supply	34.74%	34.85%	5.05%	5.05%	5.20%
Difference as % of Demand	53.22%	53.49%	5.32%	5.31%	5.48%

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

1. Total Demand based on 115 GPCD (SBx7-7) multiplied by population projections and multiple dry-year increases of 101.0%, 100.3%, and 103.2% of Normal Year Demand

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

3. Groundwater Supply/Demand based on City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

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

Water Sources	2026	2027	2028	2029	2030
Available Supply					
	Normal Years		**Multiple Dry Years**		
Imported Water	2,757	2,783	1,563	1,557	1,658
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**4,109**	**4,135**	**2,915**	**2,909**	**3,010**
Normal Year Supply	4,109	4,329	4,358	4,387	4,415
% of Normal Year	100%	100%	67%	66%	68%
Demand					
	Normal Years		**Multiple Dry Years**		
Imported Water	1,431	1,445	1,487	1,482	1,578
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,783**	**2,797**	**2,839**	**2,834**	**2,930**
Normal Year Demand	2,783	2,797	2,811	2,825	2,839
% of Normal Year	100%	100%	101.0%	100.3%	103.2%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	1,325	1,338	76	76	80
Difference as % of Supply	32.26%	32.36%	2.60%	2.60%	2.67%
Difference as % of Demand	47.62%	47.84%	2.67%	2.67%	2.75%

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

1. Total Demand based on 115 GPCD (SBx7-7) multiplied by population projections and multiple dry-year increases of 101.0%, 100.3%, and 103.2% of Normal Year Demand

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

3. Groundwater Supply/Demand based on City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

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

Water Sources	2031	2032	2033	2034	2035
Available Supply					
	Normal Years		**Multiple Dry Years**		
Imported Water	2,718	2,744	1,569	1,563	1,662
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Supply	**4,070**	**4,096**	**2,921**	**2,915**	**3,014**
Normal Year Supply	4,070	4,096	4,122	4,148	4,173
% of Normal Year	100%	100%	71%	70%	72%
Demand					
	Normal Years		**Multiple Dry Years**		
Imported Water	1,501	1,515	1,558	1,553	1,651
Groundwater	1,352	1,352	1,352	1,352	1,352
Total Demand	**2,853**	**2,867**	**2,910**	**2,905**	**3,003**
Normal Year Demand	2,853	2,867	2,882	2,896	2,910
% of Normal Year	100%	100%	101.0%	100.3%	103.2%
Supply/Demand Comparison					
	Normal Years		**Multiple Dry Years**		
Supply/Demand Difference	1,217	1,229	11	11	12
Difference as % of Supply	29.91%	30.00%	0.37%	0.37%	0.38%
Difference as % of Demand	42.67%	42.86%	0.37%	0.37%	0.38%

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

1. Total Demand based on 115 GPCD (SBx7-7) multiplied by population projections and multiple dry-year increases of 101.0%, 100.3%, and 103.2% of Normal Year Demand

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

3. Groundwater Supply/Demand based on City's adjudicated right of 1,352 AFY

*This Table not intended to be a projection of City's actual groundwater production. City may pump amounts different from its adjudicated right of 1,352 AFY based on leases to or from other agencies.

*This Table is not intended to be a projection of City's actual demand. Demand of 115 GPCD is a conservative estimate based on SBx7-7 limits. Actual demand is likely to be below the SBx7-7 limit of 115 GPCD in accordance with water efficiency trends in the City.

Based on the data contained in **Tables 5.4-5.10**, the City can expect to meet future demands through 2035 for all climatologic classifications. Projected groundwater 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

Due to the semi-arid nature of the City's climate and as a result of past drought conditions, the City is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. 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 Water Conservation Plan (Ordinance 479) along with implementation of the appropriate stage of regional plans such as the WSDM Plan (MWD). 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. Once the City brings Well No. 5 into daily operation, the City will identify specific means of achieving their sustainability goals from local sources which will likely include additional wells, alternative water supply projects, and the leasing of additional groundwater rights to meet demand. The City does not have any formal plans for water supply projects at the current time other than upgrades to its distribution infrastructure in order to ensure a reliable supply and to prevent system losses.

Regional Projects (MWD)

MWD is implementing water supply alternative strategies for the region and on behalf of member agencies 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** below:

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**.	

This Page Left Blank Intentionally

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 BMPs

Although the City is not a signatory to the MOU, West Basin (WBMWD) is, and implements many of the BMPs on behalf of its member agencies, including the City of Lomita. As a result, the City either directly or indirectly implements 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

The City has continued to work with WBMWD towards implementing the 14 BMPs, which are incorporated in the regional water agencies rate surcharges In accordance with the UWMP Act, the 14 DMMs are abbreviated as follows:

1. Water Survey Programs
2. Residential Plumbing Retrofit
3. Water Audits/Leak Detection
4. Metering with Commodity Rates
5. Large Landscape Conservation
6. H-E Washing Machine Rebates
7. Public Information Programs
8. School Education Programs
9. Commercial/Industrial Conservation
10. Wholesale Agency Programs
11. Conservation Pricing
12. Water Conservation Coordinator
13. Water Waste Prohibition
14. Ultra-Low-Flush Toilet Replacement

The City's commitment to these measures is described in **Table 6-1** as follows:

Table 6.1
Summary of Demand Management Measures
(CUWCC Best Management Practices)

Demand Management Measure		Description
DMM No. 1: Water Survey Programs for Single and Multi-Family Residential Customers		WBMWD & 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		WBMWD & 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 WBMWD's service area to achieve landscape water use efficiency.
DMM No. 6: High-Efficiency Washing Machine Rebate Programs		Through this program, WBMWD's & the City's customers can receive a rebate towards the purchase of a high-efficiency washing machine.
DMM No. 7: Public Information Programs		These programs provides the public information to promote water conservation and water conservation-related benefits.

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

Demand Management Measure		Description
DMM No. 8: School Education Programs		The City partners with WBMWD to provide children an opportunity learn the importance of water conservation
DMM No. 9: Conservation Programs for Comm./Indust./Institutional Accounts		Through this program, WBMWD & the City assists water using establishments in upgrading their plumbing devices.
DMM No. 10: Wholesale Agency Programs		Through this program, WBMWD provides the City with resources to advance water conservation efforts and effectiveness
DMM No. 11: Conservation Pricing		Through this program, WBMWD & 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, WBMWD & the City assists customers in replacing their existing toilets with water efficient models.

6.3 CITY CONSERVATION POLICIES

As a member of WBMWD, the City of Lomita benefits from regional DMM programs performed by WBMWD on behalf of its member agencies. Current WBMWD conservation programs are saving over 4.5 billion gallons of imported water every year, since the 1990's. These savings relate directly to additional available water for beneficial use within the WBMWD service area, including the City of Lomita. This section presents a description of the DMM activities implemented in coordination with WBMWD and the City including regional and local programs, which benefit the City:

DMM No. 1: Residential Surveys

On behalf of its member agencies, WBMWD acts as the liaison to MWD to offer funding for residential survey devices. As a member agency of WBMWD, the City may receive funding through MWD.

The City also responds to customer inquiries to high water bills that prompt informal water surveys to be completed by trained City water staff. A high water bill triggers the City to inspect the accuracy of the water meter, conduct a flow test, and then suggest possible sources of water leaks or excessive water use. The City initiated water surveys in 1992, following the City's acquisition of the water system from Los Angeles County.

Based on the CUWCC's savings rates, set forth in the BMP Costs & Savings Study, savings from untargeted intensive home surveys results in an average of 21 gallons per day (gpd) per household (both single family and multi-family) total savings for future projections. This rate allows the calculation of estimated total water savings that results from completion of residential water surveys. For the City, 21 gallons per household returns significant returns as the City is one of the most water efficient cities of WBMWD (under 100 GPCD).

Figure 6.2: Residential Water Survey

The City will measure the effectiveness of water survey programs through analyzing the number of surveys distributed and the difference in water consumption for the families after the surveys are conducted.

DMM No. 2: Residential Plumbing Retrofit

On behalf of the City, WBMWD actively distributes faucet aerators and low-flow showerheads within its service area. Since 1990, WBMWD has installed numerous faucet aerators and low-flow showerheads.

Figure 6.3: Low-Flow Showerhead

WBMWD plans on continuing to provide ULFTs and rebates as long as funding is available, programs continue to be cost-

effective, and a significant saturation level has not been met. Due to the large areas of high density and numerous multi- family facilities, there are still many older toilets that need replacing. WBMWD will continue to partner with cities and water purveyors in order to implement these programs. In addition, WBMWD will continue to offer a $50 rebate for the purchase and installation of ULFTs.

The method to evaluate effectiveness consists of calculating estimated water savings for each BMP and comparing historic water demand with the current water demand and noting if a savings quantity is apparent.

DMM No. 3: Leak Detection & Repair

The City's surveillance of its water system to detect leaks is an on-going operation. The City recognizes the urgency of repairing leaks and responds to any leak in an expedient manner. Field employees are trained in detection of leaks and signs of unauthorized uses of water. In addition, the customer billing system flags high or unusual water bills, which are then investigated for possible leaks in customer piping. When a leak is first noticed, the pipeline is inspected and promptly repaired. Leak detection and repair activities were first initiated in 1992 when the City acquired the water system from Los Angeles County. The City's system inspection and field reviews are triggered when pressure losses are experienced within the same locations of the distribution line.

In 1996, WBMWD and its sister agency, Central Basin Municipal Water District (CBMWD), partnered with the United States Bureau of Reclamation (USBR) and hired a consultant to develop and provide a Water Audit and Leak Detection Program (Program). The Program was offered to 40 water purveyors. Of the 40 purveyors, 10 participated in the audit, and of the 10, three agencies found their unaccounted-for water to be above 10%.

Figure 6.4: Leak Detection

To evaluate the effectiveness of these conservation measures, staff will review the data records to confirm that the unaccounted-for water losses remain low and consistent. Because of the City's proactive measures, the unaccounted-for water losses are 7%. The CUWCC has established a standard rate of water savings based on the repair of a distribution line: a 1-inch crack in a distribution main at 100 psi can leak 57 gpm. Cost and savings depend on the age of infrastructure for the water system.

DMM No. 4: Metering With Commodity Rates

The City bills its customers according to meter consumption. In addition, the City encourages the installation of dedicated landscape meters, which allows the City to recommend the appropriate irrigation schedules through future landscape programs. Meter calibration and periodic replacement insures that customers are paying for all of the water they consume,

and therefore encourages conservation.

Metering allows the City to conserve a total of 20-30 percent of the water demand overall, and up to 40 percent savings during peak demand periods, as estimated by the CUWCC's BMP Costs and Savings Study. The measure of effectiveness will include a comparison of water use before and after meter calibration.

Figure 6.5: Water Meter

DMM No. 5: Large Landscape Programs

In Southern California, over 50% of water is used for outdoor landscape irrigation. Therefore, in order to conserve water consumption throughout its service area, including the City of Lomita, WBMWD is actively developing conservation programs targeting the larger outdoor irrigation systems. WBMWD will continue to seek partnerships and resources in order to offer new programs targeted at large landscape customers. The following described the variety programs WBMWD is implementing on behalf of its member agencies.

Irrigation Controller Program

In 2004, MWD was awarded a Proposition 13 grant for a new Weather- Based Irrigation Controller Program. WBMWD has been working with the Project Advisory Committee (PAC) to develop the program. WBMWD recognizes the water savings potential and is beginning to test weather-based irrigation controllers in sites that use potable imported water. The plan is to use the new controllers in areas where recycled water is unavailable. The funding incentives provided vary based on the number of stations and acreage at each site. The funding is used to help pay for the hardware and to help motivate cities, parks, and schools to participate in the program.


Figure 6.6: Outdoor irrigation

Protector Del Aqua Irrigation Program

WBMWD also partners with MWD Water District on the "Protector Del Agua" or "Protector of Water" landscape classes. In partnership with cities, classes are offered to residents as a way to teach them about various topics that help conserve water and reduce urban runoff. Residents learn about gardening with native plants and using weather-based irrigation controllers to conserve water and reduce runoff.

Since fifty percent of the potable water in southern California is used for maintaining landscaping, offering these classes is an ideal way to reduce outdoor water use and substantially reduce outdoor water waste. By educating the public regarding proper methods of maintaining their irrigation

systems, methods of trouble shooting irrigation system problems, such as over-watering, that are simple yet difficult to address, can be solved without spending additional funding.

Ocean Friendly Gardens

In 2005, WBMWD formed a partnership with the Surfrider Foundation to develop "Ocean Friendly Garden" workshops and demonstration gardens. WBMWD took the lead in applying for a State grant to help finance the classes. The classes focus on planting "ocean friendly plants" and installing weather-based irrigation controllers as a way to reduce urban runoff that finds its way to the local waterways and the ocean. The installation of water efficient plants and efficient sprinkler controllers can conserve between 20%-50% water and reduce runoff by up to 70%.

These programs are offered to customers throughout the City's service area, since it is included within WBMWD's service area. The measure of effectiveness for the City in implementing this BMP will consist of the amount of increase in class participation. The City will continue encouraging customer participation in these programs through 2015.

DMM No. 6: HE Washing Machines

The City promotes HEWMs through consumer education and incentives. In 2003, the City, through the WBMWD HEWM Rebate Program, distributed a total of 15 washer rebates. Since then, participation in the program significantly increased, with 44 washer rebates provided throughout its service area. In the past few years, over seven rebates were provided and it is anticipated this number will increase based on significant past participation in the program. The program is significant for the City's service area and will be continued as long as the demand for HE washing machines is present.

Figure 6.7: HE Washing Machines

The method to measure effectiveness of this BMP will include quantifying the number of HECW's distributed and the total potential water savings, and then analyzing the water demand after one year of implementation to observe how the water demand changed.

DMM No. 7: Public Information Programs

The City regularly holds public meetings that provide its customers with an opportunity to ask questions about the water source, supply, rates, and other water system related concerns. In addition, two types of informational brochures are distributed to its customers: 1) basic source, supply and meter information, and 2) water treatment and conservation measures.

WBMWD, along with the City of Lomita and other local agencies, implement the following programs and activities to promote water conservation:

Public Information Committee (PIC)

The Public Information Committee consists of Public Information and Public Affairs Officers from member agencies. The PIC

provides useful information to customers on important water issues.

Inspection Tours

WBMWD, in coordination with MWD, provides inspection tours of the CRA and the SWP to legislators, local elected officials, retail agency staff, and the general public. The purpose of the tours is to enhance the understanding of water supply.

Speaker's Bureau

WBMWD provides speakers to local community groups, service clubs, and schools upon request.

Water Harvest Festival

WBMWD invites parents and children to participate in a variety of water education games and to obtain information on water recycling and conservation.

California Water Awareness Campaign

An association formed to coordinate efforts throughout the state during Water Awareness Month, and throughout the year.

The method to measure effectiveness of implementing this BMP for the City is to quantify the number of participants in the public programs, as well as the number of public announcements and/or brochures distributed throughout the service area. An increase in participation and distribution of materials will indicate heightened public water conservation awareness and may correlate with decrease water demand

DMM No 8: School Education Programs

The City provides school education programs to grades 6 through 8 on water awareness and conservation. The City will continue to promote and coordinate water education school programs with the schools.

In addition, WBMWD promotes educational programs about water conservation to elementary through high school students. The City participates in the Planet Protector Water Explorations program, reaching grades 6-8. The *Planet Protector Water Explorations* is a collaborative water education field trip program between WBMWD and the Roundhouse Marine Research Station and Aquarium in Manhattan Beach. The Roundhouse is operated by Oceanographic Teaching Stations, a non-profit organization, and is affiliated with the Los Angeles County Office of Education.

Figure 6.8: West Basin's School Programs

The objectives of Planet Protector Water Explorations are:

1. To increase the awareness of water as a valuable and limited resource.
2. To encourage water conservation efforts.
3. To introduce the concept of water recycling.
4. To introduce the concept of ocean water desalination.
5. To increase the awareness of urban runoff pollution.

6. To teach about local marine life.
7. To promote the concept of stewardship of the environment and its resources.

Over 25,000 students experienced *Planet Protector Water Explorations*, since the program began in September 1995. In addition, WBMWD has implemented the following programs for the benefit of its member agencies, including the City:

Think Earth It's Magic

Through West Basin's membership as part of the Think Earth Environmental Education Foundation, *Think Earth It's Magic* is a collaborative program between West Basin, Los Angeles County Sanitation Districts, and MWD. *Think Earth It's Magic* combines Think Earth's award winning environmental education curriculum, which is designed to promote conservation behaviors and stewardship of the environment, with an environmental magic show that cleverly ties together what students learn in the classroom.

Conservation Connection

This purpose of this program is to educate students regarding the connection between California water and energy supply, and human consumption. The goal of the curriculum is to get students actively involved, in their homes, and at school, in conserving water and energy.

To initiate the program, students survey their family's water and energy use, as well as water and energy use at their school. After the data is gathered, the students analyze their findings, and make recommendations. Then, students implement, and monitor efforts to decrease water and energy use. By participating in this action-based curriculum, students learn to look critically at important environmental issues and take responsibility for finding solutions.

Think Earth Curriculum Kits

Through West Basin's membership as part of the Think Earth Environmental Education Foundation, all teachers that participate in *Planet Protector Water Explorations* receive a grade appropriate *Think Earth* curriculum unit. *Think Earth* units are usually distributed each March, so that teachers have them prior to Earth Day in April. Each *Think Earth* unit contains a video, two color posters, a teacher's guide, and student booklets. The entire *Think Earth* curriculum is correlated to the California State Content Standards for the following content areas: Language Arts, Science, Social Science, and Mathematics.

Over the past ten years, over 25,000 students within West Basin's service area have participated in *Think Earth*.

Water Awareness Month Poster Contest

WBMWD's Water Awareness Month Poster Contest is also offered to all residents throughout its service area. All teachers who have or will participate in *Planet Protector Water Explorations* are notified each February, which provides enough time to allow students to participate in the "Water Is Life" Poster Contest, which is sponsored by West Basin and MWD each May. In addition, all teachers at each of West Basin's primary and secondary schools will also be notified in February. As in previous years, one grand-prize winner is selected from each School District and receives a fully-loaded laptop computer during an award ceremony in June.

Water Wanderings

Water Wonderings is a collaborative classroom visitation program between West Basin and the S.E.A. Lab in Redondo Beach. This collaborative hands-on classroom program takes fourth graders on a 2 ½-hour journey through California's water. The program will be correlated to many of the fourth grade State standards for social science and science. Included in the program will also be a "touring tide pool," a van outfitted with touch tanks that will enable students to touch live marine creatures and plants.

Sewer Science

WBMWD staff is partnering with the LA County Sanitation Districts on this exciting high school science program. *Sewer Science* is a hands-on laboratory program that teaches students about wastewater treatment. During a week-long lab, students create wastewater; treat it through the use of tanks employing physical, biological, and chemical methods; and apply analytical procedures to test its quality. *Sewer Science* is correlated to the California State Content Standards for chemistry, physics, and microbiology.

DMM No. 9: Commercial, Industrial, Institutional Programs

WBMWD, in partnership with MWD, participates in MWD's region-wide CII rebate program. WBMWD offers the rebates to its member agencies, including the City. Rebates are offered for commercial clothes washers water brooms, cooling tower conductivity controllers, pre-rinse spray nozzles, x-ray machine recirculating devices and commercial toilets and urinals.

In 2002, the CUWCC pursued and received a $2.3 million grant from the California Public Utilities Commission to purchase and install restaurant pre-rinse spray nozzle valves. The new nozzles use 1.6 gpm compared to 2 to 6 gpm valves. These valves conserve water, heating costs, and reduce waste-water discharge. West Basin supported CUWCC's efforts in marketing the program. The nozzles and installations were provided free of charge to the food services sector.

In 2005, WBMWD entered into a 10-year agreement with MWD to help support the on-going regional marketing efforts of the CII rebate program. As a way to increase the success of this program, WBMWD offers its cities and water purveyors with partnering opportunities to increase the rebate amounts. Over the years, agencies have partnered to provide higher rebate incentives in an effort to increase program participation of their customers.

As a result of these efforts, the City provides the opportunity for rebates to its customers in the commercial, industrial and institutional sectors. Over the past ten years, many rebates for clothes washers, water brooms, ULFTs, and efficient urinals have been distributed.

Figure 6.9: Zero-Water Urinals

The implementation of these conservation programs provide a cumulative savings of

3.7 AFY. The predominance of customers utilizing the rebate programs includes schools and apartment buildings. In 2005, the City initiated its Rinse and Save Program for CII customers. Through this program, the City provides pre-rinse spray valves to customers to install.

The CII Rebate Program provides a total of 17.8-20.3 percent median and 17.9-29.2 percent mean in savings on an annual basis. To measure the effectiveness of this BMP, the City performs a water savings analysis by calculating the total number of rebates distributed and the estimated water savings for each. The total of this calculation will show the amount of water saved and should be reflected in the overall water use before and after implementation of the BMP.

DMM No. 10: Wholesale Agency Programs

The City takes advantage of WBMWD's conservation-related technical support and information it offers to its member agencies. Programs include ULFT replacement, system audits, HEWM rebates, public information, school education, wholesaler incentives, residential retrofits, CII rebates and surveys, residential and large turf irrigation, and assistance with conservation related rates and pricing. Overall, WBMWD offers programs under BMP's 3, 5, 6, 7, 8, 9, 10, 12, and 14 on behalf of its member agencies, including the City.

DMM No. 11: Conservation Pricing and Billing Procedures

In 2003, WBMWD passed-through MWD's two-tiered rate structure to its member agencies to develop a reasonable budget for the Tier 1 annual maximum limit for imported water. Through voluntary purchase agreements, these customers will pay a higher price (Tier 2) for purchases that exceed their Tier 1 allotment. In an effort with other agencies, WBMWD helps prevent member agencies, including the City, from exceeding their Tier 1 allocation limits by conservation, education, and the development of recycled water use.

In response to this two-tiered structure, the City implemented a new rate structure as part of the Water Rate Analysis report completed in 2004. The City's customer growth projection of approximately 1 percent new water connections over 5 years required that the proposed water rates be organized utilizing an increasing block method. With this approach, the unit price of water increase with each successive block, resulting in an increase in the incremental and the average cost of water with increased water use. The new rate structure encourages water conservation.

The measure of effectiveness of the rate structure in terms of acting as a catalyst for water conservation will be assessed based on decreases in the total amount of consumption since the charges are based on total consumption rates.

DMM No. 12: Conservation Coordinator

The City's Field Operations Manager serves as the City's Conservation Coordinator for the water service area. The role of the Field Operations Manager entails consistent water, street, and tree code enforcement and as a result, regular communication with customers is provided. Since 1992, the responsibilities of the Field Operations Manager have included the conservation coordinator duties. The costs associated with this position are approximately $2,700 per month.

Additionally, WBMWD has an assigned a Conservation Coordinator to work with its member agencies, including the City, to enhance their conservation efforts. WBMWD's Conservation Coordinator also investigates Federal, State, and local funding to develop new programs throughout its service area.

DMM No. 13: Water Waste Prohibition

Under City Ordinance No. 481 (Section 1, 6-17-91), "no customer of the City water department shall make, cause, use, or permit the use of water from the city water department in a manner contrary to any provision of Municipal Code Section 12-4-01 through 12-4.18." Additionally, WBMWD supports member agencies and local cities to adopt ordinances that will reduce wasting water.

Figure 6.10: Water Waste

Additionally, WBMWD supports member agencies and local cities to adopt ordinances that will reduce wasting water.

DMM No. 14: Ultra-Low-Flush Toilet Replacement Program

In partnership with WBMWD, the City has aggressively promoted the replacement of high water using toilets, which has resulted in the distribution of over 700 ULFTs since 2001 in its service area.

From 2000, ULFTs rebates have been provided to single family and multi-family homes. The City continues to be dedicated to ULFT replacements as an aggressive conservation measure.

Figure 6.11: Ultra-Low-Flush Toilet

In 1991, WBMWD introduced its ULFT program, which includes direct installation and rebates based on available funding. WBMWD has also partnered with MWD on a joint-project to identify areas within its service area where the devices could be implemented.

Due to the large areas of high density and numerous multi-family facilities, WBMWD will continue to partner with cities and member agencies to offer a $50 rebate for the purchase and installation of ULFTs. WBMWD also provides a $70 rebate for the purchase and installation of dual-flush toilets, which have the ability to flush at 0.8 of a gallon for liquids and 1.6 gallons for solids.

6.4 ADDITIONAL CONSERVATION

WBMWD has developed new conservation programs in partnership with MWD in order to conserve additional water throughout its service area. These programs include the Synthetic Turf Program, California Heritage Program, and the Community Partnering Program.

WBMWD has also proposed the Restroom Retrofit Project, which will offer 91 AFY in water savings. The Project is proposed for funding under the DWR Water Use Efficiency Grant Program. The Project will furnish restroom maintenance for up to 383 restrooms in one year.

In addition, MWD proposed four water conservation programs for funding under the DWR Water Use Efficiency Grant Program. The programs and the status of funding are listed as follows:

Residential High Efficiency Clothes Washer Rebate Program

The Residential High Efficiency Clothes Washer Rebate Program offers rebates toward the purchase of water- and energy-saving clothes washing machines, which will reduce the demand on water imported from the Bay Delta by 12,275 AFY. This 2- year program was funded at $1.66 million.

California Friendly Communities

The program will result in CALFED Benefits, which include avoiding Bay Delta diversions. California Friendly Communities is a grant program in which cities receive funding to transform their landscape to increase water conservation. A maintenance plan enhanced irrigation and controllers, and landscaping techniques are exercised through this program. This program received $424,150 in funding for 1,650 valves for multi-family residences.

High-Efficiency Toilet Rebate Program

A rebate is given to customers who purchase a new High Efficiency Toilet. The toilet uses a minimum of 20% less water than standard toilets and will supply 41 AFY of water savings. This program was funded at $1.0 million for a total of 10,000 ULFTs.

Online/Web-Based Irrigation Efficiency Training

This program will provide two class courses for residential and professional participants, as well as educate individuals about water use, efficiency training, and educational programs. DWR funded one residential series class and two classes from the professional course for a total of $77,500.

6.5 COORDINATION

The City works closely with WBMWD to understand the economics of water conservation programs through the adoption and application of the MWD-Main Model. The Model forecasts water demands on both a regional basis and at the retail level to produce an estimate of future water demand, the identification of potential benefits, and costs associated with implementation of the BMPs. The conservation potential by retail water agency is used to develop BMP implementation plans using a “least cost approach” to develop a “most cost effective” package of BMP programs customized for each retail agency. A Conservation Savings Model estimates the potential water conservation from implementation of the BMPs. Once the potential water savings are quantified, programs can be developed to target potential savings. From this model, implementation plans will be developed for the City, in coordination with the City, by WBMWD, detailing the most cost-effective BMPs.

Quantifiable BMP programs include ULF toilet and low-flow showerhead retrofits, water audits and conservation pricing. Programs and activities that are not quantifiable, but known to save water, include public information, school education, conservation coordinator, water waste prohibitions, and metering with commodity rates.

Water use efficiency is an integral part of water supply planning and operations. The City works to improve the understanding of costs and benefits of conservation so that investment decisions are efficient and effective at meeting program goals. As a cooperative member of California's conservation community, the City supports WBMWD's significant contributions to the development and coordination of water use efficiency activities for its member agencies.

Many of the BMPs have been implemented on a regional basis based upon the WBMWD's MOU schedule, others are being implemented, and all BMPs will continue on an ongoing basis. The City will continue to work cooperatively with WBMWD to implement cost-effective BMPs.

SECTION 7: CONTINGENCY PLANNING

7.1 INTRODUCTION

Water supplies may be interrupted or reduced significantly in a number of ways including droughts, earthquakes, and power outages which can hinder a water agencies ability to effectively delivery water. Drought impacts increase with the length of a drought, as carry-over 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. 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 a "Phased Water Conservation Plan", which was adopted as Section 12-4 in the City's Municipal Code. The purpose of the plan is to reduce the effect of shortage water supplies on the City's customers during water shortage emergencies. In compliance with the Water Code requirements, this plan imposes a 50 percent reduction in the total water supply. The City will also coordinate with WBMWD to implement water shortage plans on a regional level.

7.2 CITY RESPONSE PLAN

The City has implemented a water conservation program to reduce water demands since the drought period of the early 1990s. The "Phased Water Conservation Plan" was adopted as Section 12-4 of the City's Municipal Code to implement a 9-stage phased approach to reduce water usage to meet anticipated shortage in water supply. In the event of a water shortage, the City Council will implement the appropriate water conservation phase by resolution.

The objectives of the 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 for use of available water are listed in order 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

Stages of Action

During water shortages, the City has the ability to meet its demands by applying a Phased Water Conservation Plan. This plan imposes phases of voluntary and mandatory water reduction of water use up to 50 percent and consists of nine phases that help reduce water use within the City's system in order to meet a water supply reduction target based on the severity of the drought conditions or supply shortage.

Table 7.1
Water Shortage Reduction Targets

Shortage Phase	Restriction Type	Water Supply Reduction Target
I	Voluntary	10%
II	Voluntary	15%
III	Voluntary	20%
IV	Voluntary	25%
V	Mandatory	30%
VI	Mandatory	35%
VII	Mandatory	40%
VIII	Mandatory	45%
IX	Mandatory	50%

The City of Lomita's City Council will implement the provisions of the Phased Water Conservation Plan, following a public hearing, upon determination that the projected water shortage and the appropriate measures should be implemented. Any provision requiring curtailment in the use of water shall become effective no sooner than the first billing period commencing on or after the date of publication of the measures adopted. **Table 7.1** indicates the restriction type and the water supply reduction in percent of average water use with respect to the various shortage stages as included in Section 12-4 of the City's Municipal Code, which is also included in Appendix G.

The type of event which may prompt the City Council to declare a water shortage and implement the Water Conservation Plan includes a drought, a state or local emergency, a natural disaster that critically impacts the supply or water conveyance system, a localized event that critically impacts the water supply. The water supply can be impacted due to deficient water treatment and/or water quality, and problems with storage, transmission, or the water distribution system. Also, restricted use could be triggered by the City's wholesale water agency requesting extraordinary water conservation efforts in order to avoid mandatory water allocations in accordance with the Water Supply Allocation Plan (WSAP).

Since the City is reliant upon imported water, the City will also respond to the actions of WBMWD. WBMWD implements its water shortage contingency plan in coordination with the policy of MWD's Water Surplus and Drought Management (WSDM) Plan. The WSDM Plan defines 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.

MWD WSDM Plan

In addition to the provisions of the City's Conservation Ordinance, the City will also work in conjunction with WBMWD and 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 WSAP.

Figure 7.1: Severe Droughts Highlight the Importance of Conservation Ordinances

7.3 THREE-YEAR MINIMUM SUPPLY

During a three year drought the City may import water to meet demands in excess of its adjudicated pumping right of 1,352 AFY, as 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
Total	2,643	2,638	2,727

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 CASTROPHIC INTERRUPTIONS

A water shortage emergency could be caused by 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 WBMWD and 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's reservoirs, and it is confirmed that the necessary capacity is available to do so.

The City's Standardized Emergency Management System (SEMS) Multi-hazard Functional Plan (MHFP) addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies. Under this Plan, the Operations Section will operate under the following policies during a disaster/emergency as the situation dictates:

- All existing city and departmental operating procedures will be adhered to unless modified by the City Council.
- All on-duty personnel are expected to remain on duty until properly relieved of duty. Off-duty personnel will be expected to return to work in accordance with each respective department's policies and procedures.
- While in a disaster mode, operational periods will normally be 12 hours for the duration of the event. Operational periods will be identified in the Action Plan. Operational periods shall be event driven.

The Operations Section Coordinator for the Water Unit will be assigned by Public Works and will be held responsible for carrying out the following operations:

- Establish liaison with California Water Company.
- Assess impact of incident based on Local Health Department, DHS District Office of Drinking Water, and Utility emergency situation reports and other available information.
- Identify need for and prioritize locations for water distribution (include needs of critical facilities).
- Provide for water quality assurance.
- Evaluate, plan and implement actions to acquire and distribute alternative potable water.

- Determine the need to staff a water task group and secure resources through the Logistics Section.
- If situation requires resources beyond the capability of the EOC, notify the Los Angeles County Operational Area EOC via EMIS (Internet); or if EMIS is not available, then all reports and requests are to be sent to the Lomita Sheriff's Station by means coordinated with and agreed to by the Watch Commander and city staff. The Lomita Sheriff's Station will then be responsible for entering the data into EMIS.
- Provide water utilities in the affected area and the Los Angeles County Operational Area EOC with situation status and information related to actions to provide alternative water supply. Establish/maintain emergency water connections with adjacent water companies.
- Provide information to media as appropriate.

In addition, the City's distribution system has three emergency connections. One connection is with the City of Los Angeles and the other two connections are with the City of Torrance. The City of Los Angeles connection is an 8-inch, two-way connection with a maximum capacity of 1800 gpm. The two connections with the City of Torrance are 8-inch, one-way connections with a maximum capacity of 1350 gpm. These three connections can allow water to flow to the City's water system during emergencies.

The City will also rely on MWD's catastrophic event plan to utilize the Diamond Valley Lake reservoir, which can be filled with double the storage capacity for Southern California and provide six months of emergency supply. If there were a catastrophic failure of the California Aqueduct or the CRA conveyance facilities, MWD could draw on emergency supplies in Diamond Valley Lake.

Figure 7.2: Diamond Valley Lake

In addition, MWD has established an emergency communication system, known as the Member Agency Response System (MARS). MARS is a radio communication system developed by MWD and its member agencies to provide an alternative means of communication in extreme circumstances.

The City will be informed indirectly through the use of MARS in case of a catastrophic event. Locally, WBMWD, as the MWD member agency, will utilize MARS to immediately contact its customer agencies and MWD during an emergency about potential interruption of services. WBMWD is currently in the process of enhancing its communication system in order to provide a more rapid response for the benefit of the City of Lomita and its other member agencies.

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 in times of disasters when danger to life and property exists.

7.5 PROHIBITIONS & PENALTIES

The City implements several measures to curtail water consumption during times of supply shortages. As of March 18, 1991 the City adopted Ordinance No. 479 (Appendix G). Prohibitions pertain to customers or persons who utilize the water utility of the City based on the extent of the water shortage, where mandatory measures are implemented in Phase III through Phase IX. Such prohibited activities are summarized below and include the following:

- Hosing or washing sidewalks, walkways, driveways etc.
- Landscape Watering between the hours 10:00 a.m. and 5:00 p.m.
- Excessive irrigation to the extent to cause run-off into adjacent streets, parking lots or alleys is prohibited.
- Indoor and outdoor Pluming to be inspected and repaired if needed as soon as possible.
- Washing of motor vehicles, boats, trailers or other type of mobile equipment is prohibited except at a commercial car wash, or with reclaimed water, unless such vehicle is washed by using hand-held bucket or water hose equipped with automatic shutoff nozzle.
- Serving drinking water to customers without consent.
- Water used in decorative fountains must flow through a recycling system.
- Use of a hose for car washing, lawn watering, or any other use requiring intermittent water is prohibited, unless an automatic shut off nozzle on the hose used for said purpose.

The City's Water Conservation Plan includes stringent measures to reduce the City's water demand in the short-term ranging from 10 percent during Phase I and up to 50 percent by Phase IX. The stages of action are identified in Table 7.2 Phased Water Conservation Plan Rationing Stages.

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 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

As water consumption decreases, the revenue generated through water sales also decreases. To continue operation, the City will need to generate sufficient revenue when faced with decreasing water sales revenue. Based on the City's total water revenue and operating expenses, demand reductions will result in negative net cash provided by operating activities.

To offset financial loss due to a water shortage, the City will implement the Phased Water Conservation Plan. The City

has prepared stringent measures, as outlined in the plan, to effectively mitigate water supply shortage in the event of a catastrophic event or drought. A reduction in water consumption will likely result in loss of revenues needed to maintain and operate the water system. The following actions will take place 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.

A combination of the measures outlined above may be used to offset or diminish the effects of lost revenues. Capital construction projects may be deferred, as appropriate. The base water rate may be increased to cover the general operation, maintenance, system upgrades, and capital expenditures. An increase in the base rate would be temporarily employed and then returned to pre-shortage rates when conditions improve.

7.7 COUNCIL ORDINANCE

On March 18, 1991, the City adopted Ordinance No. 479 to implement several measures in order to curtail water consumption during times of supply shortages. The Ordinance includes specific stages of actions to be implemented during a declared water shortage, prohibited actions, and penalties for violations of the Ordinance. Additionally, the City Council will implement the provisions of the Water Conservation Plan by resolution, following a public hearing, to determine the projected water shortage and the appropriate measures or stages that should be implemented. A copy of the Ordinance is included in Appendix G.

7.8 EVALUATION OF REDUCTIONS

Under normal conditions, potable water production figures are recorded daily. Weekly and monthly reports are prepared and monitored. This data will be used as a baseline to measure the effectiveness of any water shortage contingency stage that may be implemented.

During rationing conditions, the water budget will be monitored on a weekly, daily, or hourly basis depending on the severity of the drought. During a disaster shortage, production figures will be monitored on an ongoing basis. The City's monitoring system will warn of any critical conditions instantly. In addition, meter readings will be performed more frequently than the normal bi-monthly schedule.

As stages of water shortage are declared by WBMWD, the City will follow implementation of those stages and continue to monitor water demand levels. As a member agency of MWD, WBMWD will follow MWD's WSDM Plan. It is not until Shortage Stage 5 that MWD may call for extraordinary conservation. During this stage, MWD's Drought Program Officer will coordinate public information activities with WBMWD and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided.

This Page Left Blank Intentionally

SECTION 8: WATER RECYCLING

8.1 INTRODUCTION

The Southern California region, from Ventura to San Diego, discharges over 1 billion gallons of treated wastewater to the ocean each day. This is considered a reliable and drought-proof water source and could greatly reduce the region's reliance on imported water. As technological improvements continue to reduce treatment costs, and as public perception and acceptance continue to improve, numerous reuse opportunities should develop. Recycled water is a critical part of the California water picture because of the area's high likelihood of drought. As treatment technology continues to improve, demand for recycled water will also increase.

Recycled water is defined as domestic wastewater purified through primary, secondary and tertiary treatment. Recycled water is acceptable for most non-potable water purposes such as irrigation and commercial/industrial processes. The City does not currently utilize recycled water to offset its potable water demands. If the City were to expand its water supplies to include recycled water, the City could benefit from the distribution of this water source to a number of parks, schools, and landscape medians

8.2 RECYCLED WATER POTENTIAL

WBMWD exerted an aggressive effort to provide up to 70,000 AFY of recycled water originating at the City of Los Angeles' Hyperion Wastewater Treatment Plant to users throughout the area. Recycled water for the region comes from the West Basin Water Recycling Plant (WBWRP), also known as the Edward C. Little Water Recycling Facility (ELWRF) located in El Segundo via a 36-inch pipeline. The WBWRP provides additional treatment to secondary-treated wastewater from the City of Los Angeles' Hyperion Wastewater Treatment Plant. The secondary-treated wastewater receives further treatment to meet Title 22 requirements. WBMWD produces five different qualities of recycled water including: 1) Disinfected Tertiary Water, 2) Nitrified Water, 3) Softened Reverse Osmosis Water, 4) Pure Reverse Osmosis, and 5) Ultra-Pure Reverse Osmosis Water.

Figure 8.1: Recycled Water Irrigation

WBMWD distributes recycled water to customer sites in its service area, including the City of Torrance and the City of Los Angeles. West Basin Municipal Water District recycles approximately 24 MGD, or roughly 7.7 percent of the effluent from Hyperion Treatment Plant. The remaining secondary treated wastewater from the Hyperion Plant is discharged to the ocean. Recycled water from the West Basin Water Recycling Plant is a potential source of future recycled water supply.

The City of Lomita recognizes the regional benefits of projects being implemented by the Water Replenishment District and WBMWD to use recycled water to protect the Basin through groundwater recharge and seawater intrusion barrier projects.

8.3 WASTEWATER COLLECTION

The City coordinates with the Los Angeles County Sanitation District (LACSD) to provide wastewater services within its service area. LACSD is employed to treat and dispose of City wastewater. LACSD operates one wastewater treatment plant and six water reclamation plants in the Los Angeles Basin. The sewage from the City is conveyed through Sewer mains and is routed to the Joint Water Pollution Control Plant (JWPCP) in the City of Carson. The maximum design flow of the JWPCP is 385 MGD and the maximum design peak flow is 540 MGD. Treated wastewater from the JWPCP is discharged through an outfall sewer to the Pacific Ocean located two miles offshore from White Point on the Palos Verdes Peninsula. The depth of the discharge point is approximately 200 feet below sea level. The JWPCP system includes advanced primary treatment with 60 percent secondary treatment.

Municipal wastewater is generated in the City's service area from a combination of residential, commercial, and industrial sewer discharges. The quantities of wastewater generated are generally proportional to the population and the water used in the service area. Estimates of the wastewater flows in the City's service area are included in **Table 8.1**. The wastewater flows were calculated assuming wastewater flow is equivalent to about 80 percent of the water demand. Because all wastewater treated at the JWPCP is discharged to the ocean, none of the City's wastewater is treated to recycled water standards.

Table 8.1
Past, Current and Projected Wastewater Collection

	2005	2010	2015	2020	2025	2030
Collected Wastewater	2,250	2,265	2,320	2,375	2,430	2,500

8.4 RECYCLED WATER PLANNING

Although the City supports the use of recycled water, the projected use of recycled wastewater within the City's service area for the next 25 years is uncertain. Infrastructure improvements are necessary to convey the recycled water source from WBMWD's pipelines in the City of Torrence to various distribution points within the City of Lomita. Currently, the cost of the required infrastructure renders recycled water use in the City economically unfeasible.

Since the City is not currently supplying recycled water, the City has not specifically identified potential recycled water users or prepared an optimization plan. The City did not use recycled water from 2005 to 2010. Therefore, recycled water use was not planned for the year 2010

Another aspect of optimizing recycled water use is the constant search for funding opportunities. WBMWD continues to

pursue funding by participating in Metropolitan's Local Resource Program and federal and state funding programs for recycled water projects when available.

Plans for recycled water use may develop in the future based on economics and the City's needs. Possible expansion of recycled water infrastructure planned by WBMWD may play a factor in the City's future use of recycled water. Between the City's 2005 and 2010 Urban Water Management Plans, recycled water use has remained unchanged. The City intends to continue using imported water and local groundwater along with conservation measures to increase supply reliability.

This Page Left Blank Intentionally

Appendix A: References

City of Lomita 2010 Urban Water Management Plan

References

1. City of Lomita. "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 - West Coast Basin" September, 2007
6. California Department of Water Resources. "West Coast Groundwater Basin" (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 Lomita. "Water Conservation Ordinance" Ordinance No. 497
9. City of Lomita. "Chapters 3 & 4" of City Municipal Code
10. City of Lomita. Water Production/Sales Data
11. West Basin Municipal Water District "West Basin SB7 Target Calculator" July 2010 (shows water consumption statistics for all agencies from 1995-2009

Appendix B: UWMP Act

City of Lomita 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 Lomita 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**
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 E**
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 E**
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** City is limited to 1,352 AFY but may look into future leases.
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 E**
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 E**
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 most recent US Census and City's growth rate.
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**
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		**Section 1.7** City does not have significant daytime populations or other demographic factors.
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** Groundwater Imported Water

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** 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 is not available.**
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		**Appendix F**
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		**City may pump up to 1,352 AFY**
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		**Not Applicable**
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*** **Pages 2-8**

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 Table 2.3** **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 or imported supply interruption, City will import or extract water and implement its Conservation Plan
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** **Section 4.6**

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**
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**
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**
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)**

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 2.7** **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.	**Not Applicable/Section 6** City is a Not a member of CUWCC.
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 5.5** Tables 5.4-5.10 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		**Need to address**
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**
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 G**
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** **Section 8** No current recycled water use
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** **Section 8** Recycled Water
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** **Section 8**
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** **Section 8** No current recycled water use
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 8**
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 8**
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 8**
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 8**

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 in June**
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** Public Notification already sent out. 60-day notice prior to Public Hearing. Proof of Notice & Public Hearing to be included in Appendices.
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** Public Notification already sent out. 60-day notice prior to Public Hearing. Proof of Notice & Public Hearing to be included in Appendices.
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation		**Proof of Adoption/Resolution included in Appendix E**

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 in June**
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 in June**

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: Review of DMMs for Completeness Form

City of Lomita 2010 Urban Water Management Plan

To Be Provided Later

Appendix E: Coordination, Public Notice, & City Council Resolution Adopting 2010 UWMP

City of Lomita 2010 Urban Water Management Plan

To Be Provided Later

Appendix F: West Coast Basin Judgment

City of Lomita 2010 Urban Water Management Plan

West Coast Basin Judgment

California Water Service Company, et al. vs. City of Compton, et al.

Table of Contents

INTRODUCTION

The above - entitled matter came on regularly for further trial before the Honorable George Francis, Judge of the Superior Court of the State of California, assigned by the Chairman of the Judicial Council to sit in this case on Friday the 21st day of July, 1961. Thereupon plaintiffs filed a dismissal of the action as to certain defendants named in the Complaint and in the Amended Complaint herein who are not mentioned or referred to in Paragraph III of this Judgment, and the further trial of the action proceeded in respect to the remaining parties.

The objections to the Report of Referee and to all supplemental Reports thereto, having been considered upon exceptions thereto filed with the Clerk of the Court in the manner of and within the time allowed by law, were overruled.

Oral and documentary evidence was introduced, and the matter was submitted to the Court for decision. Findings of Fact, Conclusions of Law and Judgment herein have heretofore been signed and filed.

Pursuant to the reserved and continuing jurisdiction of the Court under the Judgment herein, certain amendments to said Judgment and temporary Orders have heretofore been made and entered.

Continuing jurisdiction of the Court under said Judgment is currently assigned to the HONORABLE JULIUS M. TITLE.

The motion of defendant herein, DOMINGUEZ WATER CORPORATION, for further amendments to the Judgment, notice thereof and of the hearing thereon having been duly and regularly given to all parties, came on for hearing in Department 48 of the above-entitled Court on March 21, 1980, at 1:30 o'clock P.M., before said HONORABLE JULIUS M. TITLE. Defendant, DOMINGUEZ WATER CORPORATION, was represented by its attorneys, Helm, Budinger & Lemieux, and Ralph B. Helm. Various other parties were represented by counsel of record appearing on the Clerk's records. Hearing thereon was concluded on that date. The within "Amended Judgment" incorporates amendments and orders heretofore made to the extent presently operable and amendments pursuant to said last mentioned motion. To the extent this Amended Judgment is a restatement of the Judgment as heretofore amended, it is for convenience in incorporating all matters in one document, it is not a readjudication of such matters and is not intended to reopen any such matters. As used hereinafter the word "Judgment" shall include the original Judgment as amended to date.

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED AS FOLLOWS:

I. Existence of Basin and Boundaries Thereof.

There exists in the County of Los Angeles, State of California, an underground water basin or reservoir known and hereinafter referred to as "West Coast Basin", "West Basin" or the "Basin", and the boundaries thereof are described as follows:

Commencing at a point in the Baldwin Hills about 1300 feet north and about 100 feet west of the intersection of Marvale Drive and Northridge Drive; thence through a point about 200 feet northeasterly along Northridge Drive from the intersection of Marvale and Northridge Drives to the base of the escarpment of the Potrero fault; thence along the base of the escarpment of the Potrero fault in a straight line passing through a point about 200 feet south of the intersection of Century and Crenshaw Boulevards and extending about 2650 feet beyond this point to the southerly end of the Potrero escarpment; thence from the southerly end of the Potrero escarpment in a line passing about 700 feet south of the intersection of Western Avenue and Imperial Boulevard and about 400 feet north of the intersection of El Segundo Boulevard and Vermont Avenue and about 1700 feet south of the intersection of El Segundo Boulevard

and Figueroa Street to the northerly end of the escarpment of the Avalon-Compton fault at a point on said fault about 700 feet west of the intersection of Avalon Boulevard and Rosecrans Avenue; thence along the escarpment of the Avalon-Compton fault to a point in the Dominguez Hills located about 1300 feet north and about 850 feet west of the intersection of Central Avenue and Victoria Street; thence along the crest of the Dominguez Hills in a straight line to a point on Alameda Street about 2900 feet north of Del Amo Boulevard as measured along Alameda Street; thence in a straight line extending through a point located on Del Amo Boulevard about 900 feet west of the Pacific Electric Railway to a point about 100 feet north and west of the intersection of Bixby Road and Del Mar Avenue; thence in a straight line to a point located about 750 feet west and about 730 feet south of the intersection of Wardlow Road and Long Beach Boulevard at the escarpment of the Cherry Hill fault; thence along the escarpment of the Cherry Hill fault through the intersection of Orange Avenue and Willow Street to a point about 400 feet east of the intersection of Walnut and Creston Avenues; thence to a point on Pacific Coast Highway about 300 feet west of its intersection with Obispo Avenue; thence along Pacific Coast Highway easterly to a point located about 650 feet west of the intersection of the center line of said Pacific Coast Highway with the intersection of the center line of Lakewood Boulevard; thence along the escarpment of the Reservoir Hill fault to a point about 650 feet north and about 700 feet east of the intersection of Anaheim Street and Ximeno Avenue; thence along the trace of said Reservoir Hill fault to a point on the Los Angeles - Orange County line about 1700 feet northeast of the Long Beach City limit measured along the County line; thence along said Los Angeles - Orange County line in a southwesterly direction to the shore line of the Pacific Ocean; thence in a northerly and westerly direction along the shore line of the Pacific Ocean to the intersection of said shore line with the southerly end of the drainage divide of the Palos Verdes Hills; thence along the drainage divide of the Palos Verdes Hills to the intersection of the northerly end of said drainage divide with the shore line of the Pacific Ocean; thence northerly along the shore line of the Pacific Ocean to the intersection of said shore line with the westerly projection of the crest of the Ballona escarpment; thence easterly along the crest of the Ballona escarpment to the mouth of Centinela Creek; thence easterly from the mouth of Centinela Creek across the Baldwin Hills in a line encompassing the entire watershed of Centinela Creek to the point of beginning.

All streets, railways and boundaries of Cities and Counties herinabove referred to are as the same existed at 12:00 o'clock noon on August 20, 1961.

The area included within the foregoing boundaries is approximately 101,000 acres in extent.

II. Definitions:

1. Basin, West Coast Basin and West Basin, as these terms are interchangeably used herein, mean the ground water basin underlying the area described in Paragraph I hereof.

2. A fiscal year, as that term is used herein, is a twelve month period beginning July 1 and ending June 30.

3. A water purveyor, as that term is used in Paragraph XII hereof, means a party which sells water to the public, whether a regulated public utility, mutual water company or public entity, which has a connection or connections for the taking of imported water through The Metropolitan Water District of Southern California, through West Basin Municipal Water District, or access to such imported water through such connection, and which normally supplies at least a part of its customers' water needs with such imported water.

4. A water year, as that term is used herein, is a twelve month period beginning October 1 and ending September 30, until it is changed to a "fiscal year," as provided in Paragraph XVI hereof.

III. Declaration of Rights - Water Rights Adjudicated.

Certain of the parties to this action have no right to extract water from the Basin. The name of each of said parties is listed below with a zero following his name, and the absence of such right in said parties is hereby established and declared. Certain of the parties to this action and/or their successors in interest (through September 30, 1978) are the owners of rights to extract water from the Basin, which rights are of the same legal force and effect and without priority with reference to each other, and the amount of such rights, stated in acre-feet per year, hereinafter referred to as "Adjudicated Rights" is listed below following such parties' names, and the rights of the last-mentioned parties are hereby declared and established accordingly. Provided, however, that the Adjudicated Rights so declared and established shall be subject to the condition that the water, when used, shall be put to beneficial use through reasonable methods of use and reasonable methods of diversion; and provided further that the exercise of all of said Rights shall be subject to a pro rata reduction, if such reduction is required, to preserve said Basin as a common source of water supply.

IV. Adjudicated Rights Transferable.

Any rights decreed and adjudicated herein may be transferred, assigned, licensed or leased by the owner thereof provided, however, that no such transfer shall be complete until compliance with the appropriate notice procedures established by the Watermaster herein.

Rights adjudicated herein which are temporarily transferred, licensed or leased shall be considered the production from the Basin on behalf of such transferee, licensee or lessee which next follows his production of released exchange pool water, if any.

V. Physical Solution - Carry-over, Excess Production and Drought Carry-over.

1. *Carry-over*. In order to add flexibility to the operation of this Judgment and to assist in a physical solution to meet the water requirements in the West Basin, each of the parties to this action who is adjudged in Paragraph III hereof to have an Adjudicated Right and who, during a water year, does not extract from the Basin all of such party's Adjudicated Right, is permitted to carry over from such water year the right to extract from the Basin in the next succeeding water year an amount of water equivalent to the excess of his Adjudicated Right over his extraction during said water year not to exceed, however, 10% of such party's Adjudicated Right or two acre-feet, whichever is the larger.

2. *Excess Production*. In order to meet possible emergencies, each of the parties to this action who is adjudged in paragraph III hereof to have an Adjudicated Right is permitted to extract from the Basin in any water year for beneficial use an amount in excess of each such party's Adjudicated Right not to exceed 2 acre-feet or ten per cent (10%) of such party's Adjudicated Rights, whichever is the larger, and in addition thereto, such greater amount as may be approved by the Court. If such greater amount is recommended by the Watermaster, such order of Court may be made *ex parte*. Each such party so extracting water in excess of his Adjudicated Rights shall be required to reduce his extractions below his Adjudicated Rights by an equivalent amount in the water year next following. Such requirement shall be subject to the proviso that in the event the Court determines that such reduction will impose upon such a party, or others relying for water service upon such party, an unreasonable hardship, the Court may grant an extension of time within which such party may be required to reduce his extractions by the amount of the excess theretofore extracted by such party. If such extension of time is recommended by the Watermaster, such order of Court may be granted *ex parte*.

3. *Drought Carry-over*. By reason of this Court's Orders dated June 2, 1977, and September 29, 1977, for the water years 1976-77 and 1977-78 any party herein (including any successor in interest) can "carry-over" until utilized, any Adjudicated Right (including any authorized carry-over rights from prior years) unexercised during said water years.

VI. Physical Solution - Exchange Pool Provisions.

As a further part of said physical solution herein imposed:

1. *Mandatory Offer to Exchange Pool*. Not less than sixty (60) days prior to the beginning of each water year, each party having supplemental water available to him through then existing facilities, other than water which any such party has the right to extract hereunder, shall file with the Watermaster the offer of such party to release to the Exchange Pool the amount by which such party's Adjudicated Right exceeds one-half of the estimated total required use of water by such party during the ensuing water year, provided that the amount required to be so offered for release shall not exceed the amount such party can replace with supplemental water so available to him.

   (a) *Basis of Offer to Exchange Pool - Redetermination of Offer by Watermaster*. Such estimate of total required use and such mandatory offer shall be made in good faith and shall state the basis on which the offer is made, and shall be subject to review and redetermination by the Watermaster, who may take into consideration the prior use by such party for earlier water years and all other factors indicating the amount of such total required use and the availability of replacement water.

   (b) *Voluntary Offer to Exchange Pool*. Any party filing an offer to release water under the mandatory provisions of this Paragraph VI may also file a voluntary offer to release any part or all of any remaining amount of water which such party has the right under this Judgment to pump or otherwise extract from the Basin, and any party who is not required to file an offer to release water may file a voluntary offer to release any part or all of the amount of water which such party has the right under this Judgment to pump or otherwise extract from the basin. All such voluntary offers shall be made not less than sixty (60) days prior to the beginning of each water year.

2. *Price of Water Offered to Exchange Pool*. Each offer to release water under the foregoing subparagraph [1 (a) and 1 (b)] shall be the price per acre-foot declared and determined at the time of the filing of such offer by the releasing party; provided:

   (a) *Replacement Cost*. That such price per acre-foot shall not exceed the price which the releasing party would have to pay to obtain from others, in equal monthly amounts, through existing facilities, a quantity of supplemental water equal in amount to that offered to be released; *or*

   (b) *Maximum Price*. If any such releasing party has no existing facilities through which to obtain water from others, such price shall not exceed the sum of the price per acre-foot charged by the Metropolitan Water District of Southern California to West Basin Municipal Water District plus the additional amount per acre-foot charged by the latter to municipalities and public utilities for water received from said Metropolitan Water District.

3. *Price Dispute -Objection - Watermaster Determination Court Determination*. In the event of a dispute as to any price at which is offered for release, any party affected thereby may, within thirty (30) days thereafter, by an objection in writing, refer the matter to the Watermaster for determination. Within thirty (30) days after such objection is filed the Watermaster shall consider said objection and shall make his finding as to the price at which said water should be offered for release and notify all interested parties thereof. Any party in compliance to these Exchange Pool Provisions may file with the Court, within thirty (30) days thereafter, any objection to such finding or determination of the Watermaster and bring the same on for hearing before the Court at such time as the Court may direct, after first having served said objection upon each of the interested parties. The Court may affirm, modify, amend or overrule such finding or determination of the Watermaster. Pending such determination if the water so offered has been allocated, the party making the offer shall be paid the price declared in his offer, subject to appropriate adjustment upon final determination. The costs of such determination shall be apportioned or assessed by the Watermaster in his discretion between or to the parties to such dispute, and the Watermaster shall

have the power to require, at any time prior to making such determination, any party or parties to such dispute to deposit with the Watermaster funds sufficient to pay the cost of such determination, subject to final adjustment and review by the Court as provided in this Paragraph.

4. *Request for Water From Exchange Pool*. Not less than sixty (60) days prior to the beginning of each water year any party whose estimated required use of water during the ensuing water year exceeds the sum of the quantity of water which such party has the right under this Judgment to extract from the Basin and the quantity available to him through then existing facilities, may file with the Watermaster a request for the release of water in the amount that his said estimated use exceeds his said available supply. Such request shall be made in good faith and shall state the basis upon which the request is made, and shall be subject to review and redetermination by the Watermaster. Within thirty (30) days thereafter the Watermaster shall advise, in writing, those requesting water of the estimated price thereof. Any party desiring to amend his request by reducing the amount requested may do so after the service of such notice. Prior to the first day of each water year the Watermaster shall determine if sufficient water has been offered to satisfy all requests. If he determines that sufficient water has not been offered he shall reduce such requests pro rata in the proportion that each request bears to the total of all requests. Thereupon, not later than said first day of each water year, he shall advise all parties offering to release water of the quantities to be released by each and accepted in the Exchange Pool and the price at which such water is offered. Simultaneously, he shall advise all parties requesting water of the quantities of released water allocated from the Exchange Pool and to be taken by each requesting party and the price to be paid therefor.

5. *Allocation of Exchange Pool Water by Watermaster*. In allocating water which has been offered for release to the Exchange Pool under subparagraph 1 hereof, the Watermaster shall first allocate that water required to be offered for release and which is offered at the lowest price pursuant to subparagraph 2 hereof, and progressively thereafter at the next lowest price or prices. If the aggregate quantity of water required to be released is less than the aggregate quantity of all requests for the release of water made pursuant to subparagraph 4 hereof, he shall then allocate water voluntarily offered for release and which is offered at the lowest price and progressively thereafter at the next lowest price or prices, provided that the total allocation of water shall not exceed the aggregate of all such requests.

   Any water offered for release under subparagraph 1 hereof and not accepted in the Exchange Pool and not allocated therefrom shall be deemed not to have been offered for release and may be extracted from the Basin by the party offering the same as if such offer had not been made.

   Each party requesting the release of water for his use and to whom released water is allocated from the Exchange Pool may thereafter, subject to all of the provisions of this Judgment, extract such allocated amount of water from the Basin, in addition to the amount such party is otherwise entitled to extract hereunder during the water year for which the allocation is made.

6. *Exchange Pool Water Pumped Before Pumper's Own Right*. From and after the first day of each water year, all water extracted from the Basin by any party requesting the release of water and to whom such water is allocated shall be deemed to have been water so released until the full amount released for use by him shall have been taken, and no such party shall be deemed to have extracted from the Basin any water under his own right so to do until said amount of released water shall have been extracted. Water extracted from the Basin by parties pursuant to their request for the release of water shall be deemed to have been taken by the offerors of such water under their own rights to extract water from the Basin.

7. *Price and Payment for Water Released for Exchange Pool*. All parties allocated water under subparagraph 4 hereof shall pay a uniform price per acre-foot for such water, which price shall be the weighted average of the prices at which all the water allocated was offered for release.

Each party shall pay to the Watermaster, in five equal monthly installments during the applicable water year, an amount equal to the quantity of water allocated to him multiplied by said uniform price. The Watermaster shall bill each such party monthly for each such installment, the first such billing to be made on or before the first day of the second month of the water year involved, and payment therefor shall be made to the Watermaster within thirty (30) days after the service of each such statement. If such payment be not made within said thirty (30) days such payment shall be delinquent and a penalty shall be assessed thereon at the rate of 1% per month until paid. Such delinquent payment, including penalty, may be enforced against any party delinquent in payment by execution or by suit commenced by the Watermaster or by any party hereto for the benefit of the Watermaster.

Promptly upon receipt of such payment, the Watermaster shall make payment for the water released and allocated, first, to the party or parties which offered such water at the lowest price, and then through successive higher offered prices up to the total allocated.

VII. Additional Pumping Allowed Under Agreement With Central and West Basin Water Replenishment District, During Periods of Emergency.

Central and West Basin Water Replenishment District, a public corporation of the State of California, (Division 18, commencing with Section 60,000 of the Water Code), hereinafter "Replenishment District", overlies West Basin and engages in activities of replenishing the ground waters thereof.

During an actual or threatened temporary shortage of the imported water supply to West Basin, Replenishment District may, by resolution, determine to subsequently replenish the Basin for any water produced in excess of a party's adjudicated rights hereunder, within a reasonable period of time, pursuant to agreements with such parties (to a maximum of 10,000 acre feet), under the terms and conditions hereinafter set forth.

a. Notwithstanding any other provision of this Judgment, parties (including successors in interest) who are water purveyors, as herinabove defined, are authorized to enter into agreements with Replenishment District under which such water purveyors may exceed their Adjudicated Rights for a particular water year when the following conditions are met:

    1. Replenishment District is in receipt of a resolution of the Board of Directors of The Metropolitan Water District of Southern California ("MWD") stating there is an actual or immediately threatened temporary shortage of MWD's imported water supply compared to MWD's needs, or a temporary inability to deliver MWD's imported water supply throughout its area, which will be alleviated in part by overpumping from West Basin.

    2. The Bard of Directors of both Replenishment District and West Basin Municipal Water District (WBMWD), by resolutions, concur in the resolution of MWD's Board of Directors and each determine that the temporary overproduction in West Basin will not adversely affect the integrity of the Basin or the sea water barrier maintained along the Coast of West Basin.

    3. In said resolution, Replenishment District's Board of Directors shall set a public hearing, and notice the time, place and date thereof (which may be continued from time to time without further notice) and which said notice shall be given by First Class Mail to the current designees of the parties, filed and served in accordance with Paragraph IX of this Judgment. Said notice shall be mailed at least ten (10) days before said scheduled hearing date.

4. At said public hearing, parties (including successors in interest) shall be given full opportunity to be heard, and at the conclusion thereof the Board of Directors of Replenishment District by resolution decides to proceed with agreements under this Paragraph VII.

b. All such agreements shall be subject to the following requirements, and such reasonable others as Replenishment District's Board of Directors shall require:

1. They shall be of uniform content except as to the quantity involved, and any special provisions considered necessary or desirable with respect to local hydrological conditions or good hydrologic practice.

2. They shall be offered to all water purveyors, excepting those which Replenishment District's Board of Directors determine should not over-pump because such over-pumping would occur in undesirable proximity to a sea water barrier project designed to forestall sea water intrusion, or within, or in undesirable proximity to, an area within West Basin wherein groundwater levels are at an elevation where over-pumping is, under all the circumstances, then undesirable.

3. The maximum terms for the agreements shall be four months, all of which said agreements shall commence and end on the same day (and which may be executed at any time within said four month period), unless an extension thereof is authorized by the Court, under this Judgment.

4. They shall contain provisions that the water purveyor executing the agreement pay to the Replenishment District a price, in addition to the applicable replenishment assessment, determined on the following formula: The price per acre foot of WBMWD's treated domestic and municipal water for the water year in which the agreement is to run, less the total of: (a) an amount per acre foot as an allowance on account of incremental cost of pumping, as determined by Replenishment District's Board of Directors; and (b) the rate of the replenishment assessment of Replenishment District for the same fiscal year. If the term of the agreement is for a period which will be partially in one fiscal year and partially in another, and a change in either or both the price per acre foot of WBMWD's treated domestic and municipal water and rate of the replenishment assessment of Replenishment District is scheduled, the price formula shall be determined by averaging the scheduled changes with the price and rate then in effect, based on the number of months each will be in effect during the term of the agreement. Any price for a partial acre-foot shall be computed pro rata. Payments shall be due and payable on the principle that over-extractions under the agreement are the last water pumped in the fiscal year, and shall be payable as the agreement shall provide.

5. They shall contain provisions that: (a) All of such agreements (but not less then all) shall be subject to termination by Replenishment District if, in the Judgment of Replenishment District's Board of Directors, the conditions or threatened conditions upon which they were based have abated to the extent over-extractions are no longer considered necessary; and (b) that any individual agreement or agreements may be terminated if the Replenishment District's Board of Directors finds that adverse hydrologic circumstances have developed as a result of over-extractions by any water purveyor or purveyors which have executed said agreements, or for any other reason that Replenishment District's Board of Directors finds good and sufficient.

c. Other matters applicable to such agreements and over-pumping thereunder are as follows, and to the extent they would affect obligations of the Replenishment District they shall be anticipated in said agreements:

1. The quantity of over-pumping permitted shall be additional to that which the water purveyor could otherwise over-pump under this Judgment.

2. The total quantity of permitted overpumping under all said agreements during said four months shall not exceed ten thousand (10,000) acre feet, but the individual water purveyor shall not be responsible or affected by any violation of this requirement. That total is additional to over-extractions otherwise permitted under this Judgment.

3. Only one four month period may be utilized by Replenishment District in entering into such agreements, as to any one emergency or continuation thereof declared by MWD's Board of Directors under sub-paragraph 6 (a) hereof.

4. The *ex parte* provisions of this Judgment may be utilized in lieu of the authority contained herein (which *ex parte* provisions are not limited as to time, nature or relief, or terms of any agreements), but neither Replenishment District nor any other party shall utilize both as to any one such emergency or continuation thereof.

5. If any party claims that it is being damaged or threatened with damage by the over-extractions by any party to such an agreement, the Watermaster or any party hereto may seek appropriate action of the Court for termination of any such agreement upon notice of hearing given by the party complaining, to the party to said agreement, to the Replenishment District, and to all parties who have filed a request herein for such special notice. Any such termination shall not affect the obligation of the terminated party to make payments under the agreement for over-extractions which previously occurred thereunder.

6. Replenishment District shall maintain separate accounting and a separate fund of the proceeds from payments made pursuant to agreements entered into under this Paragraph VII. Said fund shall be utilized solely for purposes of replenishment and the replacement of waters in West Basin. Replenishment District shall, as soon as practicable, cause replenishment in West Basin by the amounts to be overproduced pursuant to this Paragraph VII, whether through spreading, injection, or in-lieu agreements.

7. Over-extractions made pursuant to the said agreements shall not be subject to the "make up" provisions of this Judgment, as amended, provided, that if any party fails to make payments as required by the agreement, Watermaster may require such "make up" under Paragraph V hereof.

8. Water Purveyor under any such agreement may, and is encouraged to, enter into appropriate arrangements with customers who have water rights in West Basin under or pursuant to this Judgment, whereby the Water Purveyor will be assisted in meeting the objectives of the agreement.

9. Nothing in this Paragraph VII limits the exercise of the reserved and continuing jurisdiction of the court as provided in Paragraph XIV hereof.

VIII. Injunction.

On and after the date hereof, each of the parties hereto, their successors and assigns, and each of their agents, employees, attorneys, and any and all persons acting by, through, or under them or any of them, are and each of them is hereby perpetually enjoined and restrained from pumping or otherwise extracting from the Basin any water in excess of said party's Adjudicated Rights, except as provided in Paragraphs V, VI, and VII hereof.

IX. Order of Pumping Credit.

Production of water from the Basin for the use or benefit of the parties hereto shall be credited to each such party in the following order:

1. Exchange Pool production (Paragraph VI).
2. Leased or licensed production (Paragraph IV).
3. Normal carry-over (Paragraph V, 1).
4. Adjudicated Right (Paragraph III).
5. Drought carry-over (Paragraph V, 3).
6. Emergency Production under Agreement with Replenishment District (Paragraph VII).

X. Loss of Decreed Rights.

It is in the best interests of the parties herein and the reasonable beneficial use of the Basin and its water supply that no party be encouraged to take and use more water than is actually required. Failure to produce all of the water to which a party is entitled hereunder shall not, in and of itself, be deemed or constitute an abandonment of such party's right in whole or in part.

No taking of water under Paragraphs III, V, VI and VII hereof, by any party to this action shall constitute a taking adverse to any other party; nor shall any party to this action have the right to plead the statute of limitations or an estoppel against any other party by reason of his said extracting of water from the Basin pursuant to a request for the release of water; nor shall such release of water to the Exchange Pool by any party constitute a forfeiture or abandonment by such party of any part of his Adjudicated Right to water; nor shall such release in anywise constitute a waiver of such right although such water, when released under the terms of this Judgment may be devoted to a public use; nor shall such release of water by any such party in anywise obligate any party so releasing to continue to release or furnish water to any other party or his successor in interest, or to the public generally, or to any party thereof, otherwise than as provided herein.

XI. Watermaster Appointment.

The Watermaster shall be the Department of Water Resources of the Resources Agency of the State of California, to serve at the pleasure of the Court, and said Watermaster shall administer and enforce the provisions of this Judgment and the instructions and subsequent orders of this Court, and shall have the powers and duties hereinafter set forth. If any such provisions, instructions or orders of the Court shall have been disobeyed or disregarded, said Watermaster is hereby empowered and directed to report to the Court such fact and the circumstances connected therewith and leading thereto.

XII. Watermaster - Powers and Duties.

In order to assist the Court in the administration and enforcement of the provisions of this Judgment and to keep the Court fully advised in the premises, the Watermaster shall have the following duties in addition to those provided for elsewhere herein:

1. *Parties to Measure and Record Static Water Level of Each Well*. The Watermaster may require each party, at such party's own expense, to measure and record not more often than once a month, the elevation of the static water level in such of his wells in the Basin as are specified by the Watermaster.

2. *Parties to Install Meters on Wells and Record Production Therefrom*. The Watermaster may require any party hereto owning any facilities for pumping or otherwise extracting water from the Basin, at such party's own expense, to install and at all times maintain in good working order, mechanical measuring devices, approved by the Watermaster, and keep records of water

production, as required by the Watermaster, through the use of such devices. However, if in the opinion of the Watermaster such mechanical devices are not practicable or feasible, the Watermaster may require such party to submit estimates of his water production, together with such information and data as is used by such party in making such estimate. Upon the failure of any party to install such device or devices on or before the date the Watermaster shall fix for such installation, or to provide the Watermaster with estimates of water production and information on which such estimates are based, the Watermaster may give the Court and the party notice of such failure for proper action in the premises.

3. *Watermaster to Assemble Records and Data and Evaluate Same*. The Watermaster shall collect and assemble the records and other data required of the parties hereto, and evaluate such records and other data. Such records and other data shall be open to inspection by any party hereto or his representative during normal business hours.

4. *Watermaster's Annual Budget*. The Watermaster shall prepare a tentative budget for each water year, stating the estimated expense for administering the provisions of this Judgment. The Watermaster shall mail a copy of said tentative budget to the designee of each of the parties hereto having an Adjudicated Right, at least sixty (60) days before the beginning of each water year. If any such party has any objection to said tentative budget or any suggestions with respect thereto, he shall present the same in writing to the Watermaster within fifteen (15) days after service of said tentative budget upon him. If no objections are received, the tentative budget shall become the final budget. If objections to said tentative budget are received, the Watermaster shall, within then (10) days thereafter, consider such objections, prepare a final budget, and mail a copy thereof to each such party's designee, together with a statement of the amount assessed to each such party, computed as provided in subparagraph 5 of this Paragraph XII. Any such party whose objections to said tentative budget are denied in whole or in part by the Watermaster may, within fifteen (15) days after the service of the final budget upon him, make written objection thereto by filing his objection with the Court after first mailing a copy of such objection to each party's designee, and shall bring such objection on for hearing before the Court at such time as the Court may direct. If objection to such budget be filed with the Court as herein provided, then the said budget and any and all assessments made as herein provided may be adjusted by the Court following said hearing.

5. *Watermaster's Fees as Parties' Costs*. The fees compensation or other expenses of the Watermaster hereunder shall be borne by the parties hereto having Adjudicated Rights in the proportion that each such party's Adjudicated Right bears to the total Adjudicated Rights of all such parties, and the Court or Watermaster shall assess such costs to each such party accordingly.

   Payment thereof, whether or not subject to adjustment by the Court as provided in this Paragraph XII, shall be made by each such party, on or prior to the beginning of the water year to which said final budget and statement of assessed costs is applicable. If such payment by any party is not made on or before said date, the Watermaster shall add a penalty of 5% thereof to such party's statement. Payment required of any party hereunder may be enforced by execution issued out of the Court, or as may be provided by any order hereinafter made by the Court, or by other proceedings by the Watermaster or by any party hereto on the Watermaster's behalf.

   All such payments and penalties received by the Watermaster shall be expended by him for the administration of this Judgment. Any money remaining at the end of any water year shall be available for such use in the following water year.

6. *Watermaster's Annual Report*. The Watermaster shall prepare an annual report within ninety (90) days after the end of each water year covering the work of the Watermaster during the preceding water year and a statement of his receipts and expenditures.

7. *Watermaster Report to Contain All Basin Production*. The Watermaster shall report separately, in said annual report, all water extractions in the Basin, including that by producers who have no "Adjudicated Right."

8. *Watermaster Rules and Regulations*. The Watermaster may prescribe such reasonable Rules and Regulations as will assist him in the performance of his duties hereunder.

9. *Other Watermaster Duties*. The Watermaster shall perform such other duties as directed by the Court and as may be otherwise provided by law.

XIII. Objection to Watermaster Determination - Notice Thereof and Hearing Thereon.

Any party hereto having an Adjudicated Right who has objection to any determination or finding made by the Watermaster, other than as provided in Paragraphs VI and XII hereof, may make such objection in writing to the Watermaster within thirty (30) days after the date the Watermaster gives written notice of the making of such determination or finding, and within thirty (30) days thereafter the Watermaster shall consider said objection and shall amend or affirm such finding or determination and shall give notice thereof to all parties hereto having Adjudicated Rights. Any such party may file with the Court within thirty (30) days from the date of said notice any objection to such final finding or determination of the Watermaster and bring the same on for hearing before the Court at such time as the Court may direct, after first having served said objection upon each of the parties hereto having an Adjudicated Right. The Court may affirm, modify, amend or overrule any such finding or determination of the Watermaster.

XIV. Reserved and Continuing Jurisdiction of Court.

The Court hereby reserves continuing jurisdiction and, upon application of any party hereto having an Adjudicated Right or upon its own motion, may review (1) its determination of the safe yield of the Basin, or (2) the Adjudicated Rights, in the aggregate, of all of the parties as affected by the abandonment or forfeiture of any such rights, in whole or in part, and by the abandonment or forfeiture of any such rights by any other person or entity, and, in the event material change be found, to adjudge that the Adjudicated Right of each party shall be ratably changed; provided, however, that notice of such review shall be served on all parties hereto having Adjudicated Rights at least thirty (30) days prior thereto. Except as provided herein, and except as rights decreed herein may be abandoned or forfeited in whole or in part, each and every right decreed herein shall be fixed as of the date of the entry hereof.

XV. Judgment Modifications and Further Orders of Court.

The Court further reserves jurisdiction so that at any time, and from time to time, upon its own motion or upon application of any party hereto having an Adjudicated Right, and upon at least thirty (30) days notice to all such parties, to make such modifications of or such additions to, the provisions of this Judgment, or make such further order or orders as may be necessary or desirable for the adequate enforcement, protection or preservation of the Basin and of the rights of the parties as herein determined.

XVI. Subsequent Change From Water Year to Fiscal Year.

"Water year" as used in Paragraphs V,VI,VII and XII hereof shall, beginning with the first "fiscal year" (July 1 - June 30) commencing at least four months after this "Amended Judgment" becomes final, and thereafter, mean the "fiscal year". Since this changeover will provide a transitional accounting period of nine months, October 1 - June 30, notwithstanding the findings and determinations in the annual Watermaster Report for the last preceding water year, the Adjudicated Right of each of the parties hereto permitted to be extracted from the West Basin for said transitional accounting period shall be on the basis of three-quarters of each said party's otherwise Adjudicated Right. The Watermaster herein shall convert the times of his duties hereunder, including the rendition of a nine month report for the said transitional

accounting period (October 1 - June 30), to coincide with the changeover from the water year to the fiscal year hereunder.

XVII. Designees of Parties for Future Notice and Service.

Service of this "Amended Judgment" on those parties who have executed and filed with the Court "Agreement and Stipulation for Judgment" or otherwise have named a designee, filed the same herein and have therein designated a person thereafter to receive notices, requests, demands, objections, reports, and all other papers and processes in this cause, shall be made by first class mail, postage prepaid, addressed to such designees (or their successors) and at the address designated for that purpose.

Each party who has not heretofore made such a designation shall, within thirty (30) days after the Amended Judgment herein shall have been served upon that party or his designee, file with the Court, with proof of service of a copy thereof upon the Watermaster, a written designation of the person to whom and the address at which all future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon that party or delivered to that party, are to be so served or delivered.

A later substitute or successor designation filed and served in the same manner by any party shall be effective from the date of such filing as to the then future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon or delivered to that party.

Delivery to or service upon any party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to a party under or pursuant to this Judgment, may be by deposit in the mail, first class, postage prepaid, addressed to the latest designee and at the address in said latest designation filed by that party.

Parties hereto who have not entered their appearance or whose default has been entered and who are adjudged herein to have an Adjudicated Right, and who have not named a designee for service herein, shall be served with all said future notices, papers and process herein, and service herein shall be accomplished, by publication of a copy of such said notice, paper or process addressed to, "Parties to the West Basin Adjudication"; said publication shall be made once each week for two successive weeks in a newspaper of general circulation, printed and published in the County of Los Angeles, State of California, and circulated within the West Basin Area; the last publication of which shall be at least two weeks and not more than five weeks immediately preceding the event for which said notice is given or immediately preceding the effective date of any order, paper or process; in the event an effective date other than the date of its execution is fixed by the Court in respect of any order, paper or process, said last publication shall be made not more than five weeks following an event, the entry of an order by the Court, or date of any paper or process with respect to which such notice is given.

XVIII. Intervention of Successors In Interest and New Parties.

Any person who is not a party herein or successor to such party and who proposes to produce water from the Basin may seek to become a party to this Judgment, through a Stipulation In Intervention entered into with the Watermaster. Watermaster may execute said Stipulation on behalf of the other parties herein, but such Stipulation shall not preclude a party from opposing such intervention at the time of the court hearing thereon. Said Stipulation for Intervention must thereupon be filed with the Court, which will consider an order confirming said intervention following thirty (30) days notice thereof to the parties, served as herein provided. Thereafter, if approved by the Court, such Intervenors shall be a party herein, bound by this Judgment and entitled to the rights and privileges accorded under the physical solution imposed herein.

XIX. Judgment Binding on Successors.

Subject to the specific provisions hereinbefore contained, this Judgment and all provisions thereof are applicable to, binding upon and inure to the benefit of not only the parties to this action, but as well to their

respective heirs, executors, administrators, successors, assigns, lessees, licensees and to the agents, employees and attorneys-in-fact of any such persons.

XX. Effect of Amended Judgment on Orders Heretofore Made and Entered Herein.

This Amended Judgment shall not abrogate the rights of any additional carry-over of unused Adjudicated Rights of the parties herein, as may exist pursuant to the orders herein filed June 2, 1977, and September 29, 1977.

ORDER AMENDING JUDGMENT
(Filed with County Clerk on March 8, 1989)

GOOD CAUSE APPEARING upon the duly-noticed Motion of West Basin Municipal Water District:

IT IS HEREBY ORDERED THAT THE JUDGMENT HEREIN BE AMENDED AS FOLLOWS:

"NON-CONSUMPTIVE PRACTICES

1. Any party herein may petition the Watermaster for a non-consumptive water use permit as part of a project to recover old refined oil or other pollutants that has leaked into the underground aquifers of the Basin. If the petition is granted as set forth in this part, the petitioner may extract the groundwater covered by the petition without the production counting against the petitioner's production rights.

2. If the Watermaster determines that there is a problem of groundwater contamination which the proposed project will remedy or ameliorate, an operator may make extractions of groundwater to remedy or ameliorate that problem if the water is not applied to beneficial surface use, its extractions are made in compliance with terms and conditions established by the Watermaster, and the Watermaster has determined either of the following:

a. The groundwater to be extracted is unusable and cannot be economically blended for use with other water.
b. The proposed program involves extraction of usable water in the same quantity as will be returned to the underground without degradation of quality.

3. The Watermaster may provide those terms and conditions the Watermaster deems appropriate, including, but not limited to, restrictions on the quantity of extractions to be so exempted, limitations on time, periodic reviews, requirement of submission of test results from a Watermaster-approved laboratory, and any other relevant terms or conditions.

4. The Watermaster shall conduct a public hearing on the petition and all parties herein and their representatives shall have an opportunity to be heard concerning the same.

5. The Watermaster shall, in its discretion, grant or deny the petition and fix a reasonable annual administrative fee to be paid to the Watermaster by the permittee. Within fifteen (15) days after the rendition of its decision, the Watermaster shall give written notice thereof to the designees of all parties herein.

6. After a noticed, public hearing, the Watermaster may, on the motion of any party herein or on its own motion, interrupt or stop a project for non-compliance with the terms of its permit or rescind or modify the terms of a permit to protect the integrity of the Basin of the Judgment herein. An order to interrupt or stop a project or to rescind or modify the terms of a permit shall apply to groundwater extractions occurring more than 10 days after the date of the order. The permit holder and the designees of all parties herein shall be given two weeks written notice of any hearing to consider interrupting or stopping a permitted project or

the rescission or modification of the terms of a permit. Notice will be deemed given when mailed by first-class mail or when personally delivered.

7. The Watermaster's decision to grant, deny, modify or revoke a permit or to interrupt or stop a permitted project may be appealed to this court within thirty (30) days of the notice thereof and upon thirty (30) days notice to the designees of all parties herein.

8. The Watermaster shall monitor and periodically inspect the project for compliance with the terms and conditions of the permit hereunder.

9. No party shall recover costs from any other party herein."

IT IS FURTHER ORDERED that the amendment to the judgment approved by the court on March 22, 1984 ("former amendment") is hereby repealed, provided, all permits issued by the Watermaster under the former amendment shall be deemed under the instant amendment.

Appendix G: Lomita Municipal Code Chapters 3 & 4

City of Lomita 2010 Urban Water Management Plan

Chapter 3

MUNICIPAL WATER SYSTEM

ARTICLE I. IN GENERAL

Sec. 12-3.01. Authority to adopt.

The city council may from time to time adopt rules and regulations which shall govern the operation of the city's municipal water system and shall delegate to an identified city employee the power to enforce said rules and regulations.
(Ord. No. 457, § 1, 1-2-90)

Note—See § 12-3.03.

Sec. 12-3.02. Unauthorized use of city water.

No person, company, corporation or other agency shall take water from the city's water system without first obtaining permission to take water from the city's engineer or authorized representative and making payment of applicable processing and water supply charges of the city. For purposes of enforcement of this section, no more than one (1) violation per day per point of access to the city's water supply system will be deemed in violation of this section.
(Ord. No. 457, § 1, 1-2-90)

Note—See § 12-3.03.

Sec. 12-3.03. Rules and regulations adopted.

Editor's note—Ord. No. 520, adopted Aug. 2, 1993, did not specifically amend this Code; hence, inclusion of § 2 as § 12-3.03 was at the discretion of the editor. Existing §§ 12-3.03, 12-3.04 were redesignated §§ 12-3.04, 12-3.05.

The city council does hereby adopt the following rules and regulations governing the operation of the city's municipal water system:

(a) *Disconnection for Nonpayment:*

(1) Water charges shall be due and payable upon presentation and shall become delinquent if not paid. If water charges are not paid within the period allowed by the city, then the municipal water department ("department") shall mail a notice of delinquency and impeding termination of services. The notice shall set a date for disconnection of service.

(2) The department shall make a reasonable attempt to contact an adult person residing at the premises of the customer by telephone or personal contact at least twenty-four (24) hours prior to any termination of service. Whenever telephone or personal service cannot be accomplished, the public utility shall give by mail, in person or by posting in a conspicuous location at the premises a notice of termination of services, at least forty-eight (48) hours prior to termination.

(3) Every notice of termination shall include the following information:

a. The name and address of the customer whose account is delinquent.

b. The amount of the delinquency.

c. The date by which payment or arrangements for payment is required in order to avoid termination.

d. The procedure by which the customer may initiate a complaint or request an investigation servicing service or charges, unless the department's bill contains such information

e. The procedure by which the customer may request amortization of the unpaid charges.

f. The procedure for the customer to obtain information on the availability of financial assistance, including private, local, state or federal sources, if applicable.

g. The telephone number of a representative of the department who can provide additional information or arrange for payment.

(4) Upon complying with the notice requirements, the department may disconnect water service unless one (1) of the following situations exists:

a. During the pendency of an investigation by the public utility of a customer dispute or complaint.

b. When a customer has been granted an extension of the period for payment of a bill.

c. On a certification of a licensed physician and surgeon that to do so will be life threatening to the customer and the customer is financially unable to pay for service within the normal payment period and is willing to enter into an amortization agreement with the department with respect to all charges that the customer is unable to pay prior to delinquency. If the unpaid balance of the bill is asserted to be beyond the means of the customer to pay within the normal period for payment, the department shall permit the customer to amortize the unpaid balance of the bill over a period not to exceed twelve (12) months.

(5) Water service may not be disconnected for reasons of delinquency on any Saturday, Sunday, legal holiday or at any time during which the business offices of the public utility are not open to the public

(b) *Reconnecting Water Service:*

(1) There shall be a charge as established by city council resolution for the turning on of any water services after shutoff by reason of delinquency. The charge established by city council resolution for the turning on of any water shall be in addition to payment of past-due amounts for water service and any applicable penalties due because of the delinquency. These required payments shall be made at the cashier's office at City Hall.

(2) If a prior owner of the property, structure or premises has not paid the past-due amount for water service and any applicable penalties, then water service shall not be reconnected at that location until the current owner of the property, structure or premises has paid the past-due amount for water service and any applicable penalties

(3) If water service has been disconnected to any building, apartment or house used for residential purposes by a tenant who is not an owner of the structure, the department shall not seek to recover any charges or penalties for the furnishing of water for the subsequent tenant's residential use on account of nonpayment of previous charges by a previous tenant. The department may, at its sole option, require that water service to subsequent tenants be furnished on the account of the landlord or property owner

(Ord. No. 520, § 2, 8-2-93)

Sec. 12-3.04. Citations.

The director of public works shall authorize designated city employees or the city's law enforcement officers who shall be authorized to issue citations to individuals violating any ordinance or regulation of the city governing its water system. Such citation shall be personally served upon the person violating the regulations or ordinances of the city or upon any employee, agent or representative thereof, and shall specify the regulation or ordinance violated, the dates of violation, the date of service of citation, the person issuing the citation, and the person receiving the citation.

(Ord. No. 457, § 1, 1-2-90)

Note—See the editor's note to § 12-3.03.

Sec. 12-3.05. Violation deemed an infraction.

Any violation of this chapter or of the rules and regulations established hereunder shall be deemed an infraction and shall be punishable by a fine of one hundred dollars ($100.00) for the first violation, two hundred dollars ($200.00) for a second violation within one (1) year of the first violation, and five hundred dollars ($500.00) for each additional violation after the second violation which occurs within one (1) year from the first violation.

(Ord. No. 457, § 1, 1-2-90; Ord. No. 477, § I, 2-19-91)

Note—See the editor's note to § 12-3.03.

Secs. 12-3.06—12-3.15. Reserved.

ARTICLE 2. CROSS-CONNECTION CONTROL PROGRAM

Sec. 12-3.16. Purpose.

The purpose of this article is (1) to protect the public water supply against actual or potential contamination through cross-connections by isolating sources of contamination that may occur within a water user's premises because of some undiscovered or unauthorized cross-connection on the premises; (2) to eliminate existing connections between drinking water

systems and other sources of water that are not approved as safe and potable for human consumption; (3) to eliminate cross-connections between drinking water systems and sources of contamination; (4) to prevent the making of cross-connections in the future.

This article is adopted pursuant to the California Health and Safety Code (Sections 4026., 4026.5., 4049.50 and 4049.51 and California Code of Regulations, Title 17, Sections 7583—7605, entitled "Regulations Relating to Cross-Connections".

It is unlawful for any person, firm, or corporation at any time to make or maintain or cause to be made or maintained, temporarily or permanently, for any period of time whatsoever, any cross-connection between plumbing pipes or water fixtures being served with water by the city and any other source of water supply or to maintain any sanitary fixture or other appurtenances or fixtures which, by reason of their construction, may cause or allow backflow of water or other substances into the water supply system of the city and/or the service of water pipes or fixtures of any consumer of the city.
(Ord. No. 525, § 1, 7-18-94)

Sec. 12-3.17. Definitions.

[For the purpose of this article, the following words and phrases shall have the meanings respectively ascribed to them by this section.]

(a) *Air-Gap Separation*: The term "air-gap separation" means a physical break between a supply pipe and a receiving vessel. The air-gap shall be at least double the diameter of the supply pipe, measured vertically above the top rim of the vessel, in no case less than one (1) inch.

(b) *Approved Backflow Prevention Assembly*: The term "approved backflow prevention assembly" shall mean an assembly which has passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the California Department of Health Services.

(c) *Approved Water Supply*: The term "approved water supply" means any water supply whose potability is regulated by a state or local health agency.

(d) *Auxiliary Water Supply*: The term "auxiliary water supply" means any water supply on or available to the premises other than an approved water supply.

(e) *AWWA Standard*: The term "AWWA Standard" means an official standard developed and approved by the American Water Works Association (AWWA).

(f) *Backflow*: The term "backflow" shall mean a flow condition, caused by a differential in pressure, that causes the flow of water or other liquids, gases, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than an approved water supply source. Back siphonage is one cause of backflow. Back pressure is, the other cause.

(g) *City*: The City of Lomita, California.

(h) *Contamination*: The term "contamination" means degradation of the quality of the potable water by any foreign substance which creates a hazard to the public health, or which may impair the usefulness or quality of the water.

(i) *Cross-Connection*: The term "cross-connection" as used in this article means any unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or other devices through which backflow could occur, shall be considered to be cross-connections.

(j) *Double Check Valve Assembly*: The term "double check valve assembly" means an assembly of two (2) internally loaded, independently acting check valves, including resilient seated shut-off valves on each end of the assembly and test cocks for testing the water tightness of each check valve.

(k) *Health Agency*: The term "health agency" means the California Department of Health Services.

(l) *Local Health Agency*: The term "local health agency" means the Los Angeles County Department of Health Services.

(m) *Person*: The term "person" means an individual, corporation, company, association, partnership, municipality, public utility, or their public body or institution.

(n) *Premises*: The term "premises" means any and all areas on a water user's property which are served or have the potential to be served by the public water system.

(o) *Public Water System*: The term "public water system" means a system for the provision of piped water to the public for human consumption that has five (5) or more service connections or regularly serves an average of twenty-five (25) individuals daily at least sixty (60) days out of the year.

(p) *Reclaimed Water*: The term "reclaimed water" means a wastewater which, as a result of treatment, is suitable for uses other than potable use.

(q) *Reduced Pressure Principle Backflow Prevention Assembly*: The term "reduced pressure principle backflow prevention assembly" means an assembly incorporating two (2) internally loaded, independently operating check valves and an automatically operating differential relief valves [valve] located between the two (2) checks, including resilient seated shut-off valves on each end of the assembly, and equipped with necessary test cocks for testing the assembly.

(r) *Service Connection*: The term "service connection" refers to the point of connection of a user's piping to the water supplier's facilities.

(s) *Water Supplier*: The term "water supplier" means the city who owns and operates the approved water supply system.

(t) *Water User.* The term "water user" means any person obtaining water from an approved water supply stem.
(Ord. No. 525, § 1, 7-18-94)

Sec. 12-3.18. Cross-connection protection requirements.

(a) *General Provisions.*

(1) Unprotected cross-connections with the public water supply are prohibited.

(2) Whenever backflow protection has been found necessary, the city will require the water user to install an approved backflow prevention assembly by and at his expense for continued services or before a new service will be granted.

(3) Wherever backflow protection has been found necessary on a water supply line entering a water user's premises, then any and all water supply lines from the city's mains entering such premises, buildings, or structures shall be protected by an approved backflow prevention assembly. The type of assembly to be installed will be in accordance with the requirements of this article.

(b) *Where Protection is Required.*

(1) Each service connection from the city's water system for supplying water to premises having an auxiliary water supply shall be protected against backflow of water from the premises into the public water system unless the auxiliary water supply is accepted as an additional source by the city, and is approved by the public health agency having jurisdiction.

(2) Each service connection from the city's water system for supplying water to any premises on which any substance is handled in such fashion as may allow its entry into the water system shall be protected against backflow of the water from the premises into the public system. This shall include the handling of process waters and waters originating from the city's water system which have been subjected to deterioration in sanitary quality.

(3) Backflow prevention assemblies shall be installed on the service connection to any premises having (a) internal cross-connection that cannot be permanently corrected and controlled to the satisfaction of the state or local health department and the city's, or (b) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not cross-connections exist.

(c) *Type of Protection Required.*

(1) The type of protection that shall be provided to prevent backflow into the approved water supply shall [be] commensurate with the degree of hazard that exists on the consumer's premises. The type of protective assembly that may be required (listing in an increasing level of protection) includes: Double Check Valve Assembly (DC), Reduced Pressure Principle Backflow Prevention Assembly (RP), and an Air-gap Sepa-

ration (AG). The water user may choose a higher level of protection than required by the city. The minimum types of backflow protection required to protect the approved water supply at the user's water connection to premises with varying degrees of hazard are given in Table 1. Situations which are not covered in Table 1 shall be evaluated on a case-by-case basis and the appropriate backflow protection shall be determined by the city and the health agency.

Table 1
TYPE OF BACKFLOW PROTECTION REQUIRED

Degree of Hazard	*Minimum Type of Backflow Prevention*
(a) Sewage and Hazardous Substances	
(1) Premises where the public water system is used to supplement the reclaimed water supply.	AG
(2) Premises where there are wastewater pumping and/or treatment plants and there is no interconnection with the potable water system. This does not include a single family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and the city.	AG
(3) Premises where reclaimed water is used and there is no interconnection with the potable water system. A RP may be provided in lieu of an AG if approved by the health agency and the city.	AG
(4) Premises where hazardous substances are handled in any manner in which the substances may enter a potable water system. This does not include a family RP residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and the city.	RP
(5) Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected.	RP
(b) Auxiliary Water Supplies	
(1) Premises where there is an unapproved auxiliary water supply which is interconnected with the public water system. A RP or DC may be provided in lieu of an AG if approved by the health agency and the city.	AG
(2) Premises where there is an unapproved auxiliary water supply and there are no interconnections with the public water system. A DC may be provided in lieu of a RP if approved by the health agency and city.	

Degree of Hazard	*Minimum Type of Backflow Prevention*
(c) Fire Protection Systems	
(1) Premises where the fire system is directly supplied from the public water system and there is an unapproved auxiliary water supply on or to the premises (not interconnected).	DC
(2) Premises where the fire system is supplied from the public water system and interconnected with an unapproved auxiliary water supply. A RP may be provided in lieu of an AG if approved by the health agency and city	AG
(3) Premises where the fire system is supplied from the public water system and where either elevated DC storage tanks or fire pumps which take suction from the private reservoirs or tanks are used.	DC
(d) Dockside Water Points and Marine Facilities	
(1) Pier hydrants for supplying water to vessels for any purpose	RP
(2) Premises where there are marine facilities.	RP
(e) Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist.	RP
(f) Premises where there is a repeated history of cross-connections being established or re-established.	RP

(2) Two (2) or more services supplying water from different street mains to the same building, structure, or premises through which an interstreet main flow may occur, shall have at a minimum an approved double check valve on each water service to be located adjacent to and on the property side of the respective meters. Such an approved double check valve shall not be considered adequate if backflow protection is deemed necessary to protect the city's mains from pollution or contamination; in such cases the installation of an approved reduced pressure backflow assemblies [assembly] at such service connections shall be required.

(Ord. No. 525, § 3, 7-18-94)

Sec. 12-3.19. Backflow prevention assemblies.

(a) *Approved Backflow Prevention Assemblies*

(1) Only backflow prevention assemblies which have been approved by the city shall be acceptable for installation by a water user connected to the city's potable water system.

(2) The city will provide, upon request, to any affected customer a list of approved backflow prevention assemblies.

(b) *Backflow Prevention Assembly Installation.*

(1) Backflow prevention assemblies shall be installed in a manner prescribed in Section 7603, Title 22 of the California Administrative Code. Location of the assemblies should be as close as practical to the user's connection. The city shall have the final authority in determining the required location of a backflow prevention assembly.

a. *Air-gap separation (AG).* The air-gap separation shall be located on the user's side of and as close to the service connection as is practical. All piping from the service connection to the receiving tank shall be above grade and be entirely visible. No water use shall be provided from any point between the service connection and the air-gap separation. The water inlet piping shall terminate a distance of at least two (2) pipe diameters of the supply inlet but in no case less than one (1) inch above the overflow rim of the receiving tank.

b. *Reduced pressure principle backflow prevention assembly (RP).* The approved reduced pressure principle backflow prevention assembly shall be installed on the user's side of and as close to the service connection as is practical. The assembly shall be installed a minimum of twelve (12) inches above grade and not more than thirty-six (36) inches above grade measured from the bottom of the assembly and with a minimum of twelve (12) inches side clearance. The assembly shall be installed so that it is readily accessible for maintenance and testing. Water supplied from any point between the service connection and the RP assembly shall be protected in a manner approved by the city.

c. *Double check valve assembly (DC).* The approved double check valve assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance. If a double check valve assembly is put below grade it must be installed in a vault such that there is a minimum of six (6) inches between the bottom of the vault and the bottom of the assembly, so that the top of the assembly is no more than a maximum of eight (8) inches below grade, so there is a minimum of twenty-four (24) inches of clearance between the side of the assembly with the test cocks and the side of the vault, and so there is a minimum of twelve (12) inches clearance between the other side of the assembly and the side of the vault. Special consideration must be given to double check valve assemblies of the "Y" type. These assemblies must be installed on their "side" with the test cocks in a vertical position so that either check valve may be removed for service without removing the assembly. Vaults which do not have an integrated bottom must be placed on a three-inch layer of gravel.

(c) *Backflow Prevention Assembly Testing and Maintenance.*

(1) The owners of any premises on which, or on account of which, backflow prevention assemblies are installed, shall have the assemblies tested by a person who has demonstrated their competency in testing of these assemblies to the city. Backflow prevention assemblies must be tested at least annually and immediately after installa-

tion, relocation or repair. The city may require a more frequent testing schedule if it is determined to be necessary. No assembly shall be placed back in service unless it is functioning as required. A report in a form acceptable to the city shall be filed with the city each time an assembly is tested, relocated, or repaired. These assemblies shall be serviced, overhauled, or replaced wherever they are found to be defective and all costs of testing, repair, and maintenance shall be borne by the water user.

(2) The city will supply affected water users with a list of persons acceptable to the city to test backflow prevention assemblies. The city will notify affected customers by mail when annual testing of an assembly is needed and also supply users with the necessary forms which must be filled out each time an assembly is tested or repaired.

(d) *Backflow Prevention Assembly Removal.*

(1) Approval must be obtained from the city before a backflow prevention assembly is removed, relocated, or replaced.

a. *Removal:* The use of an assembly may be discontinued and the assembly removed from service upon presentation of sufficient evidence to the city to verify that a hazard no longer exists or is not likely to be created in the future;

b. *Relocation:* An assembly may be relocated following confirmation by the city that the relocation will continue to provide the required protection and satisfy installation requirements. A retest will be required following the relocation of the assembly;

c. *Repair:* An assembly may be removed for repair, provided the water use is either discontinued until repair is completed and the assembly is returned to service, or the service connection is equipped with other backflow protection approved by the city. A retest will be required following the repair of the assembly; and

d. *Replacement:* An assembly may be removed and replaced provided the water use is discontinued until the replacement assembly is installed. All replacement assemblies must be approved by the city and must be commensurate with the degree of hazard involved.

(Ord. No. 525, § 4, 7-18-94)

Sec. 12-3.20. User supervisor.

At each premises where it is necessary, in the opinion of the city, a user supervisor shall be designated by and at the expense of the water user. This user supervisor shall be responsible for the monitoring of the backflow prevention assemblies and for avoidance of cross-connections. In the event of contamination or pollution of the drinking water system due to a cross-connection on the premises, the city shall be promptly notified by the user supervisor so that appropriate measures may be taken to overcome the contamination. The water user shall inform the city of the user supervisor's identity on, as a minimum, an annual basis and whenever a change occurs.

(Ord. No. 525, § 5, 7-18-94)

Sec. 12-3.21. Administrative procedures.

(a) *Water System Survey.*

(1) The city shall review all requests for new services to determine if backflow protection is needed. Plans and specifications must be submitted to the city upon request for review of possible cross-connection hazards as a condition of service for new service connections. If it is determined that a backflow prevention assembly is necessary to protect the public water system, the required assembly must be installed before service will be granted.

(2) The city may require an on-premises inspection to evaluate cross-connection hazards. The city will transmit a written notice requesting an inspection appointment to each affected water user. Any water user who cannot or will not allow an on-premises inspection of his piping system shall be required to install the backflow prevention assembly the city considers necessary.

(3) The city may, at its discretion, require a reinspection for cross-connection hazards of any premises to which water is served. The city will transmit a written notice requesting an inspection appointment to each affected water user. Any water user who cannot or will not allow an on-premises inspection of his piping system shall be required to install the backflow prevention assembly the city considers necessary.

(b) *Customer Notification Assembly Installation.*

(1) The city will notify the water user of the survey findings, listing the corrective actions to be taken if any are required. A period of sixty (60) days will be given to complete all corrective actions required, including installation of backflow prevention assemblies.

(2) A second notice will be sent to each water user who does not take the required corrective actions prescribed in the first notice within the sixty-day period allowed. The second notice will give the water user a two-week period to take the required corrective action. If no action is taken within the two-week period the city may terminate water service to the affected water user until the required corrective actions are taken.

(d) *Customer Notification Testing and Maintenance.*

(1) The city will notify each affected water user when it is time for the backflow prevention assembly installed on their service connection to be tested. This written notice shall give the water user thirty (30) days to have the assembly tested and supply the water user with the necessary form to be completed and resubmitted to the city.

(2) A second notice shall be sent to each water user which does not have his/her backflow prevention assembly tested as prescribed in the first notice within the thirty-day period allowed. The second notice will give the water user a two-week period to have his/her backflow prevention assembly tested. If no action is taken within the two-week period, the city may terminate water service to the affected water user until the subject assembly is tested.

(Ord. No. 525, § 6, 7-18-94)

Sec. 12-3.22. Water service termination.

(a) *General.* When the city encounters water uses that represent a clear and immediate hazard to the potable water supply that cannot be immediately abated, the city shall institute the procedure for discontinuing the water service.

(b) *Basis For Termination.* Conditions or water uses that create a basis for water service termination shall include, but are not limited to, the following items.

(1) Refusal to install a required backflow prevention assembly;

(2) Refusal to test a backflow prevention assembly;

(3) Refusal to repair a faulty backflow prevention assembly;

(4) Refusal to replace a faulty backflow prevention assembly;

(5) Direct or indirect connection between the public water system and a sewer line;

(6) Unprotected direct or indirect connection between the public water system and a system or equipment containing contaminants;

(7) Unprotected direct or indirect connection between the public water system and an auxiliary water system;

(8) A situation which presents an immediate health hazard to the public water system.

(c) *Water Service Termination Procedures.*

(1) For conditions (1)—(4), the city will terminate service to a customer's premises after two (2) written notices have been sent specifying the corrective action needed and the time period in which it must be done. If no action is taken within the allowed time period, water service may be terminated.

(2) For conditions (5)—(8), the city will take the following steps:

a. Make reasonable effort to advise water user of intent to terminate water service;

b. Terminate water supply and lock service valve. The water service will remain inactive until correction of violations have been approved by the city.

(Ord. No. 525, § 7, 7-18-94)

Chapter 4

PHASED WATER CONSERVATION PLAN

Sec. 12-4.01. Statement of policy and declaration of purpose.

Because of the water supply conditions prevailing in the area from which the city obtains all or a portion of its water supply, the general welfare requires that the water resources available to the city be put to the maximum beneficial use to the extent to which they are capable, and that the unreasonable use or unreasonable method of use of water be prevented and that the conservation of such water be practiced with a view to the reasonable and beneficial use thereof in the interest of the citizens of Lomita and for the public welfare. The purpose of this phased water conservation plan is to minimize the effect of a shortage of water supplies on the customers of the city water department during a water shortage emergency. (Ord. No. 481, § 1, 6-17-91)

Sec. 12.4.02. Authorization to implement water conservation.

(a) The city council may implement the applicable provisions of this conservation plan, following the public hearing required by subsection (b) of this section, upon its determination that such implementation is necessary to protect the public welfare and safety.

(b) The city council shall hold a public hearing for the purpose of determining whether a shortage exists in the city and which measures provided by this chapter should be implemented. Notice of the time and place of the public hearing shall be published not less than ten (10) days before the hearing in a newspaper of general circulation within the city or posted pursuant to Government Code section 36933 at the discretion of the city clerk.

(c) The city council shall issue its determination of shortage and corrective measures by resolution published in a daily newspaper circulated within the city or posted pursuant to Government Code section 36933 at the discretion of the city clerk. Any provisions requiring curtailment in the use of water shall become effective no sooner than the first full billing period commencing on or after the date of such publication. (Ord. No. 481, § 1, 6-17-91)

Sec. 12-4.03 General prohibition.

(a) No customer of the city water department shall make, cause, use or permit the use of water from the city water department in a manner contrary to any provision of this chapter. (Ord. No. 481, § 1, 6-17-91)

Sec. 12-4.04 Phase I shortage.

(a) A phase I shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a ten (10) percent shortage in its water supplies.

(b) No customer with a meter size one and one-half (1½) inches or larger shall make, cause or permit the use of an amount of water from the city water department for any purpose during

each billing period in excess of a target quantity of ninety (90) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of ninety (90) percent of the target quantity for that same billing period. (Ord. No. 481, § 1, 6-17-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.05. Phase II shortage.

(a) A phase II shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between ten (10) percent and fifteen (15) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of eighty-five (85) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of eighty-five (85) percent of the target quantity for the same billing period. (Ord. No. 481, § 1, 6-17-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.06. Phase III shortage.

(a) A phase III shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between fifteen (15) percent and twenty (20) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of eighty-five (85) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of eighty-five (85) percent of the target quantity for the same billing period. (Ord. No. 481, § 1, 6-17-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.06. Phase III shortage.

(a) A phase III shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between fifteen (15) percent and twenty (20) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of eighty (80) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of eighty (80) percent of the target quantity for that same billing period.

(d) The watering of lawns, landscapes or other turf area with water supplied by the city water department shall be limited to not more than every other day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

(e) New meters to provide construction water service shall not be issued.

(f) Water service letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the city determines that the mandatory rationing under the provisions of this chapter is no longer in effect or may be reduced to that required under sections 12-4.04 or 12-4.05 herein. (Ord. No. 481, § 1, 6-17-91; Ord. No. 484, § 1, 7-15-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.07. Phase IV shortage.

(a) A phase IV shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between twenty (20) percent and twenty-five (25) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of seventy-five (75) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of seventy-five (75) percent of the target quantity for the same billing period.

(d) The watering of lawns, landscapes or other turf area with water supplied by the city water department shall be limited to not more than every other day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

(e) New meters to provide construction water service shall not be issued.

(f) Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the city council determines that the mandatory rationing under the provisions of this chapter is no longer in effect or may be reduced to that required under section 12-4.04 or 12-4.05 herein. (Ord. No. 481, § 1, 6-17-91; Ord. No. 484, § 2, 7-15-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.08. Phase V shortage.

(a) A phase V shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between twenty-five (25) and thirty (30) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use of permit the use of a an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of seventy (70) percent. The target quantity shall be determined by the amount of water sued on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of seventy (70) percent of the target quantity for that same billing period.

(d) The watering of lawns, landscapes or other turf area with water supplied by the city water department shall be limited to not more than every other day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

(e) New meters to provide construction water service shall not be issued.

(f) Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the city council determines that the mandatory rationing under the provisions of this chapter is no longer in effect or may be reduced to that required under sections 12-4.04 or 12-4.05 herein. (Ord. No. 481, § 1, 6-17-91; Ord. No. 484, § 2, 7-15-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.09. Phase VI shortage.

(a) A phase VI shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between thirty (30) and thirty-five (35) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of sixty-five (65) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of sixty-five (65) percent of the target quantity for that same billing period.

(d) The watering of lawns, landscapes or other turf area with water supplied by the city water department shall be limited to not more than every third day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

(e) New meters to provide construction water service shall not be issued.

(f) Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the city council determines that the mandatory rationing under the provisions of this chapter is no longer in effect or may be reduced to that required under sections 12-4.04 or 12-4.05 herein. (Ord. No. 481, § 1, 6-17-91; Ord. No. 484, § 2, 7-15-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.10. Phase VII shortage.

(a) A phase VII shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between thirty-five (35) and forty (40) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of sixty (60) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of sixty (60) percent of the target quantity for that same billing period.

(d) The watering of lawns, landscapes or other turf area with water supplied by the city water department shall be prohibited, except that trees and shrubs may be watered at any time by bucket.

(e) All meters to provide construction water shall be removed.

(f) Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the city council determines that the mandatory rationing under the provisions of this chapter is not longer in effect or may be reduced to that required under sections 12-4.04 or 12-4.05.

(g) No new permanent meters shall be installed. (Ord. No. 481, § 1, 6-17-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.11. Phase VIII shortage.

(a) A phase VIII shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between forty (40) and forty-five (45) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of forty-five (45) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of fifty-five (55) percent of the target quantity for that same billing period

(d) The watering of lawns, landscapes or other turf area with water supplied by the city water department shall be prohibited, except that trees and shrubs may be watered at any time by bucket.

(e) All meters to provide construction water shall be removed.

(f) Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the city council determines that the mandatory rationing under the provisions of this chapter is no longer in effect or may be reduced to that required under section 12-4.04 or 12-4.05 herein.

(g) Issuance of permanent metered service to all new lots shall be prohibited until mandatory rationing is no longer in effect. (Ord. No. 481, § 1, 6-17-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.12. Phase IX shortage.

(a) A phase IX shortage shall be declared whenever the city council determines that it is likely that the city water department will suffer a shortage of between forty-five (45) and fifty (50) percent in its water supplies.

(b) No customer with a meter size of one and one-half (1½) inches or larger shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of a target quantity of fifty (50) percent. The target quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the city council.

(c) For meter sizes of one (1) inch or less, a target quantity shall be computed and will be the larger of the following amounts:

(1) The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the city council; or

(2) The amount of water used on the customer's premises during the corresponding billing period to be defined by the city council.

No customer with a meter size of one (1) inch or less shall make, cause, use or permit the use of an amount of water from the city water department for any purpose during each billing period in excess of fifty (50) percent of the target quantity for that same billing period.

(d) The watering of lawns, landscapes or other turf area, including trees and shrubs, with water supplied by the city water department shall be prohibited.

(e) All meters to provide construction water shall be removed.

(f) Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the board of directors determines that the mandatory rationing under the provisions of this chapter is no longer in effect or may be reduced to that required under section 12-4.04 or 12-4.05 herein.

(g) Issuance of permanent metered service to all new lots shall be prohibited until mandatory rationing is no longer in effect. (Ord. No. 481, § 1, 6-17-91; Ord. No. 487, § I, 9-3-91)

Sec. 12-4.13. Relief from compliance.

(a) A customer may file an application for relief from any provision of this chapter. A water conservation appeals board ("board") shall be appointed by the city council to review, administer and grant such relief, which board shall be made up of residents of the City of Lomita who shall serve for two-year terms. The number of board members and operating panels of said board shall be at the discretion of the city council. The city administrator or his

or his or her designee shall serve as an ex officio, nonvoting member of the board and of each operating panel of the board.

(b) The application for relief may include a request that the customer be relieved, in whole or in part, from the water use curtailment of any provision or provisions herein.

(c) In determining whether to grant relief, and the nature of any relief, the board shall take into consideration all relevant factors, including but not limited to:

(1) Whether any additional reduction in water consumption will result in unemployment;

(2) Whether additional members have been added to the household;

(3) Whether additional landscape property had been added to the property since the corresponding billing period of the base year;

(4) Changes in vacancy factors in multifamily housing;

(5) Increased number of employees in commercial, industrial and governmental offices;

(6) Increased production requiring increased process water;

(7) Water used during new construction;

(8) Adjustments to water use caused by emergency health or safety hazards;

(9) First filling of a permit-constructed swimming pool; and

(10) Water use necessary for reasons related to family health.

(d) In order to be considered, an application for relief must be filed with the city water department within twenty (20) days from the date of receipt of a water bill or other notice which establishes the adverse impact of this chapter on applicant. No relief shall be granted unless the customer shows that he or she has achieved the maximum practical reduction in water consumption other than in the specific areas in which relief is being sought. No relief shall be granted to any customer who, when requested by the board, fails to provide any information necessary for resolution of the customer's application for relief. The board's decision shall be issued within twenty (20) days and provided to the customer. (Ord. No. 481, § 1, 6-17-91; Ord. No. 486, § I, 9-3-91; Ord. No. 489, § I, 11-4-91)

Sec. 12-4.14. Notification of customers and banking of water usage credits.

(a) Each customer will be notified on his or her bill as to what the target quantity for water usage will be for the applicable billing period and any earned credits as provided in this section.

(b) If a customer uses less than the target quantity in any given month in which a phased water conservation plan is in force, the difference between the target quantity and the amount actually used by the customer will be deemed water usage credits. One (1) water usage credit will be earned for each full cubic foot of water below the target quantity of water that is used by the customer.

(c) Earned water usage credits will continue to accrue from month to month, for as long as the city remains in a continuous phased water conservation plan, until the customer uses more than the target quantity of water specified by the phased water conservation plan. At that time, before the city imposes the penalties specified in section 12-4.15, the city will subtract the accrued water usage credits from the excess usage of that particular month. If the water usage credits exceed the excess usage for that month, then the city will not impose the section 12-4.15 penalties on the customer. Any water usage credits that exceed the excess usage for that month will be rolled over to be used at a future date for as long as the city remains in a continuous phased water conservation plan. If the water usage credits are less than the excess usage amount for that month, then the city will impose penalties based on the difference between the accrued water usage credits and the excess usage for that particular month. (Ord. No. 481, § 1, 6-17-91; Ord. No. 500, § 2, 8-3-92)

Sec. 12-4.15. Failure to comply.

(a) Any customer receiving notice of a third or subsequent violation of the water use prohibitions of section 12-4.06(d), 12-4.07(d), 12-4.08(d), 12-4.09(d), 12-4.10(d), 12-4.11(d), or 12-4.12(d) shall have the right to a hearing by the city administrator or his designee within fifteen (15) days of a mailing or other delivery of the notice of violation.

(b) Violation by any customer of the water use prohibitions of sections 12-406(d), 12-4.07(d), 12-4.08(d), 12-4.09(d), 12-4.10(d), 12-4.11(d) and 12-4.12(d) shall be penalized as follows:

(1) *First violation.* The city administrator or designee shall issue a written notice of the fact of a first violation to the customer.

(2) *Second violation.* For a second violation during any one (1) water shortage emergency, the city administrator or designee shall issue a written notice of the fact of a second violation to the customer.

(3) *Third and subsequent violations.* For a third and each subsequent violation during any one (1) water shortage emergency, the city administrator or designee shall install a flow-restricting device on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight (48) hours. The city administrator shall charge the customer the reasonable costs incurred for installing and for removing the flow-restricting devices and for restoration of normal service. The charge shall be paid before normal service can be restored.

(c) All moneys collected by the city water department pursuant to this chapter shall be deposited in that city's general fund as reimbursement for the costs and expenses of administering this conservation plan.

(d) The city shall give notice of violation to the customer committing the violation as follows:

(1) Notice of violation of the water use curtailment provisions of sections 12-4.04(b), 12-4.04(c), 12-4.05(b), 12-4.05(c), 12-4.06(b), 12-4.06(c), 12-4.07(b), 12-4.07(c), 12-4.08(b), 12-4.08(c), 12-4.09(b), 12-4.09(c), 12-4.10(b), 12-4.10(c), 12-4.11(b), 12-4.11(c), 12-4.12(b) and 12-4.12(c) or of first and second violations of the water use prohibitions of sections 12-4.06(d), 12-4.07(d), 12-4.08(d), 12-4.09(d), 12-4.10(d), 12-4.11(d), and 12-4.12(d), shall be given to the customer in person or by regular mail.

(2) Notice of third or subsequent violations of the water use prohibitions of sections 12-4.06(d), 12-4.07(d), 12-4.08(d), 12-4.09(d), 12-4.10(d), 12-4.11(d), and 12-4.12(d) shall be given in writing in the following manner:

a. By giving notice to the customer personally at both the billing and service addresses;

b. 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

c. 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.

(e) The notice shall contain a description of the facts of the violation, a statement of the possible penalties for each violation, and a statement informing the customer of his right to a

hearing on the merits of the violation pursuant to section 12-4.16 (Ord. No. 481, § 1, 6-17-91; Ord. No. 484, §§ 3—5, 7-15-91)

Sec. 12-4.16. Hearing regarding violations.

(a) Any customer receiving notice of a third or subsequent violations of the water use prohibitions of section 12-4.07(d), 12-4.08(d), 12-4.09(d), 12-4.10(d), 12-4.11(d) or 12-4-12(d) shall have a right to a hearing by the city administrator or his designee within fifteen (15) days of a mailing or other delivery of the notice of violation.

(b) The customer's written request for a hearing must be received within ten (10) days of the issuance of the notice of violation. This request shall stay installation of a flow-restricting device on the customer's premises and the imposition of any surcharge until the city administrator or designee renders his or her decision. The decision shall be issued within ten (10) days of the hearing, a copy of which shall be provided to the customer.

(c) The decision of the Director of Public Works shall be final except for judicial review. (Ord. No. 481, § 1, 6-17-91)

Sec. 12-4.17. Additional water shortage measures.

The city council may order implementation for water conservation measures in addition to those set forth in sections 12-4.04, 12-4.05, 12-4.06, 12-4.07, 12-4.08, 12-4.09, 12-4.10, 12-4.11 and 12-4.12. (Ord. No. 481, § 1, 6-17-91)

Sec. 12-4.18 Public health and safety not to be affected.

Nothing in this chapter 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. (Ord. No. 481, § 1, 6-17-91)

[The next page is 1567]

Appendix H: MWD 2010 RUWMP Sections II & IV

City of Lomita 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

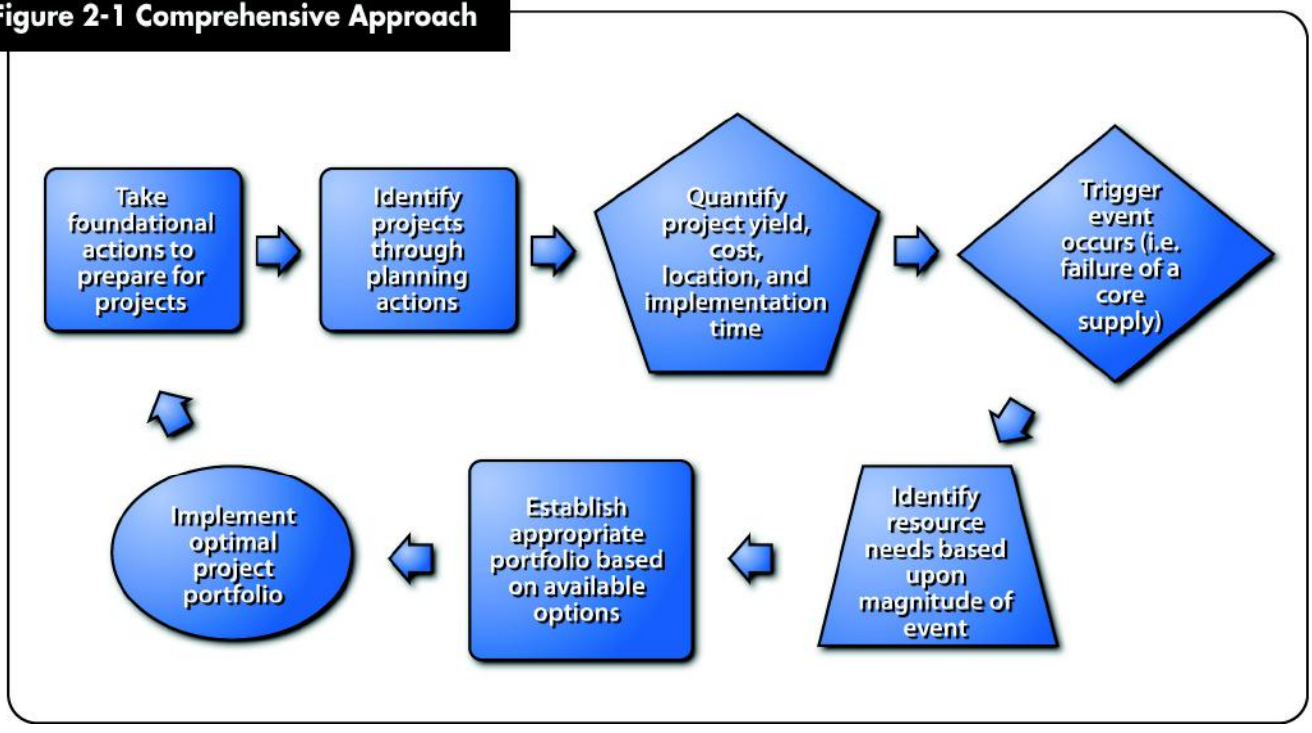

Table 2-2
Stormwater Issue Categories and Implementation Elements

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

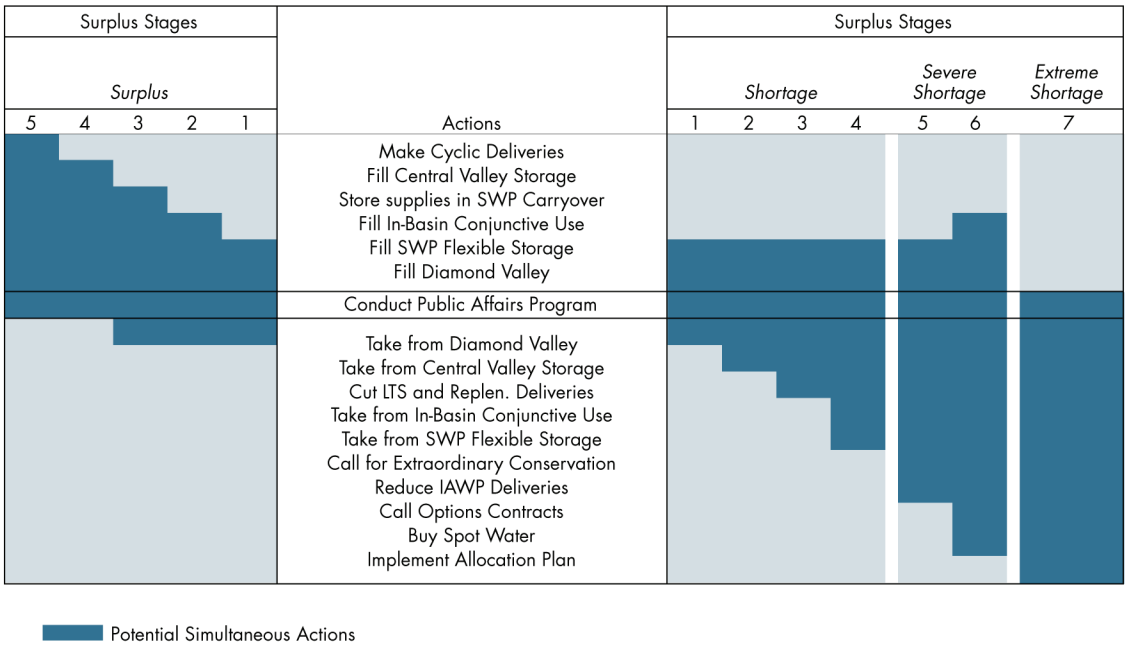

Table 2-12
Schedule of Reporting and Resource Allocation Decision-Making

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.'

Knowledge Sharing and Research Support

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

Quantification of Current Research

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.

This page intentionally left blank.

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

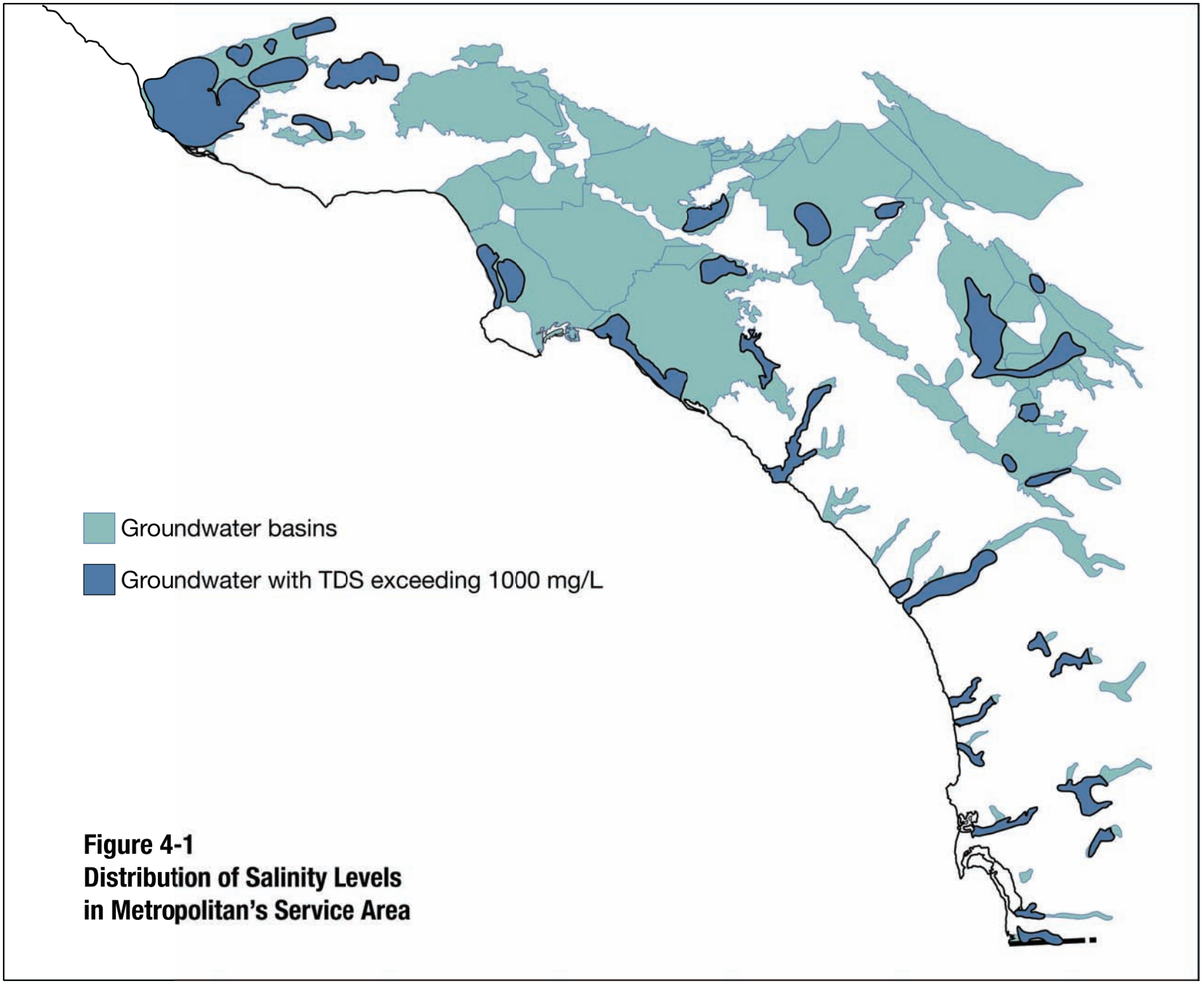

Figure 4-1
Distribution of Salinity Levels in Metropolitan's Service Area

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

[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.