Los Angeles Department of Water & Power

URBAN WATER

MANAGEMENT PLAN

2015

RESOLUTION NO. 016 285

WHEREAS, the California Urban Water Management Planning Act requires California water suppliers to prepare and adopt an Urban Water Management Plan every five years that describes their historical and future efforts in the area of water resource planning and supply; and

WHEREAS, the Los Angeles Department of Water and Power (LADWP) has prepared an update to the City of Los Angeles' Urban Water Management Plan (UWMP) pursuant to applicable provisions of Sections 10610 through 10656 of the California Water Code; and

WHEREAS, the UWMP is required as a condition of application eligibility for various water system grant and loan funding opportunities administered by the State of California; and

WHEREAS, LADWP selects Method 3 of the four methods developed by the California Department of Water Resources for calculating the 2020 water use target and 2015 interim target in the UWMP as required in the California Water Conservation Act of 2009, Senate Bill X7-7; and

WHEREAS, LADWP's current water rates include funding for the local supply programs described in the UWMP; and

WHEREAS, the UWMP has incorporated the Mayors Sustainable City pLAn goals to achieve up to 25 percent reduction in gallons per capita per day (gpcd) by 2035, 50 percent reduction of imported purchase water by 2025, and expand all local sources of water so that they account for at least 50 percent of the total supply by 2035; and

WHEREAS, the UWMP identifies current and planned supplies to meet all demands over the 25 year planning period under average, single-dry, and multi-dry year hydrology; and

WHEREAS, the UWMP identifies phases or actions to respond with up to 50 percent reduction in water supply as described in the City's Emergency Water Conservation Plan; and

WHEREAS, the development of the UWMP involved public meeting notices, public involvement, and incorporated oral and written public comments prior to final adoption; and

WHEREAS, the final UWMP must be adopted by the LADWP's Board of Water and Power Commissioners and submitted to the California Department of Water Resources by July 1, 2016.

NOW, THEREFORE, BE IT RESOLVED, that the City of Los Angeles Department of Water and Power's 2015 Urban Water Management Plan is hereby adopted; and

BE IT FURTHER RESOLVED that the President or Vice President, or the General Manager, or such person as the General Manager shall designate in writing, and the Secretary, Assistant Secretary, or the Acting Secretary of the Board are hereby authorized and directed to execute said plan on behalf of LADWP.

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of a Resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held JUN 07 2016

Barbara E. Moschos

Secretary

APPROVED AS TO FORM AND LEGALITY
MICHAEL N. FEUER, CITY ATTORNEY

APR 27 2016

BY
DAVID EDWARDS
DEPUTY CITY ATTORNEY

Urban Water Management Plan

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Note: The 2015 Urban Water Management Plan for the Los Angeles Department of Water and Power (LADWP) is available to the public at the Los Angeles City Public Library, County of Los Angeles Public Library, West Hollywood Library, Culver City Library, California State Library, and the LADWP website at www.ladwp.com/uwmp

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Glossary of Abbreviations and Terms

Agencies

AVEK	Antelope Valley-East Kern Water Agency
AWWA	American Water Works Association
BOE	City of Los Angeles Department of Public Works, Bureau of Engineering
LASAN	City of Los Angeles Department of Public Works, Bureau of Sanitation
Caltrans	California Department of Transportation
CBWRP	Central Basin Water Rights Panel
CDFG	California Department of Fish and Game
CDPH	California Department of Public Health
CITY	City of Los Angeles
CRB	Colorado River Board of California
CUWCC	California Urban Water Conservation Council
CVWD	Coachella Valley Water District
DDW	State Water Resources Control Board Division of Drinking Water
DOE	U.S. Department of Energy
DOF	California Department of Finance
DTSC	California Department of Toxic Substance Control
DWA	Desert Water Agency
DWR	California Department of Water Resources
GBUAPCD	Great Basin Unified Air Pollution Control District
GSAs	Groundwater Sustainability Agencies
IAPMO	International Association of Plumbing and Mechanical Officials
IID	Imperial Irrigation District
KERN-DELTA	Kern Delta Water District
LACDPH	Los Angeles County Department of Public Health
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LADBS	Los Angeles Department of Building and Safety
LADWP	Los Angeles Department of Water and Power
LARWQCB	Los Angeles Regional Water Quality Control Board
LBWD	Long Beach Water Department
MWD	Metropolitan Water District of Southern California

NWRI	National Water Research Institute
OVC	Owens Valley Committee
PG&E	Pacific Gas and Electric
PVID	Palo Verde Irrigation District
RWAG	Recycled Water Advisory Group
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SDCWA	San Diego County Water Authority
SLC	California State Lands Commission
SRCSD	Sacramento Regional County Sanitation District
SWRCB	State Water Resources Control Board
SWSD	Semitropic Water Storage District
UCLA	University of California, Los Angeles
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
WBMWD	West Basin Municipal Water District
WRD	Water Replenishment District

Facilities and Locations

AVGB	Antelope Valley Groundwater Basin
AWPF	Advanced Water Purification Facility
AWTF	Advanced Water Treatment Facility
BAY-DELTA	San Francisco Bay and Sacramento-San Joaquin River Delta
BOU	Burbank Operable Unit
BWRP	Burbank Water Reclamation Plant
CRA	Colorado River Aqueduct
DCTWRP	Donald C. Tillman Water Reclamation Plant
ECLWRF	Edward C. Little Water Recycling Facility
EOC	Emergency Operations Center
HWRP	Hyperion Water Reclamation Plant
JWPCP	Joint Water Pollution Control Plant
LAA	Los Angeles Aqueducts (First and Second)
LAAFP	Los Angeles Aqueduct Filtration Plant
LAGWRP	Los Angeles/Glendale Water Reclamation Plant
LAWA	Los Angeles World Airports
LVMWD	Las Virgenes Municipal Water District
NHOU	North Hollywood Operable Unit
NTPS	Neenach Temporary Pumping Station
RWMP	Recycled Water Master Plan
SFB	San Fernando Basin
SWP	State Water Project
TIWRP	Terminal Island Water Reclamation Plant
TWRP	Tapia Water Reclamation Plant

ULARA	Upper Los Angeles River Area

Measurements and Miscellaneous

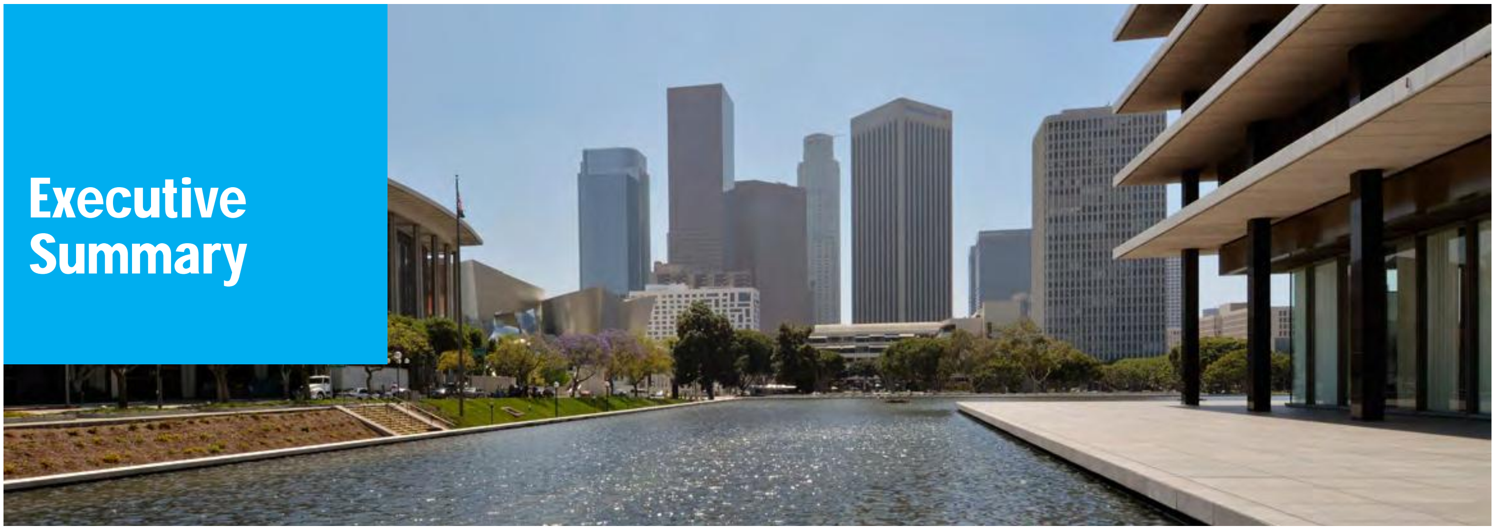
AOP	Advanced Oxidation Process
ARRP	American Recovery and Reinvestment Act
AB	Assembly Bill
ACT	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet Per Year
BDCP	Bay Delta Conservation Plan
BMP	Best Management Practices
BOARD	Board of Water and Power Commissioners
BOD	Biochemical Oxygen Demand
CAP	Central Arizona Project
CBO	Community-Based Organizations
CEQA	California Environmental Quality Act
CFS	Cubic Feet Per Second
CII	Commercial/Industrial/Institutional
CMIP	Coupled Model Intercomparison Project
COC	Cycles of Concentration
COCs	Chemicals of Concern
CRSS	Colorado River Simulation System
CVP	Central Valley Project
CWC	California Water Code
DBP	Disinfection Byproduct
DPR	Direct Potable Reuse
ED5	Mayor’s Executive Directive 5
EIR	Environmental Impact Report
EO	Executive Order
ERP	Emergency Response Plan
ESA	California Endangered Species Act
ETAF	Evapotranspiration Adjustment Factor
ETo	Evapotranspiration Rate
ETWU	Estimated Total Water Use
EWMP	Enhanced Watershed Management Program
FLAA	First Los Angeles Aqueduct
Forum	Colorado River Basin Salinity Control Forum
FTC	Flow To City
FY	Fiscal Year (July to June)
FYE	Fiscal Year Ending
GAC	Granular Activated Carbon
GCM	Global Climate Models
GDAP	Groundwater Development and Augmentation Plan

GHG	Greenhouse Gases
GLAC	Greater Los Angeles County
GPCD	Gallons Per Capita Per Day
GPD	Gallons Per Day
GPF	Gallons Per Flush
GPM	Gallons Per Minute
GSIS	Groundwater System Improvement Study
GSPs	Groundwater Sustainability Plans
GWAM	Groundwater Augmentation Model
GWR	Groundwater Replenishment
HCSM	Hydrogeologic Conceptual Site Model
HEIP	High Energy Improvement Program
HET	High Efficiency Toilets
HSPF	Hydrologic Simulation Program-Fortran
IAP	Independent Advisory Panel
IPCC	Intergovernmental Panel on Climate Change
IPR	Indirect Potable Reuse
IRP	Integrated Resources Plan
IRWMP	Integrated Regional Water Management Plan
KWh/AF	Kilowatt-Hour per Acre-Foot
LAASM	Los Angeles Aqueduct Simulation Model
LID	Low Impact Development
LORP	Lower Owens River Project
LRP	Local Resources Program
LSPC	Load Simulation Program
M&I	Municipal and Industrial
MAF	Million Acre-Feet
MAWA	Maximum Applied Water Allowance
MCL	Maximum Contaminant Level
MF/RO	Microfiltration/Reverse Osmosis
MGD	Million Gallons Per Day
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
MWIP	Manhattan Wellfield Improvement Project
MWELO	Model Water Efficient Landscape Ordinance
NDMA	N-nitrosodimethlamine
NdN	Nitrification/Denitrification
NPDES	National Pollutant Discharge Elimination System
NPR	Non-Potable Water Reuse
PCE	Perchloroethylene
pLAn	LA's Sustainable City Plan
PPB	Parts Per Billion
PPCPs	Pharmaceuticals and Personal Care Products
PPM	Parts Per Million

QSA	Quantification Settlement Agreement
RFP	Request for Proposal
RI	Remedial Investigation
RCP	Representative Concentration Pathway
RO	Reverse Osmosis
RTP	Southern California Association of Governments Regional Transportation Plan
RWMP	Recycled Water Master Plan
RWL	Receiving Water Limitations
RY	Runoff Year (April to March)
S2DBPR	Stage 2 Disinfection Byproducts Rule
SB	Senate Bills
SEF	Stream Ecosystem Flow
SGMA	Sustainable Groundwater Management Act
SIP	State Implementation Plan
SLAA	Second Los Angeles Aqueduct
SCMP	Stormwater Capture Master Plan
SGM	Sustainable Groundwater Management
SGFs	Sewer Generation Factors
SWAT	Irrigation Association Smart Water Application Technologies
SWE	Snow Water Equivalent
TAF	Thousand Acre-Feet
TAP	Technical Assistance Program
TCE	Trichloroethylene
TDMLs	Total Maximum Daily Loads
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TwB2	Tillage with Best Available Control Measure Backup
ULF	Ultra-Low Flush
UV	Ultra-Violet
UWMP	Urban Water Management Plan
VIC	Variable Infiltration Capacity
VOCs	Volatile Organic Compounds
WAS	Los Angeles Basin Water Augmentation Study
WBICs	Weather-Based Irrigation Controllers
WCPS	Water Conservation Potential Study
WCRP	World Climate Research Program
WMP	Watershed Management Program
WSDMP	Water Supply Drought Management Plan
WQBELs	Water Quality Based Effluent Limits
WQCMPUR	Water Quality Compliance Master Plan for Urban Runoff
WRR	Water Recycling Requirements
WSA	Water Supply Assessment
WSAP	Metropolitan Water District's Water Supply Allocation Plan

WSDM	Water Surplus and Drought Management Plan
WSS	Water Sense Specification
WY	Water Year (October to September)
20x2020	Reduce Per Capita Water Use by 20 Percent by 2020; Senate Bill x7-7

Executive Summary



ES-1 Overview and Purpose of Plan

In 1902, the City of Los Angeles (City) created a municipal water system by acquiring title to all properties of a private water company. In 1925, the Los Angeles Department of Water and Power (LADWP) was established by a new city charter. The availability of water has been essential to the economic development of the City, growing from a town with a population of approximately 146,000 in 1902 to the nation's second largest city with nearly 4 million people. As the largest municipal utility in the nation, LADWP delivers safe and reliable water service to over 675,000 active service connections.

Overview of Water Issues and Challenges

Faced with increasing demands for additional water supplies and drought conditions, LADWP and other water agencies in Southern California are addressing the challenge of providing a reliable water supply to a growing population. LADWP has a long history of working to ensure that its customers have reliable water. Since the completion of the prior Urban Water Management Plan (UWMP), the water supply situation has changed dramatically. Front and center is a multi-year drought that has precipitated several sustainability initiatives at the state level and within the City. These actions include calls to decrease water use by up to 25% per capita over the next 20 years, reduce dependence on imported water supplies, and accelerate the development of local supplies. Plans outlined herein are not only designed to ensure future water reliability for Los Angeles, but also comply with these sustainability policies and initiatives.

LADWP Responses

LADWP plans to address current and future drought conditions and the relevant State and City initiatives with the following responses:

- Achieving significant advances in water conservation, stormwater capture, and water recycling to increase supply reliability, reduce imported water purchases, and increase locally produced water.
- Remediating the contamination of the San Fernando Groundwater Basin.
- Ensuring continued reliability of the water supplies from the Metropolitan Water District of Southern California (MWD) through active representation on the MWD Board.
- Maintaining operational integrity of the Los Angeles Aqueduct and the City's water distribution systems.
- Meeting or exceeding all federal and state standards for drinking water quality.

Purpose of Plan

The California Urban Water Management Planning Act (Act-effective January 1, 1984) requires that every urban water supplier prepare and adopt an UWMP every five years. The main objective of producing these plans is to confirm that cities are performing the advance planning necessary to provide reliable water service in the future. Specifically, the UWMP forecasts future water demands and water supplies under average and dry year conditions; identifies future water supply projects such as recycled water; provides a summary of water conservation Best Management Practices (BMPs); and provides a single and multi-dry year management strategy.

The LADWP's 2015 UWMP presents the basic policy principles that guide LADWP's decision-making process to secure a sustainable water supply for Los Angeles. The UWMP serves two purposes:

- It is a master plan for water supply and resources management consistent with the City's goals and policy objectives; and
- It provides full compliance with the requirements of the ACT.

Specific Policy Responses to a Multi-Year Drought

A number of important changes have occurred since LADWP prepared its 2010 UWMP:

- The year 2012 marked the start of the current multi-year drought, resulting in Governor Brown proclaiming a drought state of emergency in 2014;
- In July 2014, the State Water Resources Control Board (SWRCB) implemented its Emergency Water Conservation Regulation (Emergency Regulation) as directed by Governor Brown to take actions to reduce water use by 20 percent Statewide;
- In October 2014, Mayor Eric Garcetti issued Executive Directive No. 5 (ED5) Emergency Drought Response which set goals to reduce per capita water use, reduce purchases of imported potable water by 50%, and create an integrated water strategy to increase local supplies and improve water security considering climate change and seismic vulnerability;
- In March 2015, the Emergency Regulation was expanded requiring urban water supplies to implement their water shortage contingency plans to a level equivalent to a 20 percent water use reduction;
- In April 2015, Sustainable City pLAn was released establishing short-term and long-term targets for the City over the next 20 years in 14 categories to strengthen and promote sustainability of the environment, economy, and equity in Los Angeles. A multi-faceted approach to developing a locally sustainable water supply was developed through pLAn calling for short-term, mid-term, and long-term goals reducing reliance on imported water, reducing per capita water use through conservation, and increasing local water supply availability;
- In May 2015, as the drought worsened, Emergency Regulation was further amended to mandate conservation targets for urban water suppliers to achieve a mandatory 25 percent water use reduction statewide from June 2015 through February 2016;
- In February 2016, the requirements of the May 2015 Emergency Regulation was extended to October 2016 with adjustments to account for climate affecting different parts of the state, growth experienced by urban areas, and significant investments that have been made to create new, local, drought-resilient sources of potable water supply.

Changes to the UWMP Act Since 2010

New requirements have been added to UWMP Act since completion of the 2010 UWMP, including:

- Extension of the submittal from December 31, 2015 to July 1, 2016;
- A requirement for a narrative description of water demand measures implemented over the past five years and future measures planned to meet 20 percent demand reduction targets by 2020;
- Implementation of a standard methodology for calculating system water loss;
- Mandatory electronic filing of UWMPs;
- Voluntary reporting of passive conservation savings, energy intensity, and climate change; and
- Requirement to analyze and define water features that are artificially supplied with water.

ES-2 Existing Water Supplies

Primary sources of water for the LADWP service area are the Los Angeles Aqueducts (LAA), local groundwater, State Water Project (supplied by MWD), and Colorado River Aqueduct (supplied by MWD). Exhibit ES-A indicates the general location of these supplies. An additional water source, recycled water, is becoming a larger part of the overall supply portfolio. Water supplies from the LAA, State Water Project, and Colorado River Aqueduct are classified as imported because they are obtained from outside LADWP's service area.

Many of LADWP's traditional water sources are being negatively impacted by climate extremes, environmental regulations, and groundwater basin contamination. These issues, and the appropriate responses, are explicitly addressed in this UWMP, including plans to reduce dependence on purchased imported water from MWD. However, it is important to note that it is in LADWP's best interest to protect all of its existing water supplies. Pressure on one supply resource, such as the recent minimal snowfall in the Eastern Sierra Nevada Mountains affecting the LAA supply, means that other supplies must make up the difference, for example groundwater and/or purchased water from MWD.

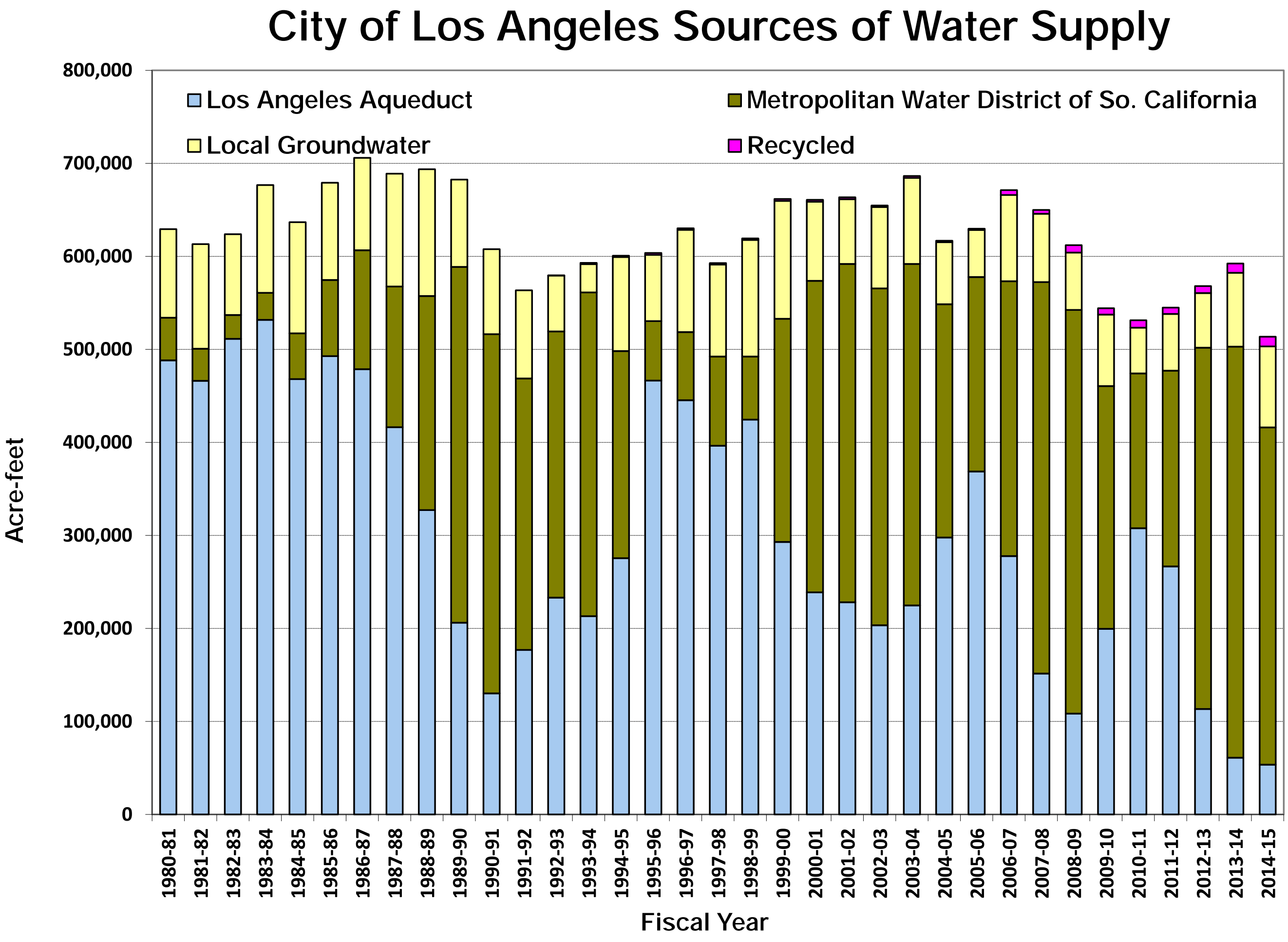
Exhibit ES-A
Main Sources of LADWP's Water Supply

Exhibit ES-B summarizes the historical water supplies from 1980 to 2015. Over the last ten years, demands have undergone a drastic reduction from a peak of 670,970 Acre Feet per Year (AFY) in Fiscal Year (FY) 2006/07. This is because several periods of drought have precipitated increased conservation. Most recently, the multi-year drought beginning in 2012 caused diminished supplies from the LAA, leading to heavy reliance on purchased MWD water. This drove conservation efforts that resulted in a 22 percent reduction in demand in 2014/15, as compared to 2006/07. Reliance on MWD reached a peak in FY 13/14 as a result of limitations on the LAA supply.

Recycled Water

As early as 1960, the City recognized the potential for water recycling and began investing in infrastructure that produces water of tertiary quality, a much higher treatment standard than normal wastewater treatment. In 1979, LADWP began delivering recycled water to the Department of Recreation and Parks for irrigation of various areas in Griffith Park. Today LADWP serves approximately 48 locations in the City with recycled water for irrigation, industrial, and environmental uses. There are approximately 200 customer service accounts. Total recycled water produced for FY 2014/15 was 36,738 AFY. All recycled water used within the

Exhibit ES-B
LADWP Historical Water Supply from FY 1980/81 to 2014/15



City undergoes, at a minimum, tertiary treatment and disinfection. This water is designed to meet the needs of the application, and meets or exceeds local and state requirements designed to ensure public safety.

Los Angeles Aqueduct

Since its construction in the early 1900's, the LAA has provided the vast majority of water for the City. Annual LAA deliveries are dependent on snowfall in the Eastern Sierra Nevada Mountains. Years with abundant snowpack result in larger water deliveries from the LAA, and typically reduced purchases of supplemental water from MWD. Conversely, low LAA deliveries in dry years increase the amount of water LADWP must purchase from MWD. The impact to LAA water supplies due to varying hydrology in the Eastern Sierra Nevada is exacerbated by requirements to release water for environmental enhancement projects in the Mono Basin and Owens Valley.

The cyclical nature of this hydrology in the Eastern Sierra Nevada Mountains is demonstrated by LAA deliveries over the last fifteen years. This period was characterized by a series of wet years, followed by a series of dry years that have extended into the current drought period. The current drought that began in 2012 has impacted the entire State of California. LAA deliveries reached a record low of 53,500 AF during FY 2014/15. From FY 2010/11 through 2014/15, LAA deliveries supplied an average of 29 percent of the City's water needs, which is substantially lower than long-term average. In the last decade, the City has been required to reallocate approximately 182,000 AFY of LAA water supply to environmental mitigation and enhancement projects leaving approximately 43 percent of the supply available for export to the City. Complying with environmental requirements, coupled with the drought, has led to increased dependence on imported water from MWD. This increased dependence has reinforced the need for LADWP to accelerate development of local supplies.

Local Groundwater

A key water supply for the City is local groundwater, the primary resource being the San Fernando Groundwater Basin. Groundwater basins are tremendous water reliability assets. They store water in wet years through natural replenishment, and can provide water utilities the opportunity to store additional water using purified recycled water, or by proactively increasing stormwater capture. The ability to store water is the key to water reliability in the Southwest, and stored groundwater can be used during dry years when others supplies are less available.

Over the last five years groundwater has provided approximately 12 percent of the total water supply for Los Angeles, and since 1970 has provided up to 23 percent of supply during extended dry periods. Unfortunately, groundwater contamination has impacted LADWP's ability to fully utilize its entitlements, especially over the last 10 years. Furthermore, expanding urbanization, increasing impervious hardscape, and channelization of stormwater runoff have reduced natural replenishment. Aging well fields and distribution infrastructure have also inhibited the full utilization of the City's groundwater resources.

In response to these issues, LADWP has renewed its focus on protecting and rehabilitating its local groundwater basins, including expanding the remediation efforts for the San Fernando Basin (SFB). LADWP continues to invest in stormwater recharge projects by enhancing and enlarging existing stormwater capture facilities. LADWP is also investing in advanced treatment systems to produce purified recycled water for groundwater replenishment, often referred to as indirect potable reuse. These investments will augment the City's groundwater and help ensure that basin water levels remain sustainable for the foreseeable future.

MWD Supply

As a wholesaler, MWD sells water to 26 member agencies in Southern California. LADWP is exclusively a retailer, selling water to individual residents and businesses. LADWP typically purchases MWD water to make up the deficit between demand and the availability of other City supplies. As a percentage of the City's total water supply, purchases from MWD have historically varied from 4 percent in FY 1983/84 to 75 percent in FY 2013/14, with a 5-year average of 57 percent from FY 2010/11 to 2014/15. The City relies heavily on MWD in dry years. This reliance has increased in recent years as the LAA supply has been impacted by extended drought and increased demand for water to protect the environment in the Mono Basin and Owens Valley. However, by 2025 the Sustainable City pLAn calls for a reduction in dependence on purchased imported water by 50 percent from FY 2013/14 levels. Although LADWP plans to reduce this reliance on MWD, it has made significant investments to ensure that this important supplemental supply is available when the City's LAA supply is reduced during droughts.

ES-3 Water Demand Drivers and Forecasting

Water demands are driven by a number of factors:

- Demographics – population, number of single-family homes, and number of employees
- Socioeconomics – price of water, personal income, family size, economy, drought conservation effect, and passive water conservation
- Conservation – passive conservation from plumbing codes and landscape ordinances, passive conservation from behavioral changes, and active conservation from the City's various active conservation programs
- Weather – historical weather patterns including daily maximum temperature and precipitation
- Non-Revenue Water – the difference between total water consumption and billed water use

For the development of LADWP's 2015 UWMP, a new water demand forecast was prepared for the major categories of demand. This forecast will allow the City to better understand water-use trends and develop effective conservation programs.

Demographics and Economic Conditions

Nearly 4 million people reside in the LADWP service area, which is slightly larger than the legal boundary of the City of Los Angeles. LADWP provides water service outside the City's boundary to portions of West Hollywood, Culver City, Universal City, and small parts of the County of Los Angeles. The population within LADWP's service area increased from 2.97 million in 1980 to 3.99 million in 2015, an average annual growth rate of approximately 1 percent. The total number of housing units increased from 1.10 million in 1980 to 1.39 million in 2015, an average annual growth rate of 0.8 percent. During this time, average household size increased from 2.70 persons in 1980 to 2.77 persons in 2015. Employment grew by about 0.7 percent annually from 1980 to 1990, but declined from 1990 to 2010 as a result of two economic recessions. The first recession began in 1991 and was followed by a larger recession beginning in 2008. Only recently has employment begun to return to levels experienced in 1990. Overall, employment decreased by about 0.3 percent annually from 1990 to 2010, and between 2010 and 2015 increased by approximately 1.4 percent, reflecting the recovery from the 2008 recession.

Demographic projections were provided for the LADWP service area by MWD, who received the data from Southern California Association of Governments (SCAG). SCAG applied its 2012 Regional Transportation Plan demographic data to water service areas for MWD's member agencies. This data was used for water demand projections in the UWMP. Exhibit ES-C summarizes these demographic projections for the LADWP service area. Service area population is expected to continue to grow over the next 25 years at a rate of 0.5 percent annually. While this is substantially less than the historical 1.0 percent annual growth rate from 1980 to 2010, it will still lead to approximately 493,200 new residents over the next 25 years.

Mediterranean Climate

Weather in Los Angeles is considered mild, which is a major attribute that attracts businesses, residents, and tourists to the City. It also significantly impacts water demand, especially the need for irrigating landscapes. Because of its relative dryness, Los Angeles' climate has been characterized as Mediterranean. Exhibit ES-D provides a summary of average monthly rainfall, maximum temperatures, and evapotranspiration (Eto) readings.

Exhibit ES-C
Demographic Projections for the LADWP Service Area

Demographic	2020	2025	2030	2035	2040
Population	4,026,891	4,168,131	4,210,042	4,351,408	4,441,545
Housing					
Single-Family	650,746	635,348	652,379	675,540	682,412
Multi-Family	828,744	900,523	940,549	973,978	1,031,239
Total Housing	1,479,490	1,535,871	1,592,928	1,649,518	1,713,651
Persons per Household	2.66	2.66	2.59	2.58	2.54
Employment					
Commercial	1,704,864	1,749,994	1,788,566	1,807,774	1,869,383
Industrial	136,023	135,594	134,061	131,686	131,285
Total Employment	1,840,887	1,885,588	1,922,628	1,939,460	2,000,667

Source: SCAG Regional Transportation Plan (2012), modified to represent LADWP's service area.

Exhibit ES-D
Average Climate Data for Los Angeles

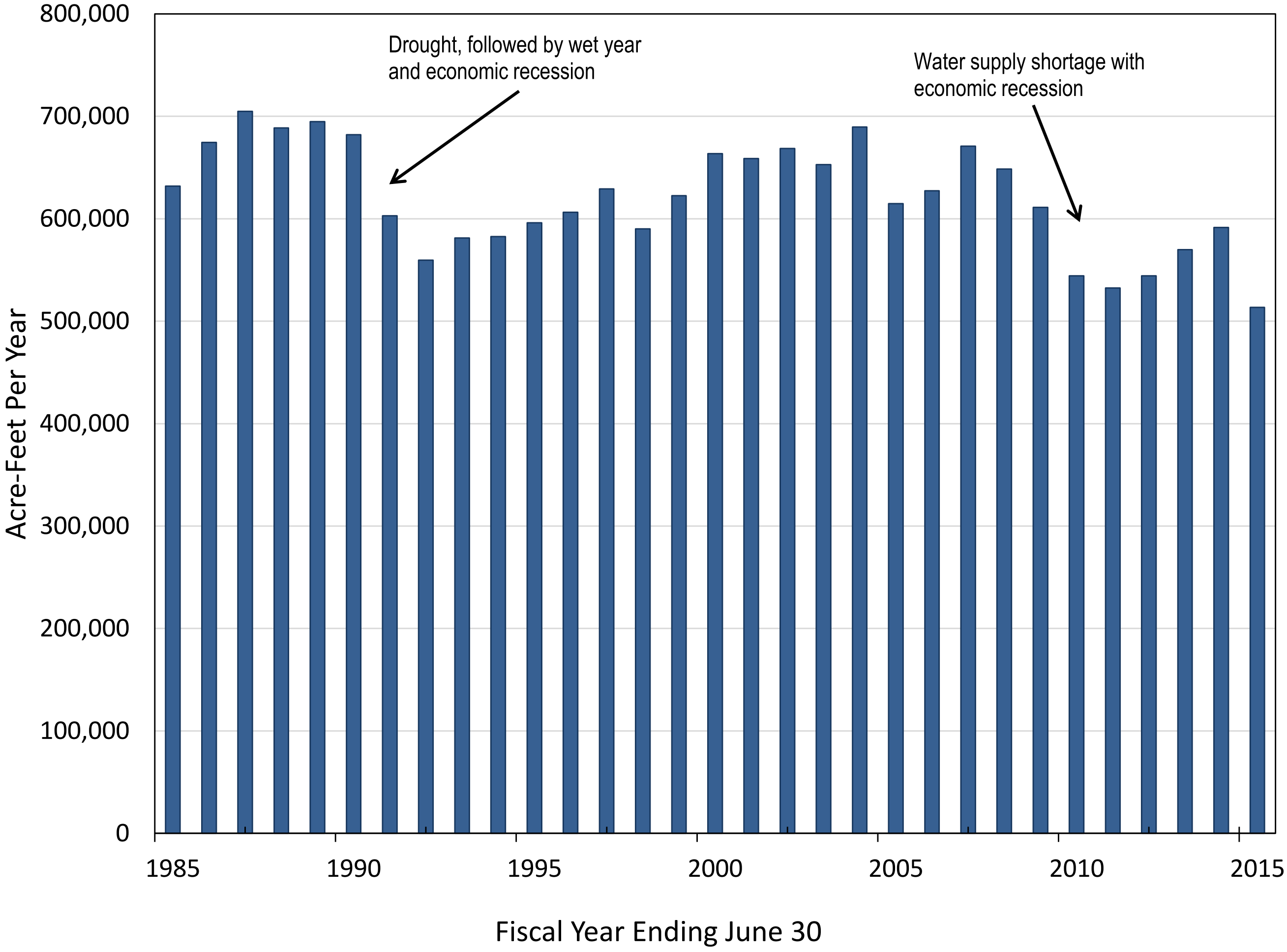
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temperature (ºF)[1]	69	68	70	73	75	78	83	84	84	79	73	68	75
Average Precipitation (inches)[1]	3.17	3.87	2.21	0.71	0.33	0.06	0.01	0.01	0.06	0.63	0.75	2.42	14.25
Average Eto (inches)[2,3]	2.03	2.26	3.53	4.27	4.96	5.24	5.89	5.60	4.53	3.25	2.17	1.74	45.47

1. 1990-2014, Los Angeles Downtown USC Weather Station, GHCND:USW00093134
2. Average of Glendale (Station Id. 133), Chatsworth (Station Id. 215), and Long Beach (Station Id. 174)
3. www.cimis.water.ca.gov

Historical Water Use

Exhibit ES-E presents the historical water demand for LADWP. Total water demand varies from year to year and is influenced by a number of factors including population growth, weather, water conservation, drought, and economic activity. In 2009, a 3-year water supply shortage coinciding with an economic recession required LADWP to impose mandatory conservation. Phase III water restrictions were put in place between June 2009 and August 2010. Following an ordinance amendment, Phase II implementation began on August 25, 2010 which allows outdoor watering three days per week. Starting in FY 2012/13 drought conditions returned, and the City experienced some of its driest weather on record. These conditions continued through FY 2014/15 and have triggered State and City mandatory conservation measures. As a result, FY 2014/15 water use decreased by 13 percent compared to FY 2013/14.

Exhibit ES-E
Historical Total Water Demand in LADWP's Service Area



Prior to 1990, population growth in Los Angeles was a good indicator of total water demand. From 1980 to 1990, population in the City grew at 1.7 percent annually. Water demand during this same period also grew at 1.7 percent annually. However, after 1991, LADWP began implementing water conservation measures. These conservation efforts over the last 25 years have been very successful, reducing overall demand to levels from the 1970's, despite the fact that over 1 million additional people now live in Los Angeles.

Analyzing Historical Water Use

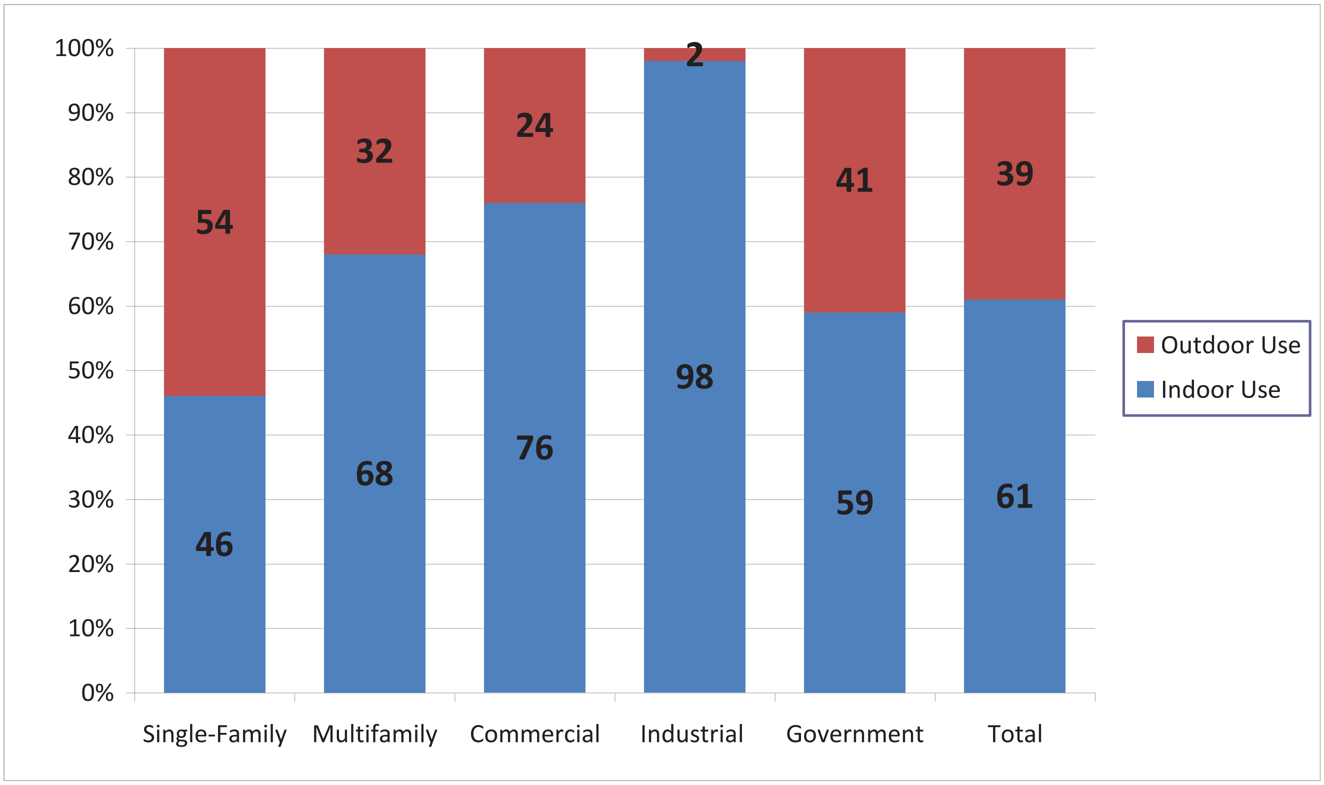
Exhibit ES-F shows the breakdown in average total water use by LADWP's major billing categories, including non-revenue water. Non-revenue water consists of unbilled but authorized consumption of water and water losses. Unbilled authorized consumption is water used for such things as firefighting and mainline flushing to improve water quality. Water losses are broken down into two categories: apparent losses and real losses. Apparent losses include meter inaccuracies and theft. Real losses come from system leakage. Historically, non-revenue water has averaged 5.9 percent of total water demand from FY 1990/91 through 2013/14. This consistently low percentage demonstrates that LADWP has an efficient, well-maintained water system. Although total water use has varied substantially from year to year, the breakdown in percentage of total demand among the major billing categories has been consistent.

Exhibit ES-F
Breakdown in Historical Water Demand for LADWP's Service Area

Fiscal Year Ending Average	Single-Family		Multi-Family		Commercial		Industrial		Government		Non-Revenue		Total
	AF	%	AF	%	AF	%	AF	%	AF	%	AF	%	AF
2011-2014	209,651	37%	165,364	29%	98,994	17%	17,663	3%	42,543	8%	32,774[1]	6%	566,990
2006-2010	236,154	38%	180,277	29%	106,964	17%	23,196	4%	42,956	7%	30,617	5%	620,165
2001-2005	239,754	37%	190,646	29%	109,685	17%	21,931	3%	41,888	6%	52,724	8%	656,628
1996-2000	222,748	36%	191,819	31%	111,051	18%	23,560	4%	39,421	6%	33,696	5%	622,295
1991-1995	197,322	34%	177,104	30%	110,724	19%	21,313	4%	38,426	7%	39,364	7%	584,253
24-Year Average	221,126	36%	181,042	30%	107,484	18%	21,533	4%	41,047	7%	39,100	6%	611,331

1. Calculated using AWWA Water Audit worksheet

Exhibit ES-G
Indoor and Outdoor Water Use in LADWP's Service Area



In order to assess the potential for water use efficiency and target conservation programs, it is important to characterize water use in terms of indoor and outdoor demands. As with most water utilities, LADWP does not have separate irrigation meters for most of its customers. LADWP conducted an analysis to determine indoor and outdoor water uses for its major billing categories. The analysis concluded that the City's total outdoor water use was approximately 39 percent of the total water use during the study period from 2004 to 2007 (see Exhibit ES-G).

Water Demand Forecast

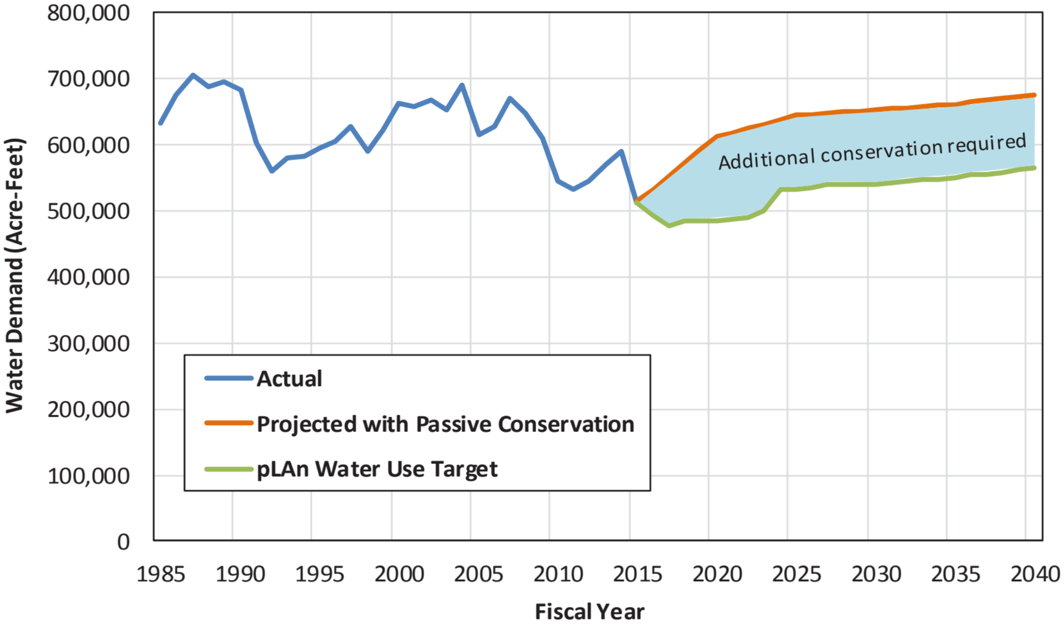
Based on historical demand and analyses, LADWP has developed a water demand forecast for each of its major categories of demand. This allows LADWP to better understand trends in water use, develop effective conservation programs, and invest appropriately in water supply development projects. The methodology used for the demand forecast is called a modified unit use approach. Exhibit ES-H presents the water demand forecast with passive water conservation savings incorporated from codes, ordinances, and conservation phases for each of the major categories of demand. The targeted water demands based on the water use reduction goals established in the Sustainable City pLAn are also listed for reference.

Exhibit ES-H
Water Demand Forecast with Passive Conservation Savings from Codes, Ordinances, and Conservation Phases for LADWP Service Area

Fiscal Year Ending	Water Demands by Sector (Acre-Feet)						
	Single-Family	Multi-Family	Commercial/ Government	Industrial	Non Revenue	Total	pLAn Target Use[1]
2020	222,958	184,679	148,600	18,869	36,709	611,815	485,600
2025	224,729	206,065	155,994	19,235	38,682	644,706	533,000
2030	226,770	211,454	156,788	18,701	39,173	652,886	540,100
2035	231,776	216,071	156,186	18,104	39,711	661,848	551,100
2040	231,767	225,994	159,554	17,829	40,541	675,685	565,600

[1] Targeted water demands set forth in the Mayor's Sustainable City pLAn

Exhibit ES-I
Comparing Water Demand Forecast with Passive Conservation to Water Use Targets in the pLAn



In the Sustainable City pLAn (pLAn), per capita water use targets refer to potable water demand. The pLAn Target Use shown in ES-H above reflects adding LADWP's planned recycled water supply to the pLAn's potable water demand target. This overall water demand target is compared to the water demand forecast with only code-base passive conservation to identify the additional conservation needed in the future (see Exhibit ES-I). Additional water conservation can come from increasing active conservation led by LADWP, as well as additional passive conservation. Passive conservation includes long-term behavioral changes in customer water use and compliance with codes and ordinances that mandate increased efficiency. LADWP is completing a comprehensive Water Conservation Potential Study that will identify remaining active and passive conservation opportunities. The results from this study will guide LADWP's future water conservation planning and program development.

Exhibit ES-J
Water Demand Variability from Historical Weather

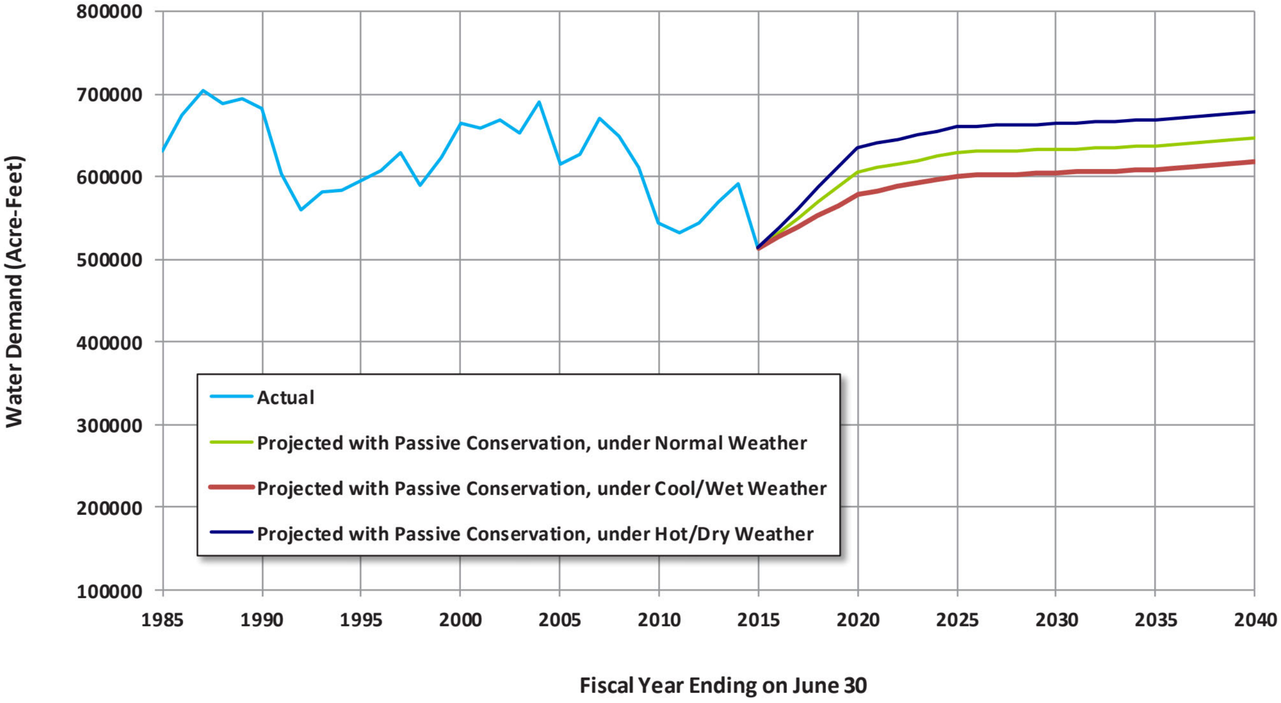


Exhibit ES-J shows that projected water demands can vary by approximately ± 5 percent in any given year due to weather variability. This means that water demands under cool/wet weather conditions could be as much as 5 percent lower than normal demands; while water demands under hot/dry conditions could be as much as 5 percent higher than normal demands.

ES-4 Water Conservation

Conservation has had a tremendous impact on Los Angeles' water use patterns and has become a permanent part of LADWP's water management philosophy. The City of Los Angeles has long recognized water conservation as the foundation for multiple strategies to improve water supply reliability. Through its investments in conservation, Los Angeles has become a national leader in water use efficiency. In the future, conservation will continue to be an important part of maintaining supply reliability and is a key component of ED5 and pLAn, which ultimately call for a 25 percent reduction in per capita water use by 2035 compared with 2013 levels.

Historical Conservation

The City's water usage is about the same as it was in the 1970s despite an increase in population of more than 1.1 million people. Exhibit ES-K shows both hardware and non-hardware conservation savings from FY 1990/91 through FY 2014/15, Hardware savings are achieved mainly through installation of conservation devices subsidized by rebates and incentives. Cumulative annual water savings since the inception of LADWP's subsidized hardware programs totals 118,034 AFY. Additional non-hardware water savings have been achieved through changes in customer behaviors and lifestyle.

Exhibit ES-K
Historical City of Los Angeles Conservation

Fiscal Year	Additional Annual Hardware Installed Savings (AF)	Cumulative Annual Hardware Savings (AF)	Annual Non-Hardware Savings (AF)	Annual Total Savings (AF)
Prior to 1990/1991	31,825	31,825		
1990/1991	4,091	35,916	76,350	112,266
1991/1992	8,670	44,586	105,593	150,179
1992/1993	3,286	47,872	58,546	106,418
1993/1994	4,961	52,832	60,928	113,760
1994/1995	4,041	56,873	62,084	118,957
1995/1996	4,642	61,516	52,648	114,164
1996/1997	2,376	63,892	33,720	97,612
1997/1998	2,637	66,529	30,434	96,963
1998/1999	2,781	69,310	38,305	107,615
1999/2000	3,532	72,842	80,909	153,751
2000/2001	3,078	75,920	79,527	155,447
2001/2002	2,452	78,371	95,428	173,799
2002/2003	2,630	81,002	94,463	175,465
2003/2004	3,257	84,259	84,023	168,282
2004/2005	3,299	87,558	114,428	201,986
2005/2006	2,404	89,963	118,574	208,537
2006/2007	2,095	92,058	116,922	208,980
2007/2008	782	92,840	110,628	203,468
2008/2009	3,127	95,967	149,567	245,534
2009/2010	4,269	100,236	183,080	283,316
2010/2011	2,495	102,731	185,640	288,371
2011/2012	1,993	104,724	183,852	288,576
2012/2013	2,122	106,846	187,444	294,290
2013/2014	3,977	110,823	189,689	300,512
2014/2015	7,211	118,034	272,721	390,755

Driven mainly by the drought beginning in 2008, residential customers have attained conservation levels exceeding 30 percent, measured during the period between FY 2006/07 and FY 2014/15. Furthermore, the City has updated its Emergency Water Conservation Plan Ordinance's enforceable water waste provisions and mandatory outdoor watering restrictions. The City has also implemented a restructured Water Rate Ordinance that promotes conservation through an expanded 4-tiers rate structure. As a direct result of conservation, imported water purchases from MWD are well below baseline allocations for FY 2014/15.

Water Conservation Goals

Conservation is the foundation for LADWP's water resource planning, and will continue to be over the long term. Water conservation reduces demand that typically rises over time with growth in population and commerce. Preventing these increases in demand improves water supply reliability, reduces costs, and for Los Angeles decreases reliance on purchased imported water from MWD. LADWP must meet multiple water conservation goals established in ED5, pLAn, and the Water Conservation Act of 2009.

ED5 and pLAn Goals

ED5 and pLAn stipulate water savings goals as follows:

- By 2017, reduce per capita potable water use by 20 percent;
- By 2025, reduce per capita potable water use by 22.5 percent; and
- By 2035, reduce per capita potable water use by 25 percent.

Achieving these goals will require an aggressive approach by LADWP, employing the following strategies:

- Investments in state-of-the-art technology
- Rebates and incentives promoting water-efficient appliances such as weather-based irrigation controllers (WBICs), efficient clothes washers, and waterless urinals
- Expansion and enforcement of prohibited water uses, including reductions in outdoor water use
- Extension of education and outreach efforts that encourage regional conservation.
- Tiered water pricing
- Technical Assistance Program (TAP) for business and industry
- Large landscape irrigation and efficiency programs

Water Conservation Act of 2009

The Water Conservation Act of 2009, Senate Bill x7-7, requires water agencies to reduce per capita water use by 20 percent by 2020 (20x2020). This includes potable water use reductions due to expanded use of recycled water. Water suppliers are required to set a water use target for 2020 and an interim target for 2015 using one of four methods. Requirements for each method are stipulated by the Department of Water Resources (DWR). The 2020 urban water use target may be updated in a supplier's 2015 UWMP. Failure to meet adopted targets puts a water supplier at risk of being ineligible for water grants or loans administered by the State. In 2015, urban retail water suppliers are required to report interim compliance followed by actual compliance in 2020. Exhibit ES-L provides LADWP's 20x2020 base and target data using DWR's Method 3. These targets are less stringent than those established in ED5 and pLAn.

Exhibit ES-L
20x2020 Base and Target Data Based on Method 3

20x2020 Required Data	Gallons Per Capita Per Day (GPCD)
Base Per Capita Daily Water Use	
10-Year Average[1]	154
5-Year Average[2]	152
2020 Target Using Method 3[3]	
95% of Hydrologic Region Target (149 gpcd)	142
95% Of Base Daily Capita Water Use 5-Year Average (152 gpcd)	144
2020 Target	142
2015 Interim Target	**148**
2015 Actual Use	**114**

1. Ten-year average based on fiscal year 1995/96 to 2004/05
2. Five-year average based on fiscal year 2003/04 to 2007/08
3. Methodology requires smaller of two results to be actual water use target to satisfy minimum water use target.

Existing Conservation Programs and Practices

LADWP is currently involved in many programs and employs multiple technologies to achieve its water conservation goals. These efforts are implemented in conjunction with State and local ordinances and plumbing code modifications. Specifically, these include:

- **State Laws and City Ordinances** - such as the Model Water Efficient Landscape Ordinance, installation of efficient fixtures, Plumbing Retrofit on Resale Ordinance, and Emergency Water Conservation Plan Ordinance;

- **Conservation Pricing** – use of four tier water rates for single-dwelling-unit residential customers, which promotes conservation while recovering higher cost of providing water to high users;

- **California Urban Water Conservation Council (CUWCC) Best Management Practices BMPs** – As a signatory to the CUWCC's Memorandum of Understanding (MOU), LADWP must complete a biennial report detailing progress in implementing the BMPs specified in the MOU;

- **Public Outreach** – including education in schools, public service announcements, and training seminars;

- **Rebate Programs** – participation in MWD's SoCal Water$mart Program for single-family and multi-family residences, and CII customers ; and implementation of LADWP in-house and partnership programs.

Water Conservation Potential Study

LADWP's Water Conservation Potential Study (WCPS) will help prioritize future water conservation investments. The WCPS has identified initial conservation potential for the LADWP service area, that includes a cost-effective strategy to maximize water savings. Final results of the WCPS will play an important role in LADWP's plans to meet both the State 20x2020 requirements and the City's more aggressive conservation targets in ED5 and pLAn.

ES-5 Future Water Supplies

LADWP's commitment is to provide a highly reliable water supply by implementing cost-effective conservation, recycled water, and stormwater capture programs, ultimately meeting the targets established in ED5 and pLAn. In addition, LADWP is also pursuing water to replace a portion of the LAA water used for environmental mitigation in the Eastern Sierra Nevada.

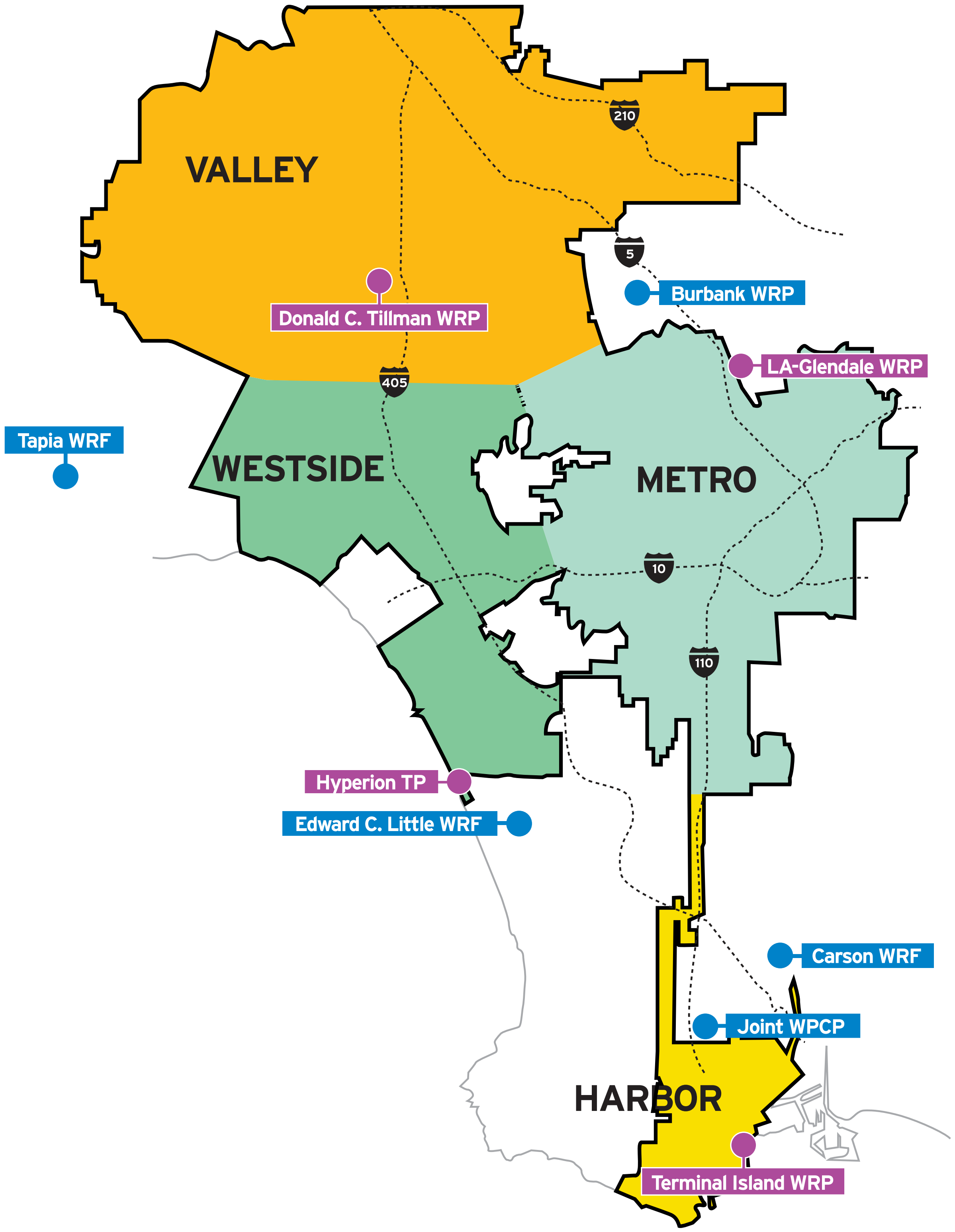
Water Recycling

LADWP is committed to significantly expanding the use of recycled water. Future recycled water projects will build on the success of prior projects. Expanding recycled water use to offset potable demands will help LADWP achieve goals set down in ED5 and pLAn, including reducing imported water purchases from MWD. The pLAn also establishes specific goals for recycled water use. In order to meet these goals, LADWP is working with the Los Angeles Department of Public Works Bureau of Sanitation (LASAN) and Bureau of Engineering (BOE), to develop new recycled water projects for irrigation and industrial uses. In addition, the City is pursuing a Groundwater Replenishment Project to replenish the SFB with purified recycled water. LADWP is also studying additional opportunities to expand the use of recycled water over the long-term.

Wastewater Treatment Infrastructure

LADWP's water recycling program depends on the City's wastewater treatment infrastructure and facilities located within and outside of the City's boundaries. LASAN is responsible for the planning and operation of the City's wastewater treatment infrastructure. This wastewater system serves 573 square miles, 456 square miles of which are within the City. Wastewater service is also provided by the City to 29 non-City agencies through contract services. The treated water from the City's four wastewater plants is utilized by LADWP to meet its recycled water demands. Upon completion of currently planned recycled water projects, LADWP will then enter into agreements with neighboring agencies to obtain additional recycled water. Exhibit ES-M shows the City's four recycled water service areas in relation to the City's four wastewater treatment plants (purple) and sources of recycled water located outside of the LADWP service area (blue).

Exhibit ES-M
Wastewater Treatment Plants and Existing and Future Sources of Recycled Water for LADWP Service Area



Recycled Water Planning Efforts

Given current drought and City initiatives, LADWP is rapidly accelerating the development of recycled water. LADWP, in partnership with LASAN and BOE, completed a Recycled Water Master Planning documents (RWMP) in 2012 to identify future recycled water opportunities and programs. The primary objective of the RWMP was to develop plans for achieving and exceeding a recycled water target of 59,000 AFY by 2035, which was established in the 2010 UWMP. Two major strategies from the RWMP are:

- Development of a groundwater basin replenishment program using highly purified recycled water, often referred to as indirect potable reuse; and
- Expansion of the existing non-potable recycled water systems.

Since completion of the RWMP, recycled water targets have been increased by the initiatives in ED5 and pLAn. The pLAn established the following recycled water goals:

- By 2017, expand production of recycled water by 6 million gallons per day (mgd) at the Terminal Island Water Reclamation Plant;
- Convert 85% of public golf courses to recycled water;
- Develop a strategy to convert the City's lakes to recycled water and implement a pilot project; and
- Expand recycled water production, treatment, and distribution to incorporate indirect and direct potable reuse.

Groundwater Replenishment

As part of the RWMP, the City proposed a Groundwater Replenishment Project using highly purified recycled water from the Donald C. Tillman Water Reclamation Plant (DCTWRP). This water will be delivered to the existing Hansen Spreading Grounds and Pacoima Spreading Grounds in the San Fernando Valley area. The project will require construction of an Advanced Water Purification Facility (AWPF) which will further treat tertiary effluent from DCTWRP. The new AWPF is expected to include microfiltration, reverse osmosis, and advanced oxidation. Goals for AWPF include:

- Recharge up to 30,000 AFY by 2024 in the SFB, a major potable water supply for LADWP
- A plant capacity of 35 mgd
- Establish no regulatory limitations on spreading amounts; and,
- Produce water that complies with Regional Water Quality Control Board and SWRCB requirements, suitable for indirect potable reuse.

Recycled Water Use Projection

Recycled water use projections in five year increments beginning in FY 2019/20 through 2039/40 are presented in Exhibit 4ES-N. These projections outline, by recycled water category, LADWP's plans to increase recycled water use and meet ED5 and pLAn goals. Recycled water use is projected to reach 59,000 AFY in FY 2024/25 and further increase to 75,400 AFY by FY 2039/40. The goal of 75,400 will be achieved by adding the following amounts to the existing supply of 10,400 AFY: 19,000 AFY of planned municipal and industrial use, 16,000 AFY of customer growth, and 30,000 AFY from groundwater replenishment. Environmental reuse is expected to remain constant at 26,740 AFY.

Exhibit ES-N
Recycled Water Use Projections

Category	Project Use (AFY)				
	FY 19/20	FY 24/25	FY 29/30	FY 34/35	FY 39/40
Municipal and Industrial Uses[1]	19,800	29,000	39,000	42,200	45,400
Indirect Potable Reuse (Groundwater Replenishment)	0	30,000	30,000	30,000	30,000
Subtotal	19,800	59,000	69,000	72,200	75,400
Environmental Use[2]	26,740	26,740	26,740	26,740	26,740
Total	46,540	85,740	95,740	98,940	102,140

1. LADWP Recycled Water Group, UWMP 2015 Recycled Water Projections 2015.08.29.xlsx. Does not include deliveries of 58,247 AFY to Edward C. Little Water Recycling Facility.
2. Historical water use has been 26,600 for environmental uses associated with DCTWRP. Actual yearly use will fluctuate based on conditions. 26,600 AFY is used for future planning purposes for environmental uses associated with DCTWRP plus 140 AFY for Machado Lake. Water associated with DCTWRP environmental uses is ultimately discharged to the Los Angeles River, providing additional environmental benefits.

Stormwater Capture

Stormwater runoff from urban areas is an underutilized local water resource. Within the City of Los Angeles, the majority of stormwater runoff is directed to storm drains and is ultimately channeled into the ocean. Unused stormwater reaching the ocean carries with it many pollutants that are harmful to marine life and public health. In addition, local groundwater aquifers that should be replenished by stormwater are receiving less recharge than in the past due to increased urbanization. Urbanization increases the City's hardscape, which results in less infiltration of stormwater and a decline in groundwater levels. In response, LADWP completed a Stormwater Capture Master Plan (SCMP) in 2015 to comprehensively evaluate stormwater capture potential within the City.

Stormwater capture can be achieved by increasing infiltration into groundwater basins (i.e., groundwater recharge) and by onsite capture and reuse of stormwater for landscape irrigation (i.e., direct use). Conservatively, additional stormwater capture projects will increase groundwater recharge by 66,000 AFY and increase direct use by 2,000 AFY, using both centralized and distributed approaches. This leads to a conservative scenario estimate of total stormwater capture potential of 132,000 AFY by 2035, which includes both existing and new stormwater capture volumes. Under a more aggressive scenario approach, total stormwater capture potential in 2035 could be as high as 178,000 AFY.

Groundwater recharge using stormwater is essential for halting the long-term decrease in stored groundwater, protecting the safe yield of the groundwater basin, and maintaining the SFB as a reliable water resource. Centralized projects will allow the City to sustainably utilize its stored water credits while preventing basin overdraft. By 2040, this UWMP projects that LADWP will be able to pump a minimum of 15,000 AFY additional from the SFB due to stormwater projects that increase infiltration. Anticipating that stored groundwater will rebound in response to enhanced groundwater replenishment, LADWP will work with the Upper Los Angeles River Area Watermaster to continue monitoring water levels and to re-evaluate basin safe yield. Over time, this may allow for additional increases in groundwater production as SFB elevations rebound.

By 2040, the UWMP projects 2,000 AFY of additional water conservation through direct-use stormwater projects that offset potable water use. These water savings contribute to meeting the Mayor's overall water conservation goals.

Water Transfers

LADWP plans to replace a portion of the Los Angeles Aqueduct water currently being reallocated for environmental enhancements with water transfers of up to 40,000 AFY. The plan would authorize purchases of water when water is available and economically beneficial to LADWP. Transferred water could be stored, or delivered directly to LADWP's transmission and distribution system. Most of the of transferred water will come from the State Water Project (SWP), but LADWP is also seeking opportunities to transfer water from other sources. Having water transfer agreements in place increases operational flexibility and provides cost savings for LADWP customers.

To enable water transfers from the SWP, LADWP has constructed the Neenach Pumping Station which provides an interconnection between the LAA and the East Branch of SWP's California Aqueduct. The pumping station is located where the two aqueducts intersect in the Antelope Valley, and is estimated to be operational in 2017/18.

ES-6 Water Supply Reliability

With its current water supplies, planned future water conservation, and planned future water supplies, LADWP will be able to reliably provide water to its customers through the 25-year period covered by this UWMP. LADWP's reliability projections account for water quality issues with source waters and the impacts of climate change on both supplies and demands. To meet targets established in ED5 and pLAn, LADWP will reduce water consumption through conservation, increase recycled water use (including both non-potable and indirect potable reuse), and reduce reliance on imported water from MWD.

Exhibit ES-O shows the current supply mix for the five-year average from FY 2010/11 to FY 2014/15. Exhibits ES-P and ES-Q show the future supply mix for FY 2039/40 under single/multiple dry years and average weather conditions respectively. Direct stormwater reuse projections are combined with new water conservation. The groundwater portion of the portfolio reflects the impacts of groundwater replenishment using recycled water, and increases in captured stormwater. The exhibits show that the City's locally-developed supplies will increase from 14 percent to 49 percent in dry years, or to 47 percent in average years. These local supplies are not influenced by variability in hydrology, and will become the cornerstone of LA's future water supplies. As a result, the City's combined imported supplies will decrease significantly from 86 percent to 51 percent in dry years, or to 53 percent in average years. As for the City's imported supplies, they are still impacted by hydrology. The LAA has limited storage capacity, which means it is very susceptible to variations in hydrology, while MWD (with much greater storage capacity) can provide a water supply to the City that is less susceptible to hydrologic conditions. By FY 2039/40 LAA deliveries are projected to be 7 percent in dry years, or 42 percent in average years. MWD will make up the remaining 44 percent in dry years, or provide 11 percent of the City's needs in average years.

Exhibit ES-O
LADWP Supply Reliability FYE 2011-2015 Average

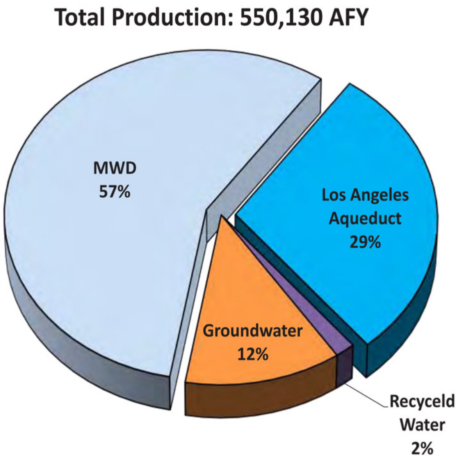


Exhibit ES-P
LADWP Supply Reliability Under Single/Multiple Dry Year Conditions in Fiscal Year 2039-40

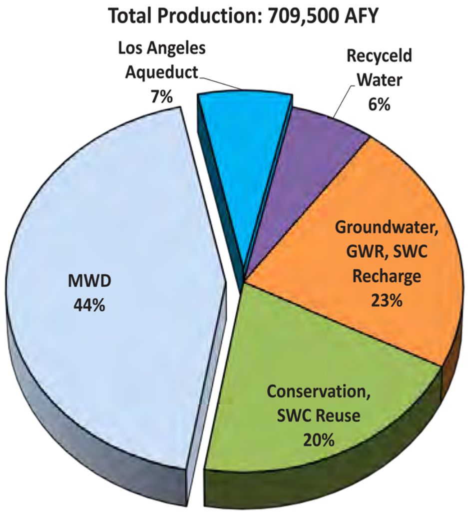
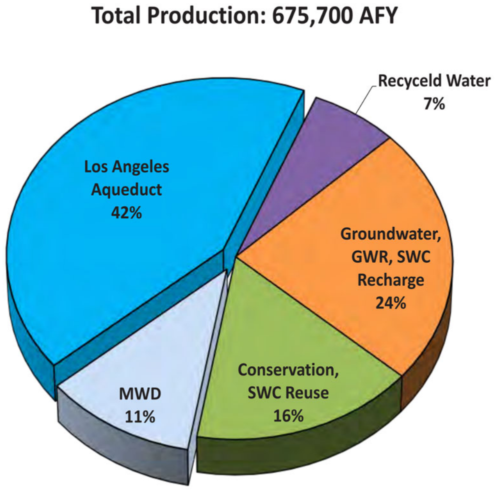


Exhibit ES-Q
LADWP Supply Reliability Under Average Year Conditions in Fiscal Year 2039-40



Note: Charts do not reflect 118,034 AF of existing conservation

Supply Reliability Assessment

To demonstrate LADWP's water supply reliability, Exhibit ES-R summarizes the water demands and supplies for single dry year conditions through FY 2039/40. This represents the City's planned supply portfolio under the most critical hydrologic conditions. Exhibit ES-S summarizes the water demands and supplies for average year conditions, which has the highest probability of occurring.

Exhibit ES-R
Service Area Reliability Assessment for Single Dry Year

Demand and Supply Projections (in acre-feet)	Single Dry Year (FY2014-15) Fiscal Year Ending on June 30				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	156,700	143,700	145,100	143,500	143,500
Los Angeles Aqueduct[4]	32,200	51,900	51,400	51,000	50,600
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	100	200	300	300	400
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	323,470	369,470	380,470	396,670	398,970
MWD Water Purchases					
With Existing/Planned Supplies	318,930	307,430	305,030	298,230	310,530
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	278,930	267,430	265,030	258,230	270,530
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
5. Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.
6. Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Exhibit ES-S
Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	**Average Weather Conditions (FY 1961/62 to 2010/11) Fiscal Year Ending on June 30**				
	2020	**2025**	**2030**	**2035**	**2040**
Total Water Demand[1]	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	125,800	110,900	111,600	109,100	108,100
Los Angeles Aqueduct[4]	275,700	293,400	291,000	288,600	286,200
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	400	800	1,200	1,600	2,000
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	536,370	578,770	587,470	601,170	600,770
MWD Water Purchases					
With Existing/Planned Supplies	75,430	65,930	65,430	60,630	74,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	35,430	25,930	25,430	20,630	34,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
5. Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.
6. Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Exhibit ES-T presents the supply reliability for the driest three-year sequence from Fiscal Year Ending (FYE) 2016 to 2018, as required by the UWMP Act, indicating LADWP will be able to maintain reliability under this sequence.

Exhibit ES-T
Driest Three-Year Water Supply Sequence

Demand and Supply Projections (in acre-feet)	Actual FY	Driest Three Consecutive Years (FY2012-13 to FY2014-15) Fiscal Year Ending on June 30		
	2015	2016	2017	2018
Total Water Demand[1]	**513,540**	**538,900**	**580,700**	**601,300**
pLAn Water Demand Target		**492,300**	**478,700**	**484,300**
Existing / Planned Supplies				
Conservation (Additional Active[2] and Passive[3] after FY14/15)	0	46,600	102,000	116,900
Los Angeles Aqueduct[4]	53,546	77,800	111,400	33,700
Groundwater[5] (Net)	87,046	72,803	73,641	90,748
Recycled Water				
- Irrigation and Industrial Use	10,437	11,000	13,000	19,000
- Groundwater Replenishment	0	0	0	0
Stormwater Capture				
- Stormwater Reuse (Harvesting)	0	0	0	100
- Stormwater Recharge (Increased Pumping)	0	0	0	0
Storage Change	96	0	0	0
Subtotal	150,933	208,203	300,041	260,448
MWD Water Purchases				
With Existing/Planned Supplies	362,607	330,697	280,659	340,852
Total Supplies	**513,540**	**538,900**	**580,700**	**601,300**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
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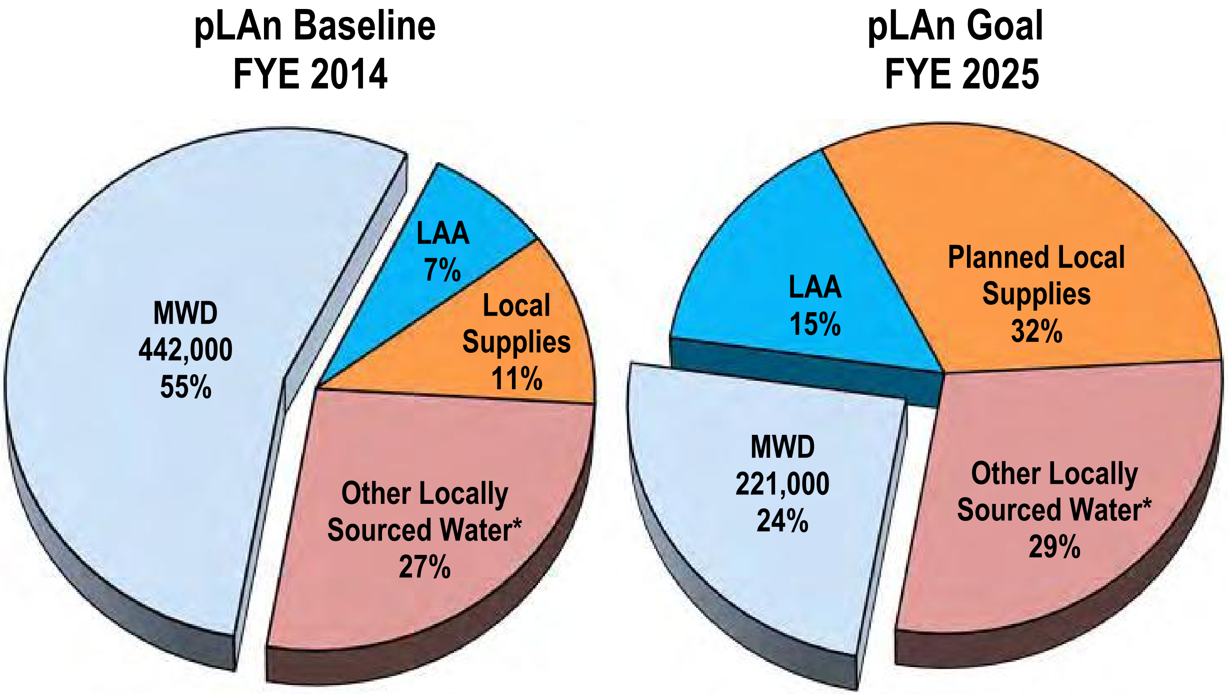
City pLAn Targets

In April 2015 the Mayor released the City's first ever Sustainable City pLAn, with a focus of improving the environment, economy, and equity in Los Angeles. The pLAn contains a number of water resources goals, including:

- Reduce average per capita potable water use by 20 percent from FY 2013/14 by 2017
- Reduce average per capita potable water use by 22.5 percent from FY 2013/14 by 2025
- Reduce imported water purchases from MWD by 50 percent from 2013/14 by 2025
- Reduce per capita potable water use by 25 percent from 2013/14 by 2035; and,
- Expand all local sources of water so that they account for at least 50 percent of the total supply by 2035

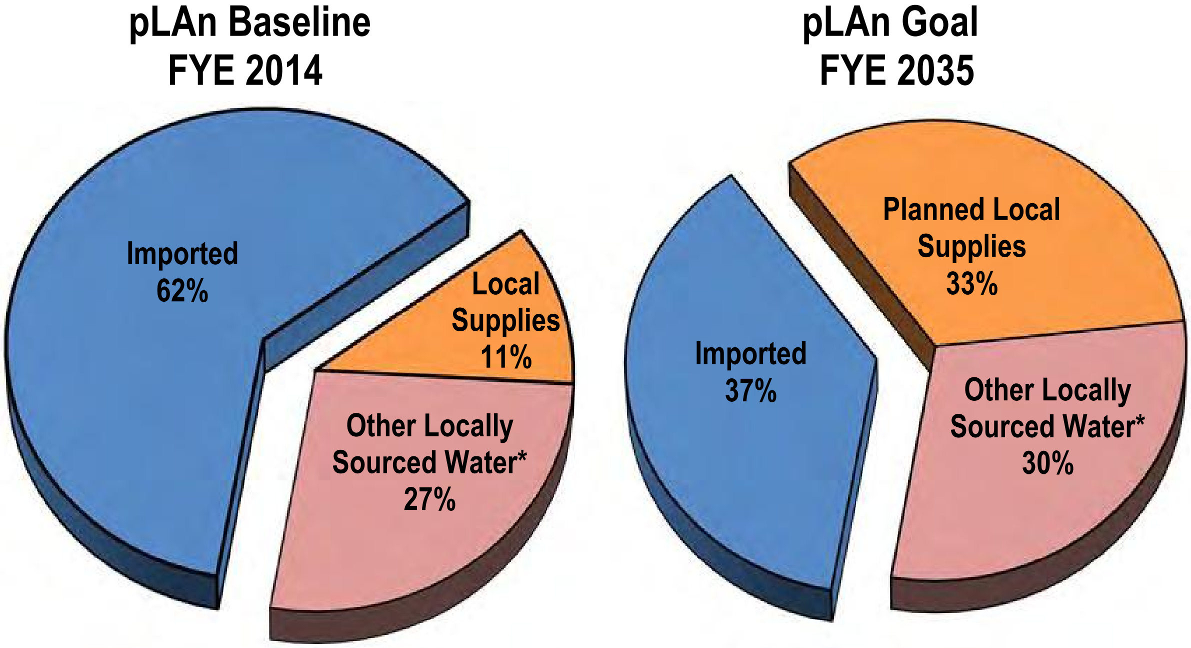
Using the targets for LAA, recycled water, groundwater, conservation, and stormwater captured presented in Exhibit ES-S, plus accounting for past conservation, beneficial reuse of treated wastewater and stormwater capture, LADWP demonstrates its commitment to meeting the water resources goals established in the City's pLAn. Exhibit ES-U presents the strategy towards reducing imported water purchases from MWD by 50 percent in 2025. In FY 2013/14, MWD purchases were 442,000 AFY. In FY 2025, accounting for the planned local supplies summarized in Exhibit ES-S, MWD purchases will achieve 50 percent reduction under most hydrologic conditions and total 221,000 AFY or less. Only during extremely dry hydrologic conditions for the LAA (approximately 11 percent of the time) will MWD purchases be greater than the target established by the City's pLAn.

Exhibit ES-U
Achieving 50 Percent Reduction in MWD Water Purchases by 2025



*Other Locally Sourced Water consists of: Historical Conservation, Stormwater Capture, Beneficial Reuse/Other

Exhibit ES-V
Expanding Local Sources of Water to Account for 50 Percent of Total Supply by 2035



*Other Locally Sourced Water consists of: Historical Conservation, Stormwater Capture, Beneficial Reuse/Other

Exhibit ES-V presents the strategy towards expanding local supplies to account for 50 percent of the total water supply by 2035 will be achieved. In FY 2013/14 all local sources of water (inclusive of past conservation, stormwater capture and beneficial reuse of treated wastewater) accounted for 38 percent of the total water supply. In FY 2035, accounting for the planned local supplies summarized in Exhibit ES-S, local sources of water are projected to account for 63 percent of the total water supply.

Water Quality Issues

Water quality is an important consideration when managing water resources and ensuring future water reliability. LADWP closely monitors water quality issues and their effect on source water reliability, and tracks proposed regulations at the local, state and federal levels. LADWP proactively researches and invests in advanced technologies to ensure continued safety and reliability of the City's water supplies.

LADWP is committed to cost effectively meeting or exceeding water quality regulations and the water quality needs of its customers. LADWP meets this commitment by employing state-of-the-art water treatment processes, maintaining and operating treatment facilities, and diligently monitoring water quality. Drinking water standards are set by the U.S. Environmental Protection Agency and the SWRCB Division of Drinking Water.

Global Climate Change

LADWP has integrated the potential impacts of climate change into its long-term water supply planning. Climate change is a global concern, but is particularly important in the Southwest

United States where water tends to be less abundant. This means that climate change can have significant impacts on water resources, and the level of planning necessary to ensure future water reliability. With respect to Los Angeles, climate change can impact surface supplies from the LAA, imported supplies from Metropolitan Water District (MWD) that originate from the Western Sierra watershed and Colorado River basin, and local supplies.

Scientists use complex computer generated global climate models (GCMs) to simulate climate systems and predict future climate change scenarios. Although most of the scientific community agrees that climate change is occurring and will cause an increase in mean global temperatures, the specific degree of this increase cannot be accurately predicted. Predictions of changes in precipitation are even more speculative, with some showing precipitation increasing in the future and others showing the opposite. But climate change clearly increases uncertainty about the future availability and consistency of traditional water sources. Water supply planning must consider this increased uncertainty and mitigate the risks.

A widely held belief in the scientific community is that increases in concentrations of greenhouse gas emissions (GHGs) in the atmosphere are a contributing factor to climate change. As such, California is leading the way with laws that require reductions in GHG emissions, and require that climate change impacts be integrated into long range water resource planning. A substantial amount of energy use, and therefore GHG emissions, occur as a result of moving, treating, and distributing water to customers with adequate water pressure. LADWP has taken the initiative to study the nexus between water and energy consumption, and to evaluate the associated carbon footprint of its water system.

Water Demand and Local Impacts

Climate change can impact the local climate and in turn alter projected water demands. A range of GCMs were analyzed to establish three models representative of potential climate change for the Los Angeles area:

- **Hot & Dry** – Micro-ESM-Chem.1 for an RCP of 8.5 – This model was developed by the Japan Agency for Marine Earth Science and Technology, Atmosphere and Ocean Research at the University of Tokyo, and the National Institute for Environmental Studies.

- **Warm & Wet** – GISS-E2.R.1 for an RCP of 4.5 – This model was developed by the NASA Goddard Institute for Space Studies.

- **Average** (or central tendency of all 34 models and RCP variations) – IPSL-CM5B-LR.1 for an RCP of 4.5 – This model was developed by the Institut Pierre Simon Laplace.

The hot & dry and warm & wet models represent a high and low forecast under climatic change conditions and are used to determine impacts on Los Angeles' demands. Projected average annual precipitation and average daily maximum temperatures for the period 2030 to 2050 were developed. Overall, there is a 9-inch range between the hot & dry and warm & wet models. Even the average model shows an increase in the average daily maximum temperature ranging between 2.01 and 4.54°F.

The impacts of these climate effects will likely influence projected water demands. The greatest increase in demands over the baseline in 2040 with passive conservation is associated with the hot & dry scenario resulting in an increase in demands of 42,900 AF (7% increase). This is followed by the central tendency scenario at 23,400 AF (4% increase), and the warm & wet scenario at 2,200 AF (less than one percent increase).

Los Angeles Aqueduct Impacts

To address the challenges posed by climate change on the LAA, LADWP completed a climate change study in 2011. The study evaluated the potential impacts of climate change on the Eastern Sierra Nevada watershed and therefore LAA water supply and deliveries. It also investigated opportunities to improve the LAA system in order to mitigate against potential impacts. Projected changes in temperature (warmer winters) will change precipitation patterns. Rain will occur more frequently than in the past, and peak Snow Water Equivalent (SWE) and runoff are projected to occur earlier in the spring.. This study is helping water managers plan and develop measures to enhance the performance of the LAA and ensure future reliability.

State Water Project Impacts

More recent information about the nature of expected climate change in California is provided in the California Water Plan Update 2013 (Update 2013). Released by DWR on October 30, 2014, Update 2013 is the State government's strategic plan for understanding, managing and developing water resources statewide. According to the report, higher temperatures are melting the Sierra Nevada snowpack earlier in the year and driving the snowline higher. This reduces the snowpack, and snowpack amounts to stored water for Californians and the environment. The Update 2013 also predicts that droughts are likely to become more frequent and persistent. Intense rainfall events are expected to continue, possibly leading to more frequent and/or more extensive flooding. Storms and snowmelt may coincide and produce higher winter runoff. Sea level rise could cause higher surges during coastal storm events. Rising sea levels also increase susceptibility to coastal flooding and increase salt water intrusion into coastal groundwater basins. Sea level rise will also place additional constraints on water exports from the Sacramento-San Joaquin Delta. Findings from these reports further illustrate the climate change challenges facing water purveyors and utilities.

Colorado River Aqueduct Impacts

Climate change impacts on the Colorado River Basin (Basin) are comprehensively addressed by the US Bureau of Reclamation in the Colorado River Basin Water Supply and Demand Study, completed in 2012. This is one of four hydrologic supply projections incorporated into a scenario planning process. The climate change hydrology analysis from the study predicts lower average river flows throughout the Basin, and predicts compromised Basin reliability over a wide range of demand and operational scenarios. Climate change projections from 2011 to 2060 predict continued warming throughout the basin, causing earlier snowmelt and shifting peak streamflow from June to May at many locations. This warming also causes more precipitation to fall as rain instead of snow.

Water and Energy Nexus

Much of the carbon dioxide released into the atmosphere, and the emission of other GHGs, result from the burning of fossil fuels, for example crude oil and coal in the generation of energy. Since significant energy is required to move water over long distances and elevations, there is a link between managing the water supply and GHG emissions. Source water extraction, treatment, and local distribution also use significant amounts of energy. The measure of GHG emissions, sometimes referred to as "carbon footprint," is expressed in tons (T) of carbon dioxide (CO2). This carbon footprint can be estimated for specific water resources and water utility activities. Once the magnitude of the carbon footprint is known, strategies can be developed to better manage and reduce impacts on the atmosphere and therefore climate change.

LADWP has taken the initiative to study the nexus between water and energy consumption, and to evaluate the associated carbon footprint of its water supply sources. The most energy intensive source of water for LADWP is water purchased from MWD, which imports SWP supplies via the California Aqueduct and Colorado River supplies via the Colorado River Aqueduct. LADWP also imports water via the LAA, which is a net producer of energy because the water is used to generate electricity that is used by Angelinos. Local sources of water for LADWP include groundwater and recycled water. The energy to produce groundwater may increase because of the need for more intensive treatment. However, groundwater is expected to remain a relatively low energy water source compared to imported water from MWD. Producing recycled water is more energy intensive than groundwater, but still uses less energy per unit volume than imported MWD water.

Climate Change Adaption and Mitigation

Climate change strategies fall under two main categories: adaptation and mitigation. For water resources, a climate change adaptation strategy involves counteracting the impacts of climate change through conservation and increasing efficiency, and relying on water resources that are less vulnerable to climate change. A mitigation strategy involves proactive measures that reduce GHG emissions. LADWP's plans to dramatically increase conservation, water recycling, and stormwater capture all represent both adaptation and mitigation strategies. LADWP Power System resource planning efforts have also complemented Water System strategies to address climate change.

ES-7 Financing

Funding for water resource programs and projects are primarily provided through LADWP water rates, with supplemental funding provided by MWD and state and federal grants. LADWP is also seeking reimbursement from responsible parties to assist with groundwater treatment costs. To fund future programs, LADWP will utilize the following funding sources:

- **Water Rates** – The revenue collected through LADWP's current water rates is the primary funding source for resource programs designed to achieve the City's goals. This includes conservation, water recycling, stormwater capture, and remediating the contamination in the San Fernando Basin.

- **Funding Support from MWD** – MWD provides funding through their Local Resources Program (LRP) for the development of water recycling, groundwater recovery, and seawater desalination. The LRP incentive structure offers three options: sliding scale incentives up to $340/AF over 25 years, sliding scale incentives up to $475/AF over 15 years, or fixed incentives up to $305/AF over 25 years. MWD also promotes conservation through its Conservation Credits Program, providing up to $195/AF. Since its inception in 1990, the Conservation Credits Program has provided $487 million in rebates and incentives, producing cumulative water savings of 2.2 million AF through 2015.

- **State Funds** – Funds for recycling, groundwater, conservation, and stormwater capture have been available on a competitive basis though voter approved initiatives, such as Propositions 50, 84 and 1. Proposition 1 allocates $900 million to prevent or clean up contaminated groundwater. Occasionally, low or zero-interest loans are also available through State Revolving Fund programs.

- **Federal Funds** – Federal funding for recycling is available through the U.S. Army Corps of Engineers, via periodic Water Resource Development Act legislation, and the U.S. Bureau of Reclamation's Title XVI program.

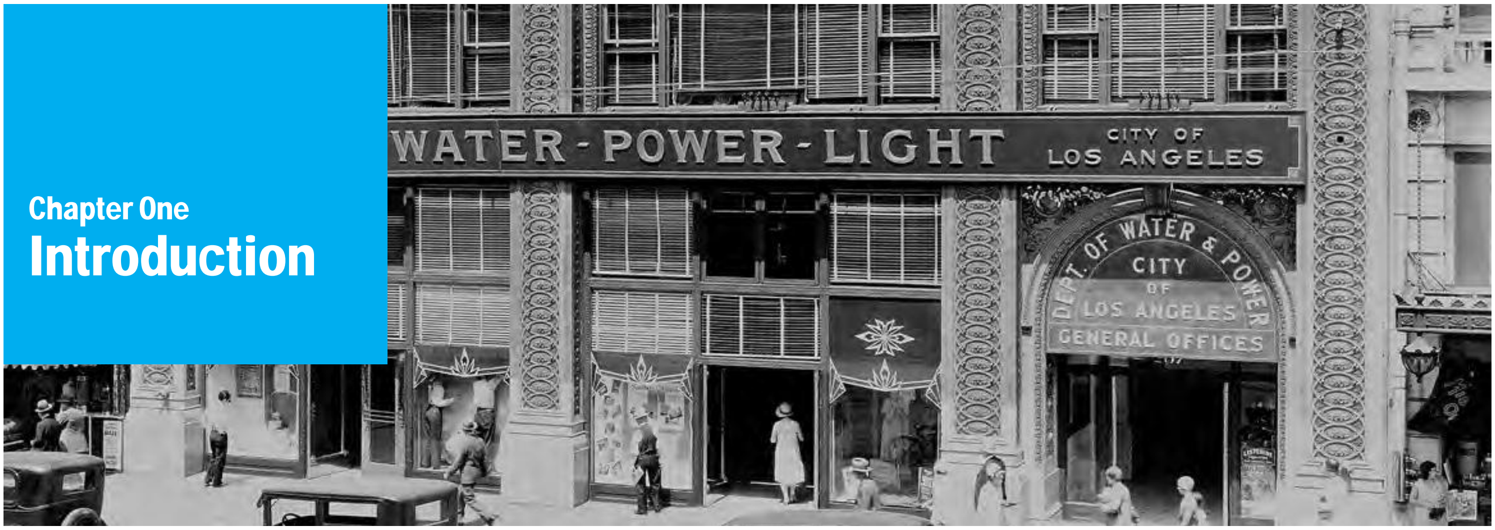
- **Responsible Parties Funding** - LADWP may be able to recover some of the costs for groundwater cleanup from those parties deemed responsible for the contamination.

ES-8 Conclusion

LADWP's 2015 Urban Water Management Plan is not only designed to meet the current requirements of the UWMP Act, but also demonstrate LADWP's commitment to provide a reliable and sustainable water supply over the next 25 years as well. It outlines a detailed plan for achieving the targets established in ED5 and pLAn for increasing water conservation and reducing dependence on imported supplies. It defines an evolving water supply portfolio that includes significant increases in both water conservation and local water supplies. It addresses confidence in the water supply by analyzing the uncertainties associated with climate change and integrating this analysis into water supply plans. Finally, it reinforces the need to address the water/energy nexus and continuing efforts to reduce carbon footprint. It is important to note that planning and investing in water reliability is an ongoing process that includes continuously evaluating the most recent conditions, updating plans, and sharing these plans with the community. The 2015 UWMP provides a snapshot of LADWP's ongoing efforts to ensure future water reliability for the residents and businesses of Los Angeles. With its current water supplies, planned future water conservation, and planned future water supplies, LADWP has available supplies to meet all demands under all three hydrologic scenarios through the 25-year planning period covered by this UWMP.

Chapter One

Introduction



1.0 Overview

In 1902, the City of Los Angeles (City) had a population of approximately 146,000 residents and formed a municipal water system by acquiring title to a private water company. In 1925, the Los Angeles Department of Water and Power (LADWP) was established by city charter. LADWP met the City's increasing need for water resources as Los Angeles developed into the nation's second largest city with nearly 4.0 million residents, encompassing a 469-square-mile area. As the largest municipal utility in the nation, LADWP delivers safe and reliable water and electricity services at an affordable price to the residents and businesses of Los Angeles.

Faced with increasing demands for additional water supplies and multi-year drought conditions, LADWP and other water agencies in Southern California are addressing the challenge of providing a reliable water supply for a growing population. Since the completion of the 2010 Urban Water Management Plan (UWMP), multiple City goals and policy objectives have reshaped future plans for water supply in Los Angeles. In January 2014, Governor Brown proclaimed a drought state of emergency and directed state officials to take all necessary actions to prepare for the consequences of ongoing drought. In April 2014, Governor Brown issued an Executive Order to increase state drought actions. In October 2014, Mayor Eric Garcetti issued Executive Directive 5 (ED5), which mandated City goals and actions in response to the drought. In April 2015, LA's Sustainable City pLAn (pLAn) was released establishing short-term and long-term targets for the City to strengthen and promote sustainability. Within the pLAn category of local water, a multi-faceted approach to reducing water use and developing a locally sustainable water supply was developed. LADWP plans to meet the City's water needs while complying with these various initiatives through the following actions:

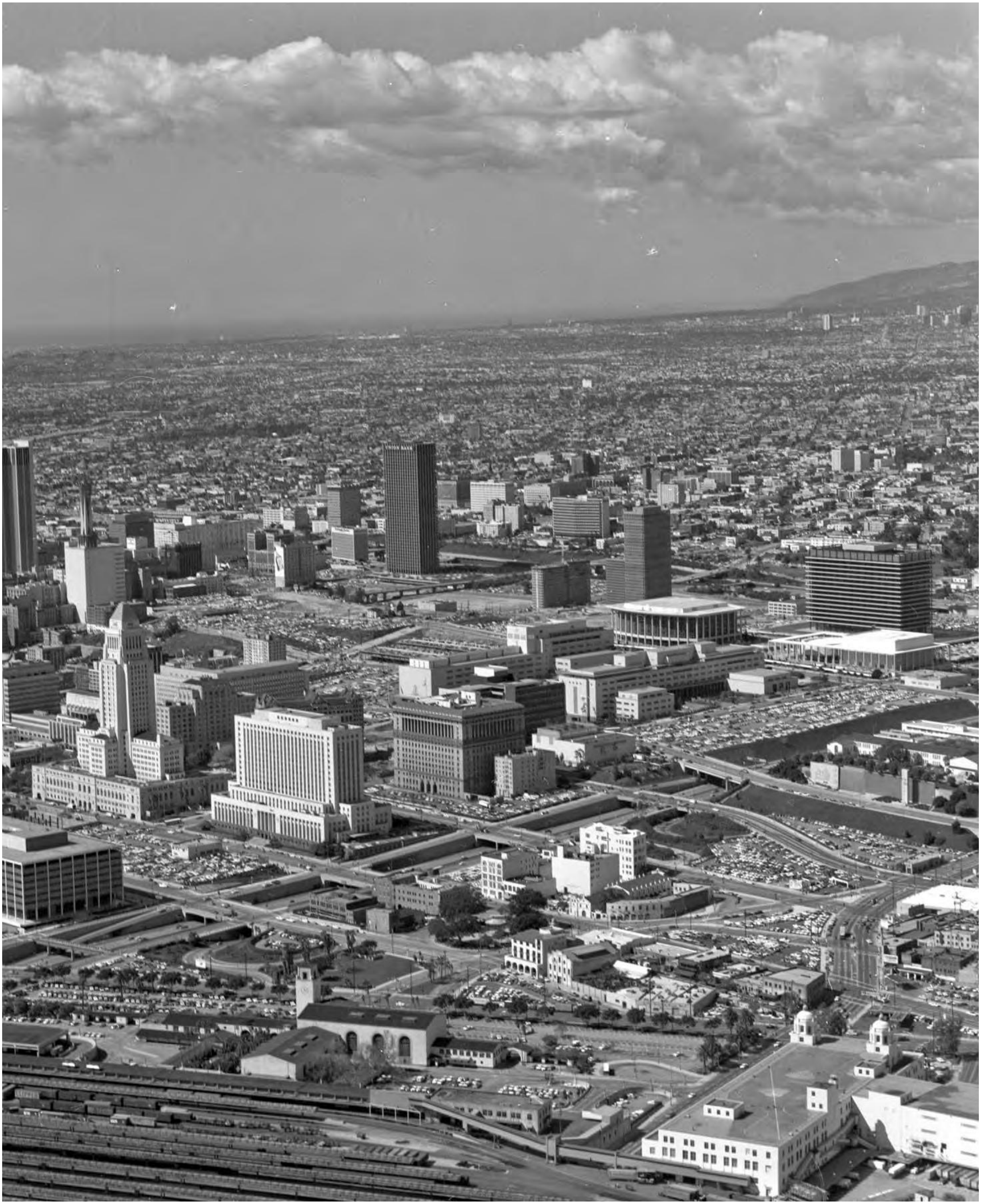
- Achieving significant water conservation enhancements, stormwater capture, and water recycling projects to increase supply reliability, reduce imported water purchases, and increase locally produced water.

- Remediating contamination of the San Fernando Groundwater Basin.

- Ensuring continued reliability of the water supplies from the Metropolitan Water District of Southern California (MWD) through active representation of City interests on the MWD Board.

- Maintaining operational integrity of the Los Angeles Aqueduct and in-City water distribution systems.

- Meeting or exceeding all Federal and State standards for drinking water quality.



1.1 Purpose

The LADWP's 2015 UWMP serves two purposes: (1) as a master plan for water supply and resources management consistent with the City's goals and policy objectives, and (2) for compliance with the California Water Code (CWC) and the California Urban Water Management Planning Act (Act).

1.1.1 UWMP Requirements and Checklist

This 2015 UWMP complies with the Act's Sections 10610 and 10656 of the CWC, and details how LADWP plans to meet all of the City's water supply goals and objectives while serving customer's water needs. The Act became effective on January 1, 1984 and mandates that every urban water supplier that provides municipal and industrial water to more than 3,000 customers (or supplies more than 3,000 acre-feet per year) prepare and adopt a UWMP every five years in compliance with state guidelines and requirements.

The Act was originally developed due to concerns regarding potential water supply shortages throughout California. It required information that focused primarily on water supply reliability and water use efficiency measures. Since its original passage in 1983, there have been several amendments with the most recent amendment adopted in 2014. Some of the recent amendments include: extension of the submittal date from December 31, 2015 to July 1, 2016 (Assembly Bill (AB) 2067), a requirement for narrative description of water demand measures implemented over the past five years and future measures planned for implementation to meet 20 percent demand reduction targets by 2020 (AB 2067), standard methodology for calculating distribution system water loss (Senate Bill (SB) 1420), mandatory electronic filing of UWMPs (SB 1420), voluntary reporting of passive conservation savings (SB 1420), voluntary reporting of energy intensity (SB 1036), and a requirement to analyze and define water features that are artificially supplied with water (CWC Section 10632). A copy of the Act is provided in Appendix A. A checklist cross-referencing Act requirements to applicable pages in this UWMP is provided in Appendix B.

With the passage of SB 610 and 221 in 2001 and SB x7-7 in 2009, UWMPs took on even more importance. SB 610 and 221 require counties and cities to consider the availability of adequate water supplies for certain new large developments and to have written verification of sufficient water supply to serve them. UWMPs are identified as key source documents for this verification. Based on these statutes LADWP prepares individual Water Supply Assessments for these new large developments. SB x7-7, the Water Conservation Act of 2009, requires water agencies to reduce per capita water use by 20 percent by 2020. Water users were required to set an interim target for 2015 and a final target for 2020 using one of four methodologies to calculate per capita water use. Excluding certain exceptions, failure to meet adopted targets will result in the ineligibility of a water supplier to receive state grants or loans.

LADWP's 2015 UWMP not only meets the current requirements of the Act, but also serves as the City's master plan for water supply and resource management. The UWMP helps guide policy makers both in the City and at the City's wholesale water provider the Metropolitan Water District of Southern California (MWD). The plan also provides information on the City's water supplies to the citizens of Los Angeles. The UWMP presents the basic policy principles that guide LADWP's decision-making process to secure a sustainable water supply for Los Angeles.

1.2 Water Supply Planning Developments

LADWP has a long history of working to ensure that its customers have reliable water. These efforts date back to the early 20th century with the building of the Los Angeles Aqueduct (LAA). City investments in regional supplies, water rights, aqueducts, reservoirs, conservation, and more recently in recycled water, groundwater basin remediation, and stormwater capture have allowed residents to enjoy a reliable water supply. Sound planning and timely investments in water supply infrastructure and water use efficiency have played a critical role in meeting the City's water needs, despite the region's semi-arid climate and growing population.

Over the last 30 years LADWP's water supply mix has changed to reflect significant reductions in LAA supplies due to environmental reallocations and periods of dry hydrology, as well as significant reductions in groundwater pumping due to contamination in the City's largest groundwater aquifer, the San Fernando Basin (SFB). Despite significant conservation, efficiency and water management efforts, reliance on purchased imported water has increased heavily due to various challenges facing other City water supply sources. As discussed in the associated sections of this UWMP, major challenges to LADWP's water supplies include:

- Groundwater contamination;
- Urbanization;
- Rising cost of LAA imported water;
- Reduced reliability of LAA and MWD imported supplies due to environmental constraints and obligations, competing demands for finite supplies, and climate change impacts, and
- Rising cost of and heavy reliance on MWD purchased imported water.

The year 2012 marked the start of a multi-year drought that by late 2013 would garner statewide attention. In January 2014, following the state's driest year on record, Governor Brown proclaimed a drought state of emergency. The continued dry conditions in California triggered immediate consequences, including: drinking water supplies becoming at risk in many communities; reduced agricultural production that would threaten the farming industry; low-income communities heavily dependent on agricultural employment would suffer heightened unemployment and economic hardship; threats to many endangered species; declining groundwater basins; declining surface reservoirs; declining flows in rivers and streams; and greatly increased risk of wildfires across the state. On April 25, 2014, the Governor directed the State Water Resources Control Board (SWRCB) to implement State regulations to help achieve 20 percent water use reduction Statewide. In response, on July 29, 2014, the SWRCB issued its Emergency Water Conservation Regulation (Emergency Regulation). The Emergency Regulation directed Californians and urban water suppliers to take actions to reduce water use which included:

- Requiring urban water suppliers to implement their water shortage contingency plans to a level where restrictions on outdoor watering are mandatory;
- Requiring urban water suppliers to report monthly water production to the SWRCB;
- Setting a list of prohibited water uses for all Californians

The Emergency Regulation was further expanded on March 17, 2015 to require urban water suppliers to implement their water shortage contingency plan to a level equivalent to 20 percent water use reduction and added additional prohibited uses to residential users as well as prohibitions to businesses.

With worsening drought conditions, on April 1, 2015, Governor Brown issued Executive Order B-28-14 directing the SWRCB to establish regulations to mandate 25 percent water use Statewide. In response, on May 18, 2015, the SWRCB amended its Emergency Regulation to mandate conservation targets for urban water suppliers to achieve a 25 percent water use reduction Statewide for the period from June 2015 through February 2016. Urban water suppliers' conservation targets were established based on their per capita potable water use from July through September 2013. Thanks to a long-standing history of conservation achievements and its low per capita potable water use, LADWP was assigned a 16 percent water use reduction target by the SWRCB.

LADWP was able to stay in compliance with the SWRCB's mandate through multiple short and long-term conservation strategies developed to meet the City's sustainability initiatives. In October 2014, Mayor Eric Garcetti issued Executive Directive No. 5, a strategy to comply with state-wide conservation orders and address the City of Los Angeles' ongoing challenges to water supply reliability. ED5 set a water related framework for the subsequent Los Angeles Sustainable City pLAn (pLAn), which was issued by Mayor Garcetti in April 2015. The pLAn set short and long-term targets for the City to strengthen and promote sustainability. The pLAn addressed water related challenges within the Environment section under Local Water, and set a multi-faceted approach to reducing water use and developing a locally sustainable water supply. The City's ED5 and pLAn form the guidance documents for the 2015 UWMP's water use reduction and local supply development goals.

1.2.1 Mayor's Executive Directive No. 5

In response to ongoing extreme drought conditions that started in 2012, on October 14, 2014, Mayor Eric Garcetti issued Executive Directive No. 5, Emergency Drought Response – Creating a Water Wise City (ED5). ED5 addresses the City's heavy reliance on imported water, which represents up to 80 percent of the City's water supply. Over reliance on imported water is not only expensive, but could create hardships for Los Angeles if supplies are curtailed. Potential challenges to imported supplies include drought, seismic events, and climate change. Therefore, reducing over reliance on imported water is of critical importance to the City. In response to these short and long term threats, ED5 set the following goals utilizing a FY 2013/14 baseline:

- Reducing per capita potable water use by 20 percent by 2017;
- Reducing LADWP's purchase of imported potable water by 50 percent by 2024; and
- Creating an integrated water strategy to increase local water supplies and improve water security in the context of climate change and seismic vulnerability.

To address the immediate drought conditions, ED5 established actions to curtail water use. ED5 recommended immediate actions for all city residents, these voluntary actions included: reducing watering from three to two days per week, replacing turf lawns with native climate-appropriate landscaping, replacing high water use plumbing fixtures and appliances, and ensuring pools have covers.

ED5 also established a list of mandates for City departments to reduce their water use and lead by example. All City departments were tasked with reducing their water use via 2-day watering restrictions, making landscaping changes, and initiating public education on department conservation measures. The general fund departments were also tasked with developing plans to convert City car wash facilities and public golf courses to recycled water, developing a plan to convert street medians to water efficient landscaping, and compiling conservation related changes to the building code for new and retrofitted buildings. LADWP was specifically tasked with increasing water conservation rebates, investigating new potential water conservation programs, reporting on leak detection and protection program, and reporting on City-owned facility water use and the impacts of climate change.

Specific timeframes and water use reduction targets were established in ED5 to increase water conservation. These targets are a 10 percent gpcd reduction by July 1, 2015, 15 percent reduction by January 1, 2016, and a 20 percent reduction by January 1, 2017. As of January 1, 2016, LADWP has met ED5's January 2016 target and is on track to meet the 20 percent reduction target in January 2017.

1.2.2 Sustainable City pLAn

On April 8, 2015, the Sustainable City pLAn (pLAn) was released establishing short-term and long-term targets for the City over the next 20 years in 14 categories to strengthen and promote sustainability of the environment, economy, and equity in Los Angeles. Water use in the City falls within the category of local water, which is within the environment framework, and lead by example directive. In addition, multiple facets of sustainability outlined in the pLAn are applicable to LADWP operations, including, but not limited to, carbon emission reduction and climate change leadership, preparedness and resiliency.

Local Water

Local water not only encompasses sustainability of local water supplies, but includes sustainability of rivers and beaches. pLAn has established the following vision for the local water category:

"We lead the nation in water conservation and source the majority of water locally."

A multi-faceted approach to developing a locally sustainable water supply was developed through the pLAn. The pLAn incorporates the targets established in ED No. 5 and further builds upon those targets to establish short-term, mid-term, and long-term goals.

Near term outcomes desired by **2017** include:

- Secure additional funding for SFB clean-up;
- Reduce average per capita potable water use by 20 percent from FY 2013/14;
- Establish a Water Cabinet to implement key local water policy;
- Expand recycled water production by at least 6 million gallons per day (mgd);
- Replace 95 miles of water pipe infrastructure;
- Identify funding mechanism(s) to implement Enhanced Watershed Management Programs necessary for Municipal Separate Storm Sewer System (MS4) permit compliance.

Mid-term and long-term desired outcomes related to water supplies include:

2025

- Reduce imported water purchases by 50 percent from FY 2013/14
- Reduce average per capita water use by 22.5 percent from FY 2013/14

2035

- Source 50% of water locally, including 150,000 AFY of stormwater capture
- Reduce average per capita water use by 25 percent from FY 2013/14

Five strategies with multiple priority initiatives were identified in the pLAn to meet these targets.

1. Create an integrated water strategy for Los Angeles
    a. Create Water Cabinet
    b. Develop integrated stakeholder-driven “One Water Plan”, a comprehensive water strategy for Los Angeles
2. Ensure safe, secure, and reliable drinking water supply and system
    a. Clean the SFB
    b. Ensure the City obtains its fair share of California Water Bond Funding
    c. Prioritize water system funding for local water supply development and infrastructure reliability
    d. Improve pipe infrastructure quality
    e. Expand recycled water production, treatment, and distribution to incorporate indirect or direct potable reuse (IPR/DPR)
    f. Educate public on need/benefits of IPR and DPR
3. Reduce per capita potable water use and increase recycled water
    a. Execute key conservation steps in ED No. 5
    b. Expand scope and financing of LADWP’s turf replacement incentive program
    c. Implement and expand other LADWP conservation incentives
    d. Educate and engage residents and businesses through on-going awareness, social media, and action campaigns
    e. Benchmark customer use and recognize innovative water-reduction initiatives
    f. Develop more water and wastewater rate tiers to encourage conservation
    g. Ensure private buildings are retrofitted with high efficiency, water conserving fixtures
    h. Revise building code to encourage water use reduction, on-site water reuse, and recycling
    i. Produce at least 6 mgd of advanced reuse recycled water at Terminal Island Wastewater Reclamation Facility
    j. Expand customer use of recycled water and expand purple pipe infrastructure
4. Increase stormwater capture and protect marine life
    a. Identify funding mechanism(s) to implement the Enhanced Watershed Management Plans necessary for MS4 compliance
    b. Expand use of permeable pavement in large infrastructure projects (e.g. LAX)
    c. Expand number of green infrastructure sites and green streets (e.g. bioswales, infiltration, cut-outs, permeable pavement, and street trees)Expand rain barrel program
    d. Eliminate once through cooling to improve water quality and protect marine life
    e. Lead by example through increased municipal water conservation
    f. Increase municipal conservation through actions in ED No. 5

Lead by Example

Lead by example is based on the premise that the City’s government should lead by example to inspire others to follow, including residents. The pLAn has established the following vision for the lead by example category:

"We have a municipal government that leads by example throughout every department in the City of Los Angeles."

Near term outcomes desired by 2017 specifically related to water supplies include:

- Reduce water use at City facilities and proprietary departments by 20 percent

There are additional near-term outcomes more general to City operations, but applicable to LADWP, including reducing greenhouse gas emission.

Mid-term and long-term desired outcomes specifically related to water supplies include:

2025

- Reduce municipal water use by at least 25 percent from FY 2012/13

2035

- Reduce municipal water use by at least 30 percent from FY 2012/13

Applicable strategies and priority initiatives are derived from ED No. 5 and were selected to meet the near, mid, and long-term outcomes:

1. Reduce municipal water consumption
    a. Convert road medians and parkway strips to low or no-water use landscaping
    b. Reduce potable water use by 10 percent in City parks
    c. Reducing watering to two times per week at City facilities
    d. Convert 85% of public golf courses acreage to recycled water
    e. Wash City vehicles only at facilities with 100 percent recirculated water
    f. Publish water use at each City-owned facility
    g. Retrofit municipal and proprietary buildings and adjacent landscapes
    h. Incorporate additional low water use and permeable materials into standard parkway guidelines
    i. Develop strategy to convert City lakes to recycled water and implement pilot

As part of the pLAn program annual reports will chart progress towards reaching overall goals and desired outcomes. Major updates to the pLAn will occur every four years. The local water vision, strategies, and priority initiatives outlined in the pLAn are integrated into this UWMP. Combined pLAn and ED No. 5 serve as a blueprint for creating sustainable water supplies to serve the future needs of the City, and outline responsible water resource management and planning.

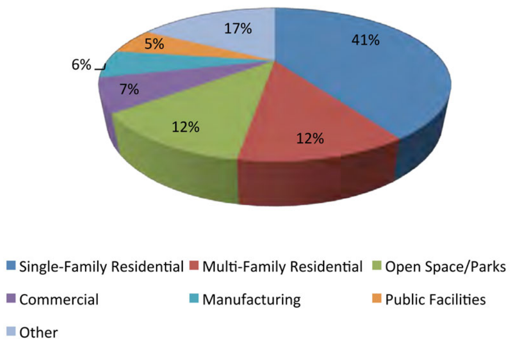
1.3 Service Area Description

In order to properly plan for water supply, it is important to understand the factors that influence water demands over time. These factors include land use, demographics, and climate.

1.3.1 Land Use

The City of Los Angeles is comprised of approximately 300,117 acres. Residential development constitutes approximately 53 percent of the total land use within the City. Within the residential land use category, single-family residential is the largest at approximately 122,000 acres or 41 percent of the total land use within the City. Multi-family residential is at approximately 35,000 acres or 12 percent of the total land use within the City. After residential use, open space/parks is the second largest land use within the City at approximately 12 percent. Commercial, public facilities and manufacturing land uses combined account for approximately 19 percent of the total. Public facilities include land uses such as libraries, public schools, and other government facilities. Exhibit 1A provides a breakdown of the land uses within the City of Los Angeles. The "Other" category includes City port and airport master plans, transportation, freeways, parking, rights of way, hillsides, and other miscellaneous uses that are not zoned.

Exhibit 1A
City of Los Angeles Land Uses



Land Use Types	Acres
Single-family Residential[1]	122,206
Multi-family Residential	35,358
Subtotal Residential	157,564
Open Space/Parks	35,492
Commercial	21,077
Manufacturing	17,706
Public Facilities	16,994
Other[2]	51,284
Total	300,117

Source: http://planning.lacity.org/

1. Includes agriculture use as defined by City of Los Angeles, Department of City Planning
2. Includes specific plans, transportation, freeways, parking, rights of way, hillsides, and other miscellaneous areas that are not zoned.

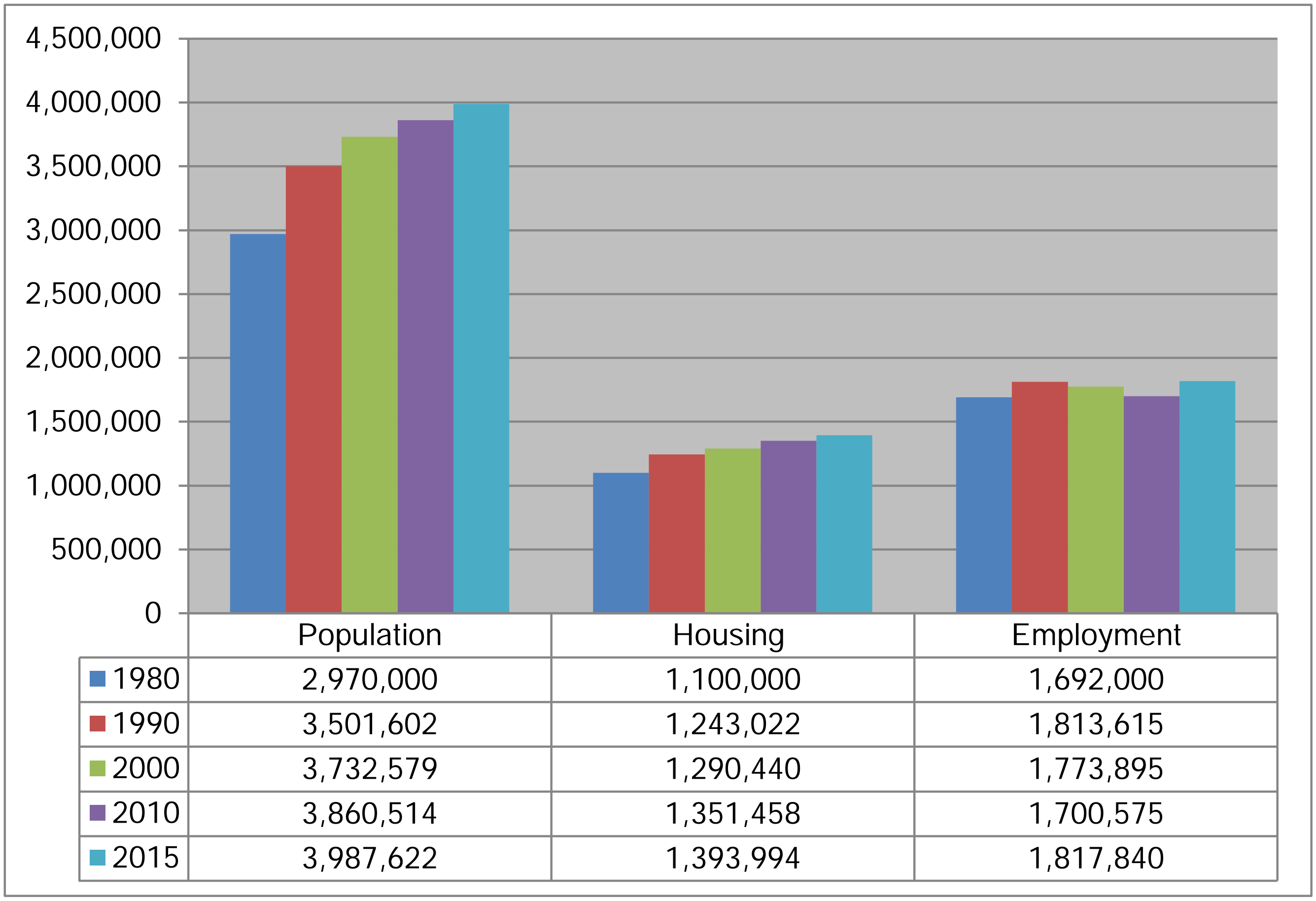
1.3.2 Demographics

Over 3.9 million people reside in the LADWP service area, which is slightly larger than the legal boundary of the City of Los Angeles. In addition to the City, LADWP also provides water service to portions of West Hollywood, Culver City, Universal City, and small parts of the County of Los Angeles.

The population within LADWP's service area increased from 2.97 million in 1980 to 3.99 million in 2015, representing an average annual growth rate of approximately 1 percent. The total number of housing units increased from 1.10 million in 1980 to 1.39 million in 2015, representing an average annual growth rate of 0.8 percent. During this time, average household size increased from 2.7 persons in 1980 to 2.77 persons in 2015. Employment grew by about 0.7 percent annually from 1980 to 1990, but declined from 1990 to 2010 as a result of two economic recessions. The first recession began in 1991 and was followed by another larger recession beginning in 2008. Only recently has employment begun to return to the employment level experienced in 1990. Overall, employment decreased by about 0.3 percent annually from 1990 to 2010 and between 2010 and 2015 increased by approximately 1.4 percent reflecting an improved economy. Exhibit 1B summarizes the historical demographics for the LADWP service area.

Demographic projections were provided for the LADWP service area by MWD who received projected demographic data from Southern California Association of Governments (SCAG). SCAG allocated its 2012 Regional Transportation Plan (RTP) demographic data into water service areas for MWD's member agencies. For population estimates, SCAG relies on the California Department of Finance (DOF). However, after the 2000 U.S. census and before the 2010 U.S. census, there was a large gap between DOF and U.S. Census population estimates. DOF released revised historical population estimates resetting the historical demographics for

Exhibit 1B
Historical Demographics for LADWP Service Area



	Population	Housing	Employment
🟦 1980	2,970,000	1,100,000	1,692,000
🟥 1990	3,501,602	1,243,022	1,813,615
🟩 2000	3,732,579	1,290,440	1,773,895
🟪 2010	3,860,514	1,351,458	1,700,575
🟦 2015	3,987,622	1,393,994	1,817,840

the period 2000 to 2010 based on results from the 2010 U.S. Census. Demographic data for 2010, as provided in this UWMP, has been adjusted by SCAG based on the revised DOF data and therefore does not match the 2010 data contained in the 2010 UWMP. Exhibit 1C summarizes these demographic projections for the LADWP service area.

LADWP's service area population is expected to continue to grow over the next 25 years at a rate of 0.5 percent annually. While this is substantially less than the historical 1.0 percent annual growth rate from 1980 to 2010, it will still lead to approximately 493,200 new residents over the next 25 years. According to SCAG's 2012 RTP, total housing is expected to grow at a slightly higher rate than population over the next 25 years at 0.8 percent annual growth versus 0.5 percent annual growth for population, and it is anticipated that household size will decline over the projection period.

The 2012 RTP projects that by 2040 the average household size will decrease to 2.54 persons per household. Throughout the projection period, multi-family housing units are expected to increase at three times the rate of single-family housing units (1.32 percent annual growth vs. 0.41 percent annual growth).

Employment is expected to increase by 0.4 percent annually throughout the projection period. This growth is primarily driven by the current and long-term opportunities available from the economic base within the five-county metropolitan region of Southern California. The

Exhibit 1C
Demographic Projections for LADWP Service Area

Demographic	2020	2025	2030	2035	2040
Population	4,026,891	4,168,131	4,210,042	4,351,408	4,441,545
Housing					
Single-Family	650,746	635,348	652,379	675,540	682,412
Multi-Family	828,744	900,523	940,549	973,978	1,031,239
Total Housing	1,479,490	1,535,871	1,592,928	1,649,518	1,713,651
Persons per Household	2.66	2.66	2.59	2.58	2.54
Employment					
Commercial	1,704,864	1,749,994	1,788,566	1,807,774	1,869,383
Industrial	136,023	135,594	134,061	131,686	131,285
Total Employment	1,840,887	1,885,588	1,922,628	1,939,460	2,000,667

Source: 2012 Regional Transportation Plan, Southern California Association of Governments

economic base is wide-ranging and includes professional and business services, wholesale and retail trade, manufacturing, public administration, financial service industries, information, transportation, warehousing, utilities, construction, education and health services, and leisure and hospitality. Over the 25-year forecast period, industrial growth is expected to slightly increase reaching a peak in 2020 and then gradually declining to 2040. Over the projection period industrial growth is expected to increase by less than 0.1 percent annually. Commercial employment is expected to increase by about 0.4 percent annually.

The 2015 UWMP presents demographic projections that are lower for population, lower for employment, and unchanged for housing, when compared to the data presented in the LADWP's 2010 UWMP. Although no overall change, the housing projection displays less single-family housing units and more multi-family housing units when compared to the 2010 UWMP. The demographic projections in the 2010 UWMP were based on SCAG's 2008 RTP. The current 2012 projections incorporate the latest population, households, and employment data from multiple local, state, and federal agencies. Projected 2012 RTP data reflect adjustments in future 2035 population growth related to the aforementioned demographic adjustments as a result of the 2010 U.S. Census; declining mortality, labor force participation, net immigration, and net domestic migration; slightly increasing overall fertility; household headship rates ranging slightly above to slightly below 2010 rates; and an employment shift from the manufacturing sector to the service sector. The SCAG 2012 RTP was adopted by the Regional Council of the SCAG on April 4, 2012. Exhibit 1D shows the differences between the SCAG demographic projections for the RTP in 2008 and 2012.

For the forecast year 2035, Los Angeles population was projected to be 4.47 million under the SCAG 2008 RTP and 4.35 million under the 2012 RTP, a difference of approximately 120,000. Housing was projected to be 1.64 million in 2035 under the SCAG 2008 RTP and slightly more under the SCAG 2012 RTP at 1.65 million. Employment was forecast to be less in 2035 under the newest RTP. It is projected to be 2.01 million under the SCAG 2008

RTP versus 1.94 million with the 2012 RTP. It is important to recognize that projected total employment under both the 2008 RTP and 2012 RTP continue to increase from 2010 to 2035. The 2012 RTP simply projects a lower rate of employment growth compared to the 2008 RTP. In a similar manner, the rate at which the population increases is expected to be lower with the 2012 RTP as compared with the 2008 RTP. Exhibit 1D compares these different demographic projections for the LADWP service area for the Year 2035.

Demographic projections are primary drivers of water demand forecasting. It is important to use the latest and best information available, as the accuracy of these projections may lead to an over-estimate or under-estimate of future water demands. During the UWMP planning process, LADWP used the latest available demographic projections for its water demand forecast. Currently, the latest available projections come from the 2012 RTP.

1.3.3 Climate

Weather in Los Angeles is considered mild, which is a major attribute that attracts businesses, residents, and tourists to the City. Because of its relative dryness, Los Angeles' climate has been characterized as Mediterranean. Exhibit 1E provides a summary of average monthly rainfall, maximum temperatures, and evapotranspiration readings.

The City's average monthly maximum temperature is 75 degrees Fahrenheit based on the period of 1990-2014. This is based on data from the Los Angeles Downtown weather station. Total precipitation averages 14.25 inches per year, with over 92 percent of this total amount typically falling during the period of November through April. The standard annual average evapotranspiration rate (ETo) for the Los Angeles area is 45.47 inches per year. ETo measures the loss of water to the atmosphere by

Exhibit 1D
Comparison of SCAG Demographic Projections for LADWP Service Area Between 2008 and 2012 RTP Forecasts for Year 2035

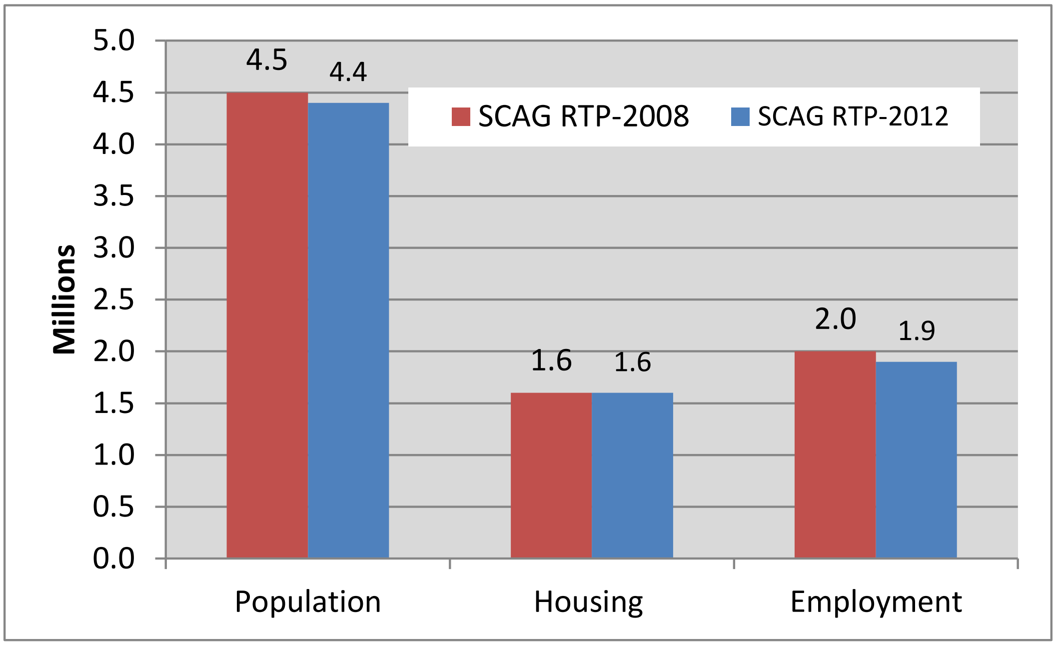


Exhibit 1E
Average Climate Data for Los Angeles 1990-2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temperature (ºF)[1]	69	68	70	73	75	78	83	84	84	79	73	68	75
Average Precipitation (inches)[1]	3.17	3.87	2.21	0.71	0.33	0.06	0.01	0.01	0.06	0.63	0.75	2.42	14.25
Average Eto (inches)[2,3]	2.03	2.26	3.53	4.27	4.96	5.24	5.89	5.60	4.53	3.25	2.17	1.74	45.47

1. 1990-2014, Los Angeles Downtown USC Weather Station, GHCND:USW00093134
2. Average of Glendale (Station Id. 133), Chatsworth (Station Id. 215), and Long Beach (Station Id. 174)
3. wwwcimis.water.ca.gov

evaporation from soil and plant surfaces and transpiration from plants. ETo serves as an indicator of how much water plants need for healthy growth.

1.3.4 Water Demand and Supply Overview

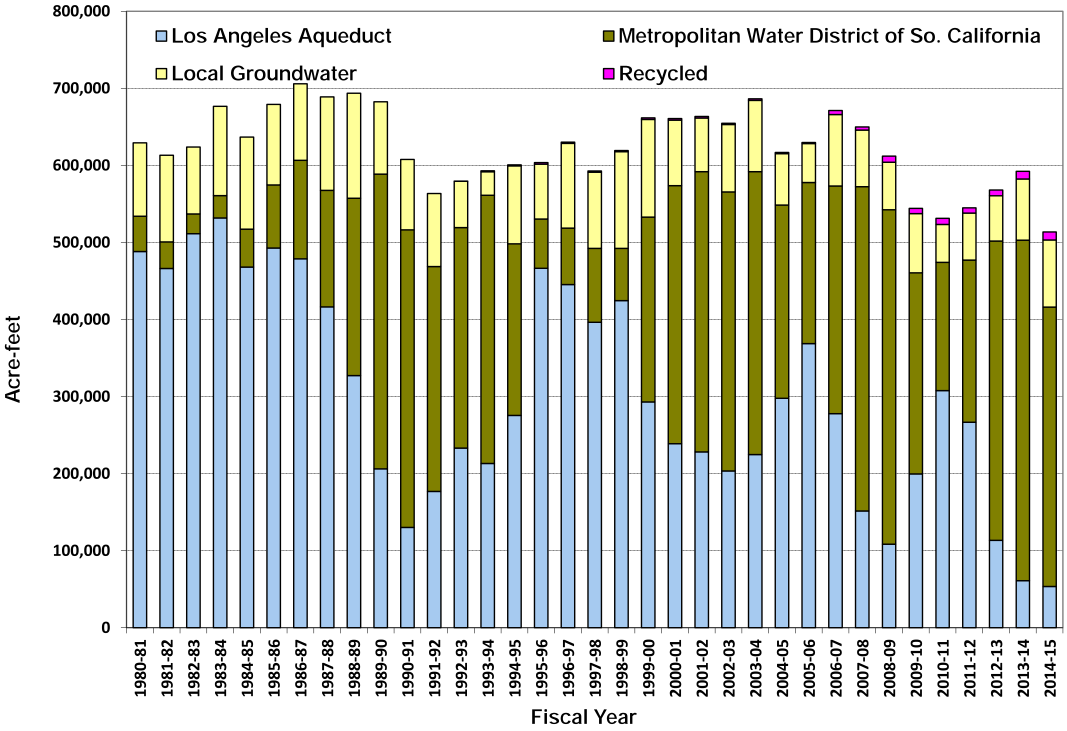
LADWP maintains historical water use data separated into the following categories: single-family residential, multi-family residential, commercial, industrial, government, and non-revenue water. Single-family residential water use is the largest category of demand in LADWP's service area, representing about 37 percent of the total. Multifamily residential water use is the next largest category of demand, representing about 28 percent of the total. Industrial use is the smallest category, representing only 3 percent of the total demand. Non-revenue water is the difference between total water delivered to the city and total water sales and has averaged 7 percent in recent years. Chapter 2 – Water Demands provides an in-depth look at water demand trends and projections for the next 25 years.

Primary sources of water for the LADWP service area are the LAA, local groundwater, and imported supplemental water purchased from MWD. An additional fourth source, recycled water, is becoming a larger part of the overall supply portfolio. Water from the LAA and MWD is classified as imported because it is obtained from outside LADWP's service area. Groundwater is local and obtained within the service area. Historical supply sources are under increased multiple constraints including minimal snowfall, potential impacts of climate change, groundwater basin contamination, and reallocation of water for environmental concerns. To mitigate these impacts on supply sources, LADWP is developing a path towards sustainability as outlined in ED No. 5 and the pLAn by accelerating investments in conservation, water recycling, stormwater capture, and local groundwater development and remediation.

The primary water supply sources are vital to maintaining LADWP's water system reliability. Pressure on one resource, such as the recent minimal snowfall in the Eastern Sierra Nevada Mountains, results in an increased reliance on another resource, such as purchased MWD water. Supplies available from each source are determined using computer models in an attempt to balance total projected supplies with projected demands. Exhibit 1F illustrates historical water supplies from FY 1980/81 to 2014/15. Over the last ten years, demands have undergone a drastic reduction from a peak of 670,970 AFY in FY 2006/07.

Several sequences of multi-year drought have led to diminishing supplies and increased efforts in conservation. Most recently, the start of a multi-year drought in 2012 resulted in diminished supplies from the LAA and historically heavy reliance on purchased MWD water. This drove increased efforts in conservation that resulted in a 22 percent demand reduction in 2014/15 from 2006/07. Reliance on MWD reached a peak in FY 13/14 as a result of limited LAA supplies due to minimal snowfall in the Eastern Sierra Nevada Mountains. Supplies in 2014/15 totaled 513,540 AF with 10 percent from the LAA, 17 percent from local groundwater, 71 percent from MWD, and 2 percent from recycled water. The five-year water supply averages (FY 20010/11 to FY 2014/15) included the following: 29 percent from the LAA, 12 percent from local groundwater, 57 percent from MWD, and 2 percent from recycled water. The imported water (LAA water plus MWD water) supplied over the last five years totaled, on average, approximately 87 percent of the City's demands.

Exhibit 1F
LADWP Historical Water Supply Sources FY 1980/81 to 2014/15



Chapter Two

Water Demand

2.0 Overview

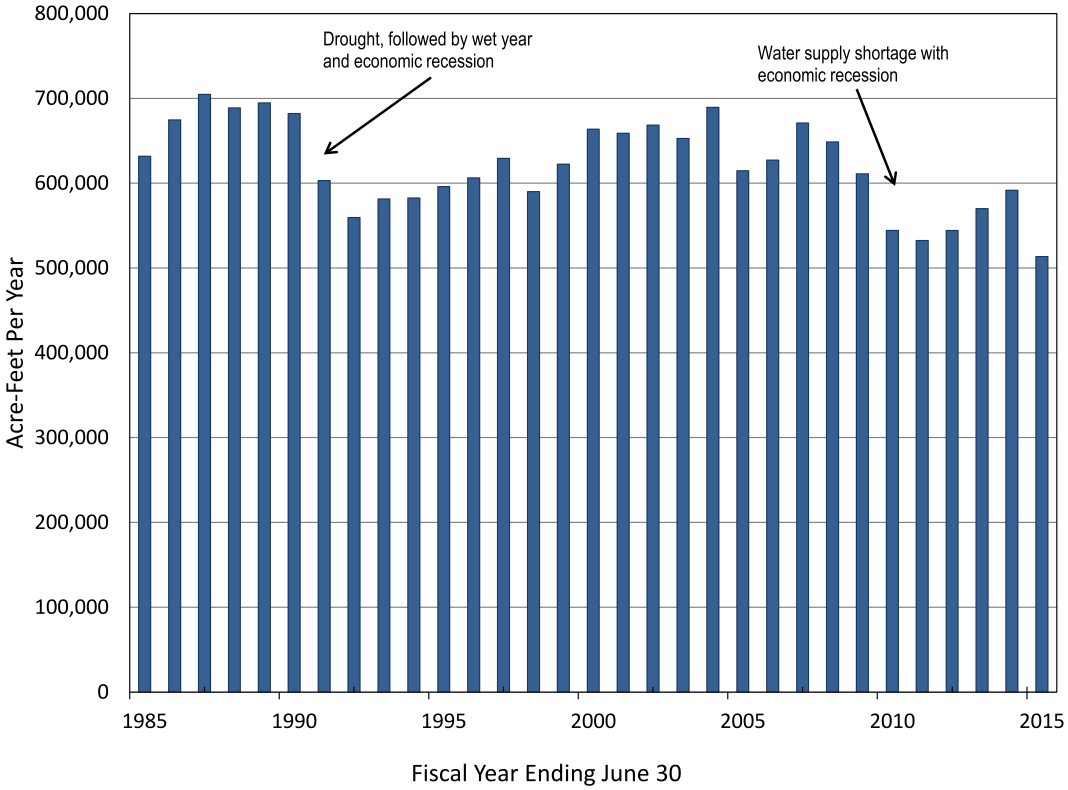
In order to properly plan for water supply, it is important to understand water demands and the factors that influence them over time. LADWP maintains historical water use data separated into six categories: single-family residential, multifamily residential, commercial, industrial, governmental, and non-revenue water. This categorization of demands allows better evaluation of trends in water use over time and more precise targeting of water conservation measures.

2.1 Historical Water Use

Exhibit 2A presents the historical water demand on LADWP. As seen in this exhibit, total water demand varies from year to year, and is influenced by a number of factors such as population growth, weather, climate change, water conservation, drought, and economic activity. In 2009, a 3-year water supply shortage coinciding with an economic recession required LADWP to impose mandatory conservation. Phase III water restrictions were put in place between June 2009 and August 2010. Following an ordinance amendment, Phase II implementation began on August 25, 2010 which allows outdoor watering three days per week. With the beginning of the economic recovery in FY 2009/10 and the end of the drought, customer demands began increasing. Starting in FY 2012/13 drought conditions returned, and the city experienced some of its driest weather on record. These conditions continued through FY 2014/15 and have triggered state and city mandatory conservation measures. As a result, FY 2014/15 water use decreased by 13 percent over FY 2013/14.

Prior to 1990, population growth in Los Angeles was a good indicator of total demands. From 1980 to 1990, population in the city grew at 1.7 percent annually. Water demands during this same ten year period also grew at 1.7 percent annually. However, after 1991, LADWP began implementing aggressive water conservation measures which prevented water demands from returning to pre-1990 levels. Average water demands in the last five years from FY 2010/11 to FY 2014/15 are about the same as they were 45 years ago despite over 1 million additional people now living in Los Angeles. This is evidenced by examining per person (or per capita) water use since 1990 (see Exhibit 2B). In FY 1989/90, per capita water use was 173 gallons per day (gpd). By FY 1999/00, per capita water use fell to 159 gpd, which represents an 8 percent reduction. In FY 2014/15, per capita water use (excluding recycled water) is estimated to be 114 gpd, which represents a 34 percent decrease from FY 1989/90—reflecting the state and city mandates to reduce water use in response to the record California drought.

Exhibit 2A
Historical Total Water Demand in LADWP's Service Area



2.1.1 Water Use by Sector

Exhibit 2C shows the breakdown of average total water use between LADWP's major demand categories and non-revenue water. The breakdown is shown in five-year intervals (except for FYE 2011-2014) for the past 24 years. Single-family residential water use comprises the largest category of demand in LADWP's service area, representing about 36 percent of the total. Multifamily residential water use is the next largest category of demand, representing about 30 percent of the total. Commercial, Industrial, and Institutional/Governmental (CII) water use combined represents 29 percent of the total. Finally, Non-revenue use is the smallest category, representing the remainder of the total demand. Although total water use has varied substantially from year to year, the breakdown in percentage of total demand between the major demand categories has not.

Exhibit 2B
Historical Per Capita Water Use in LADWP's Service Area

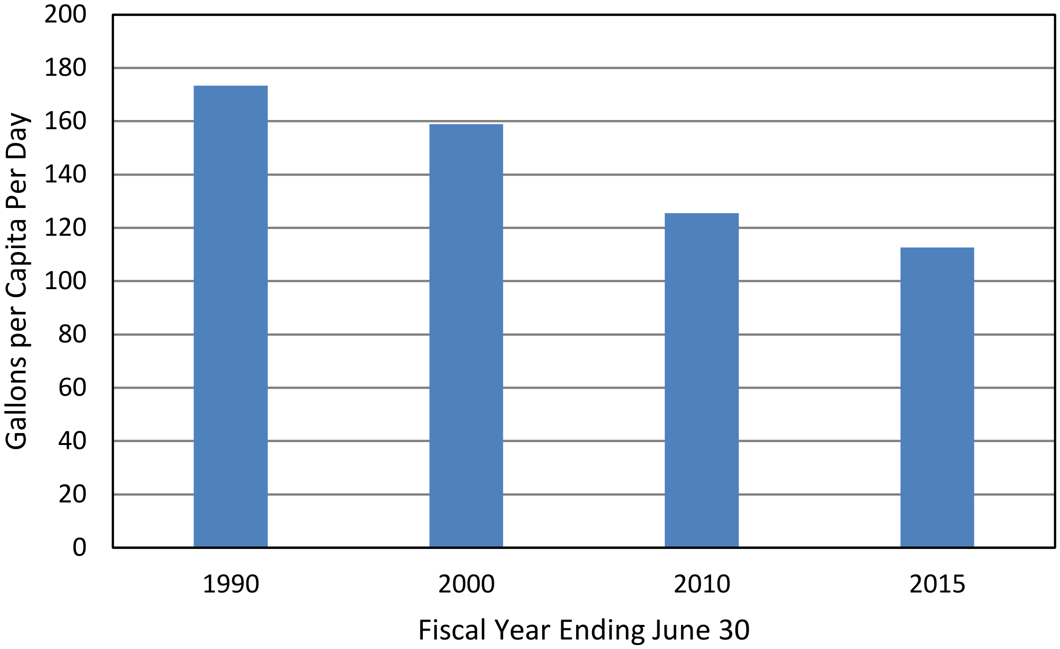


Exhibit 2C
Breakdown in Historical Water Demand by Customer Class

Fiscal Year Ending Average	Single-Family		Multi-Family		Commercial		Industrial		Government		Non-Revenue		Total
	AF	%	AF	%	AF	%	AF	%	AF	%	AF	%	AF
2011-2014	209,651	37%	165,364	29%	98,994	17%	17,663	3%	42,543	8%	32,774[1]	6%	566,990
2006-2010	236,154	38%	180,277	29%	106,964	17%	23,196	4%	42,956	7%	30,617	5%	620,165
2001-2005	239,754	37%	190,646	29%	109,685	17%	21,931	3%	41,888	6%	52,724	8%	656,628
1996-2000	222,748	36%	191,819	31%	111,051	18%	23,560	4%	39,421	6%	33,696	5%	622,295
1991-1995	197,322	34%	177,104	30%	110,724	19%	21,313	4%	38,426	7%	39,364	7%	584,253
24-Year Average	221,126	36%	181,042	30%	107,484	18%	21,533	4%	41,047	7%	39,100	6%	611,331

1. Calculated using AWWA Water Audit worksheet

Water Loss Audit

Non-revenue water consists of unbilled authorized consumption and water losses. Unbilled authorized consumption is the volume of non-revenue water for uses such as mainline flushing to improve water quality and firefighting, etc. Water losses are broken down into two categories: apparent losses and real losses. Apparent losses include meter inaccuracies and theft. Real losses are piping distribution system leakage.

Non-revenue water has significantly decreased in recent years. In FY 2013/14 non-revenue water was estimated at 5.6 percent, based on the American Water Works' Association's (AWWA) Free Water Audit Software. The AWWA Water Audit worksheets for FY 2013/14 are provided in Appendix G. Historically, non-revenue water has averaged 5.9 percent of total water demand over the period FYE 1991-2014. This consistently low level of non-revenue water over the last 24 years indicates that LADWP has an efficient, well-maintained water system. LADWP is committed to continuing to reduce its non-revenue water loss percentages through its Water Loss Task Force, as is discussed in the Conservation Chapter (Chapter 3).

2.1.2 Indoor and Outdoor Water Use

In order to assess the potential for water use efficiency and accurately target conservation programs, it is important to accurately characterize water use in terms of indoor and outdoor demands. As with most water utilities, most of LADWP's customers do not have separate irrigation meters. A small fraction of LADWP's customers, mostly parks and golf courses, do have designated irrigation meters. Therefore, measuring indoor vs. outdoor water demands involves the use of other data and assumptions. In 2010, LADWP estimated total outdoor water use using two methods: (1) estimation of supplemental water needed for landscape irrigation in accordance with the Model Water Efficient Landscape Ordinance definition of an un-rehabilitated landscape; and (2) comparison of wastewater flows to total water consumption. The first method uses the following formula to estimate the water needed to supplement outdoor landscape irrigation beyond the effect of natural precipitation:

$$LW = (Eto - Eppt) \times 0.62 \times A \times ETAF$$

Where:

LW = Supplemental water needed for irrigation;

Eto = Reference evapotranspiration for Los Angeles;

Eppt = Effective precipitation;

0.62 = Conversion factor to gallons;

A = Total greenscape area; and

ETAF = Evapotranspiration (Et) adjustment factor

In 2007, an infrared analysis of the City was conducted as part of the City's Million Trees Program to determine tree canopy and landscape coverage. The infrared analysis methodology used two types of remotely sensed data, infrared imagery and aerial imagery to determine the total greenscape areas within the City. Results of this effort indicated that there were approximately 83,699 acres of greenscape in Los Angeles in 2007. The ETAF (or Et adjustment factor) of 0.8 for the City was derived from the types of plants to be irrigated and an assumed irrigation efficiency. It is consistent with the ETAF for non-rehabilitated landscapes as defined in the California Model Water Efficient Landscape Ordinance. The 2004-2007 average total water demand was selected as the basis for calculating outdoor water use percentage. This period was considered to be about average in terms of weather for Los Angeles and there were no irrigation restrictions in effect. Using the formula described previously, the supplemental water required for outdoor landscaping in the City was estimated to be 249,000 AFY. During this same period, total water demand averaged 647,000 AFY. Therefore, it is estimated that the City's total outdoor water use represents approximately 39 percent of the total demand.

The second method of estimating overall outdoor water use compares wastewater flows to total water consumption. Since wastewater flow represents indoor water use that flows into the sanitary sewer system, the difference between total water consumption and wastewater flows represents outdoor water use. However, groundwater infiltration and wet weather runoff may also enter sanitary sewer systems through cracks and/or leaks in the sanitary sewer pipes or manholes and results in overestimation of indoor water use. To minimize overestimation, only data from summer months were used to estimate average monthly wastewater attributable to indoor water use. In Los Angeles, the summer months typically have little or no measurable rainfall. Using the same pre-water restriction period of 2004-2007 selected in the first method, the average monthly wastewater flow (using only the summer months of June through September) yields approximately 365 million gallons per day (MGD) or 403,000 AFY of estimated indoor water use. Subtracting this estimated indoor water use from the total water consumption of 647,000 AFY results in an estimated total outdoor demand of 244,000 AFY or 38 percent, which is similar to the 39 percent obtained with the landscape irrigation method.

Therefore, two entirely different methods produced very similar results in estimating the total outdoor water use for the City.

To obtain an estimate of indoor vs. outdoor water use for each major billing category, a minimum-month method was used. Monthly water use for single-family, multifamily, commercial, industrial, and government was obtained for 2004-2007. The water use in the minimum month, usually one of the cool/wet winter months, is assumed to be predominantly indoor use. The difference between any selected month and the minimum month is attributed to outdoor water use. However, based on the two prior methods, a certain amount of outdoor water use occurs even during the minimum month. Therefore, estimates of the outdoor water use that occurs in the minimum month were developed for each major billing category. Then the outdoor use of each major billing category was totaled and compared with the total outdoor water use obtained from the previously described outdoor water demand calculations.

Exhibit 2D presents the estimated indoor and outdoor water use for the City using all three methods.

Exhibit 2D
Indoor vs. Outdoor Water Use in LADWP's Service Area

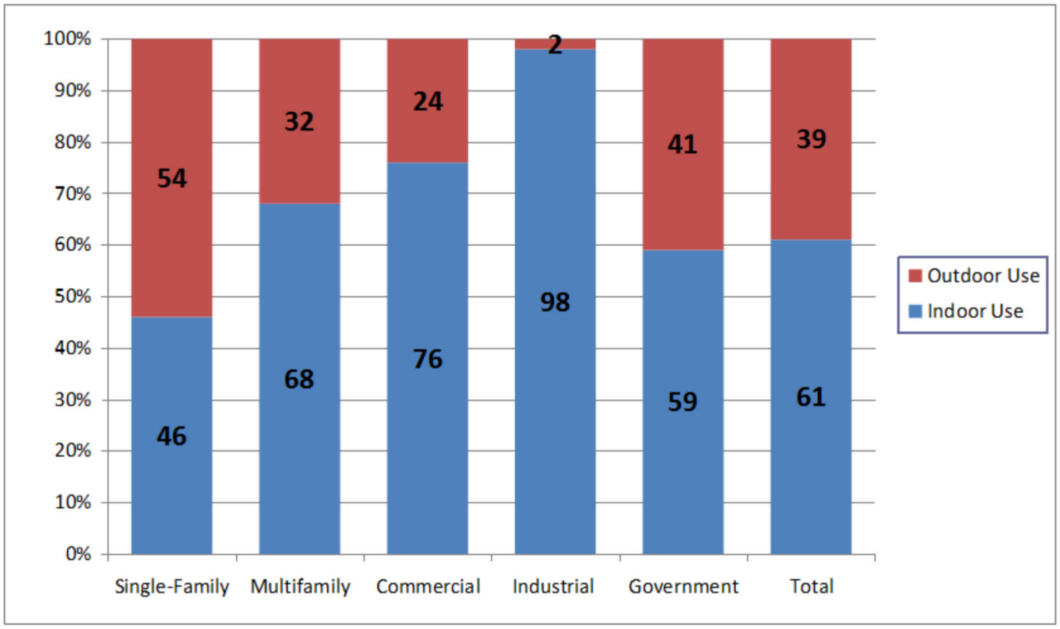
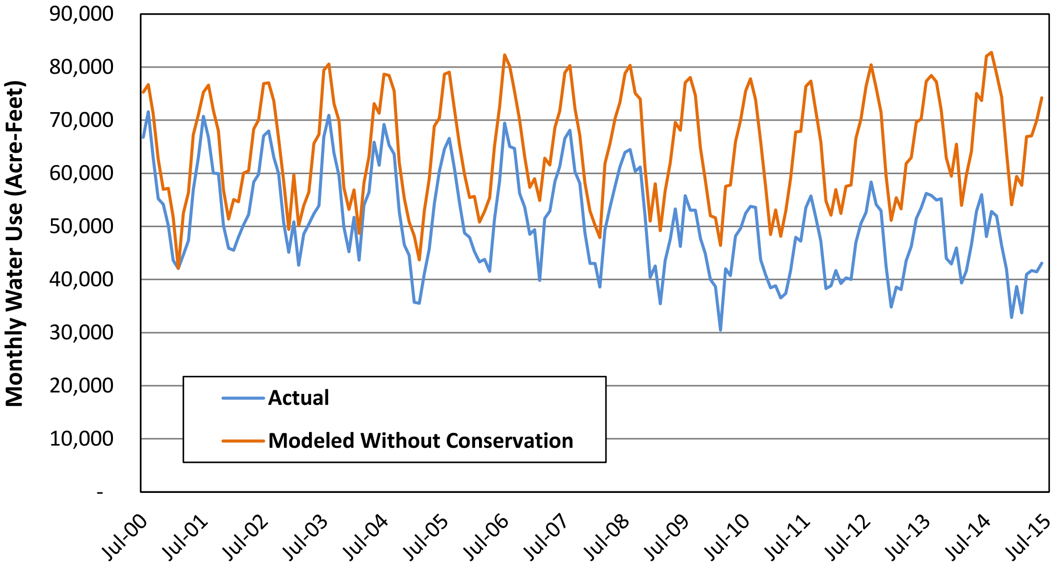


Exhibit 2E
Modeled vs. Actual Monthly Water Consumption for LADWP



It is important to note that the indoor and outdoor water use percentages will vary greatly during water shortage periods. For example, during the current drought, LADWP implemented multiple drought response strategies to meet both State and Local water use reduction mandates. One of LADWP's most reliable drought response strategies is its Emergency Water Conservation Plan. LA is currently in Phase II, which restricts outdoor watering for all customers to three days per week. The watering restrictions are estimated to reduce water use by up to 20 percent. In addition, LADWP has greatly expanded its Water Conservation Outreach Campaign to increase water conservation through indoor and outdoor customer behavior changes. The drought response strategies are primarily geared towards outdoor water use, so outdoor water use percent will typically be lower during drought years than what is shown above. Exhibit 2D represents average year conditions when drought response strategies are not in effect.

2.2 Quantification of Historical Water Conservation

Since 1990, LADWP has invested hundreds of millions of dollars in water conservation. These conservation investments include various programs such as high efficiency toilet rebates, commercial/industrial water audits, education and public outreach, and much more which are discussed in Chapter 3, Conservation. During periods of water shortage, public education and outreach are especially important and have contributed to significant reductions in water use.

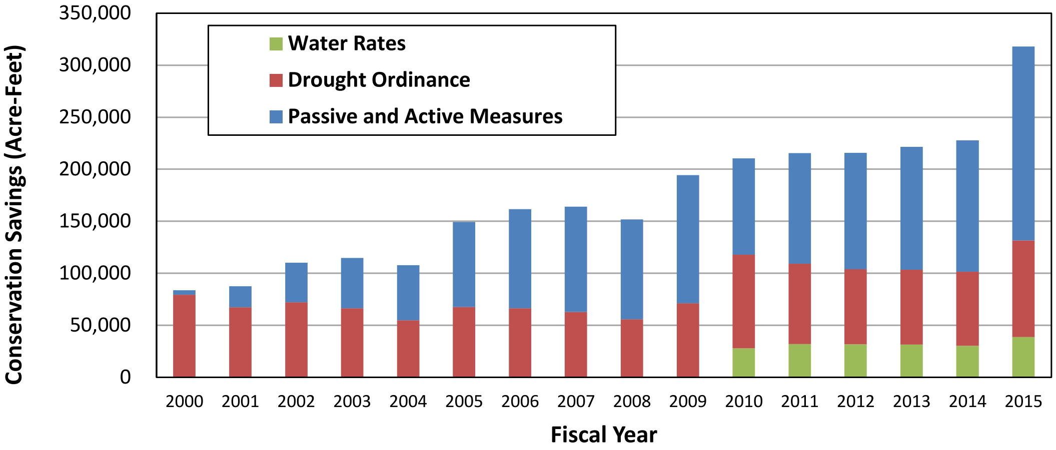
In an effort to quantify its water conservation efforts, LADWP developed a statistical Conservation Model that correlates total monthly water use in the City with variables of population, weather, price of water, passive and active conservation, periods of water use restrictions, and periods of economic recession. The model used data from January 2000 to December 2014, with a base year of 2000. The base year was established to measure all conservation from this point in time forward. Conservation includes: (1) passive conservation from plumbing codes and landscape ordinances; (2) customer responses to the price of water; (3) active conservation from rebate programs to incentivize customers to install high-efficiency water using fixtures; and (4) behavioral conservation in response to public messaging and mandatory water use restrictions in response to droughts. The model can predict what water demand would have been had no conservation occurred; given the actual weather, population and economic conditions that took place.

This modeled water consumption without conservation is then compared to actual water consumption—with the difference being attributed to water conservation. The model has an adjusted correlation coefficient value of 0.93, indicating a very high level of statistical correlation between the dependent variable water use and all of the explanatory variables.

Exhibit 2E presents modeled and actual monthly water consumption from 2000 to 2015. The total conservation increases every year since 2000 (base year), with the greatest levels of conservation occurring in the summer months.

Exhibit 2F summarizes the estimated annual water conservation by type, using the Conservation Model. Conservation attributed to water rates was a result of changes in tiered water rates and implementation of penalty water rates starting in 2008. Conservation attributed to drought ordinance reflects the levels of mandatory restrictions on outdoor watering imposed by LADWP. Conservation attributed to passive and active measures reflects savings from plumbing codes and landscape ordinances, as well as savings from rebate and other incentives provided by LADWP. Fiscal Year 2015 saw a significant increase in active and passive conservation among LA residences. This was a result of state and local mandates in water use reduction responding to the multi-year drought.

Exhibit 2F
Components of Water Conservation Savings since Fiscal Year 2000



2.3 Water Demand Forecast

2.3.1 Demand Forecast Methodology

LADWP has developed a water demand forecast for each of its major categories of demand. This allows the City to better understand trends in water use and develop effective conservation programs. The methodology used for the demand forecast is called a modified unit use approach. The following steps are used in this approach:

Step 1. Estimate baseline per unit water use – take each billed category of water demand (e.g., single-family, industrial, etc.) for a base (or starting) period and divide by associated demographic driver (e.g., number of single-family homes or number of industrial employees). This baseline per unit water use includes all water conservation up until this point of time.

Step 2. Modify the estimated baseline per unit water use to account for future changes in the following socioeconomic variables: price of water, personal income, family size, economy, drought conservation effect, and passive water conservation (which accounts for efficiencies in water use from state and local plumbing codes and ordinances).

Step 3. Estimate current passive conservation from current plumbing codes and landscape ordinances, and reduce the modified per unit water use factors by estimated percent savings from passive conservation.

Step 4. Multiply modified per unit water use, reduced by passive conservation, for each category in Step 2 and Step 3 by the associated projected demographic drivers in order to obtain projected water demands by billed category. Note that these per unit water use factors do not include future active or additional passive conservation from new or potential codes and ordinances.

Step 5. Estimate non-revenue water (the difference between total water consumption and billed water use) by applying a non-revenue water use factor, and add non-revenue water to the billed category water demands in Step 4 in order to get a forecast of total water consumption with passive conservation from current codes and ordinances.

Step 6. A final water use adjustment is made by reducing each customer classes' (and non-revenue) total water use by a percentage reflective of the assumed mandatory Conservation Phase in effect. Once this is applied we have the total post-conservation water use projection for LA's service area.

2.3.2 Applying the Methodology

In Step 1 of this method, historical water demands for single-family, multifamily, commercial/government, and industrial were averaged from 2010 to 2013 to determine the baseline. This period was used because on average, it represented normal weather conditions, it was post economic recession, and it was before mandatory water restrictions were established by Mayor Garcetti and Governor Brown in response to the current California Drought. For each of these categories, the average water demand was divided by a demographic driver that could be projected into the future. The result of this calculation is a water demand expressed as a unit water use. The estimated demographics for the period 2010 to 2013 were estimated based on 2010 census numbers and projected 2015 values that were provided by the Metropolitan Water District of Southern California, using the Southern California Association of Governments' 2012 Regional Transportation Plan demographic forecast (2012 SCAG RTP).

Exhibit 2G presents the 2012 SCAG RTP demographic projections for LADWP's service area. Exhibit 2H presents the unit use calculation for the baseline.

Exhibit 2G
Projected Demographic Drivers Based on 2012 SCAG RTP

Fiscal Year Ending	Single-Family Homes	Multifamily Homes	Commercial/ Government Employees	Industrial Employees
2015	618,934	775,060	1,687,715	130,124
2020	650,746	828,744	1,704,864	136,023
2025	635,348	900,523	1,749,994	135,994
2030	652,379	940,549	1,788,566	134,061
2035	675,540	973,978	1,807,774	131,686
2040	682,412	1,031,239	1,869,383	131,285

Exhibit 2H
Baseline Unit Water Use (2010-2013)

Demand Category	Average Water Demand (AFY)	Demographic Driver Category	Average Demographic Driver[1]	Average Unit Water Use (gallons/day/ driver)
Single-Family	204,549	Single-Family Homes	607,088	337.2
Multifamily	166,597	Multifamily Homes	750,479	219.0
Commercial/ Government	137,488	Commercial/Gov. Employment	1,616,886	84.7
Industrial	17,849	Industrial Employment	128,143	135.1
Landscaping	204	Multifamily Homes	750,479	0.3

[1] Represents the average between 2010 Census and 2012 SCAG RTP forecast for 2015.

Exhibit 2I
Socioeconomic Variables

	Income Elasticity	Family Size Elasticity
Single-Family	+0.270	+0.550
Multifamily	+0.310	+0.450

Source: MWD 2010 Integrated Water Resources Plan Update Appendix A.1 Demand Forecast

Step 2 in the methodology involves modifying these baseline unit water use to account for changes in the following socioeconomic variables: price of water, personal income, family size, drought conservation effect, and passive water conservation. Using the Conservation Model described in Section 2.2, a price elasticity of demand was estimated to be -0.089 for all sectors. The price elasticity represents a percent change in water use as a result of a percent change in the real price of water. Economic theory suggests that as the real price of water increases, customers are further incentivized to reduce water use. Assuming a 10 percent real increase in the price of water, the estimated price elasticity from the Conservation Model described in Section 2.2 would translate into a 0.84 percent decrease in water use. This low impact suggests that water demand in Los Angeles is inelastic with regard to price of water. This is not surprising given how much passive and active conservation has already occurred in the City since 1990—leaving little extra incentive for customers to reduce water use based on price alone.

In addition to price of water, two other socioeconomic elasticities were used to modify the baseline unit water use: personal income and family size. As the real value of personal income increases, water use tends to increase (all other things being equal), as income is tied to larger lot sizes, bigger homes, greater presence of swimming pools, and more water using fixtures. As family size of a home increases, water use per home increases.

For the socioeconomic variables of personal income and family size, elasticities from MWD's Econometric Water Demand Model, developed as part of MWD's 2010 Integrated Water Resources Plan, were used as shown in Exhibit 2I.

2.3.3 Passive Conservation from Current Codes and Ordinances

In Step 3, the current California and City of Los Angeles plumbing codes and landscape ordinances were used to determine the passive conservation that would occur from 2020 to 2040 assuming 100 percent compliance with codes and ordinances for high-efficiency plumbing fixtures and the new California Model Efficient Water Landscape Ordinance for all new construction. The water savings factors are applied to these new homes, relative to existing non-complying homes in order to derive percent savings from passive conservation over time. Exhibit 2J presents the percent savings from passive conservation projections in LADWP's service area.

As more homes and businesses in Los Angeles become compliant with state and city conservation ordinances, per unit water use will decrease. Codes and ordinances require new construction to comply with water efficient practices which still allow us to maintain a high quality of life while not wasting water. Exhibit 2K shows the projected unit water use with water savings from current codes and ordinances.

Exhibit 2J
Passive Conservation Savings from Current Codes and Ordinances

Years	Percent Conservation Savings			
	Single-Family Plumbing Codes	Multifamily Plumbing Codes	CII Plumbing Codes	Landscape Ordinance
2020	-4%	-3%	-2%	-2%
2025	-3%	-2%	-2%	-2%
2030	-4%	-4%	-3%	-2%
2035	-6%	-5%	-3%	-3%
2040	-7%	-5%	-4%	-3%

Exhibit 2K
Projected Unit Water Use with Savings from Current Codes and Ordinances

Years	Single-Family (gal/SF home)	Multi-Family (gal/MF home)	Commercial/ Government (gal/employee)	Industrial (gal/employee)	Landscaping (gal/MF home)
Baseline	337.2	219.0	84.7	135.1	0.3
2020	324.4	211.0	82.4	131.3	0.3
2025	326.8	211.4	82.2	131.1	0.3
2030	321.1	207.7	80.8	128.9	0.3
2035	317.0	205.0	79.7	127.0	0.3
2040	313.8	202.5	78.7	125.5	0.3

2.3.4 Water Demand Forecast Results

Steps 4 and 5 of the water demand forecast method involve reducing the modified per unit water use factors by the passive conservation savings shown in Exhibit 2J, then multiplying these unit use factors by the projected demographics for LADWP shown in Exhibit 2G, and adding the non-revenue water percentage. Non-revenue water is projected to be 6 percent of total billed water consumption, and includes all unmetered water for fire protection, distribution system flushing, and other unaccounted water. Finally in Step 6, the total water use for each customer class and non-revenue water are reduced by the conservation savings from the assumed Emergency Water Conservation Plan ordinance phase; the result of these steps is the water demand forecast with passive conservation including codes, ordinances, and conservation phases for each of the major categories of demand (see Exhibit 2L). The targeted water demands based on the water use reduction goals established in the Sustainable City pLAn are also listed for reference.

In the Sustainable City pLAn, per capita water use targets are established for potable water demand. Adding LADWP's planned recycled water supply to the pLAn's potable water demand targets yields an overall target for total water demands. This water demand target is compared to the water demand forecast with passive conservation to identify the additional levels of water conservation needed into the future (see Exhibit 2M).

This additional water conservation can come from continued and increased levels of active conservation that LADWP implements, as well as additional passive conservation from long-term behavioral changes in customer water use, and compliance with new codes and ordinances mandating levels of future efficiency standards.

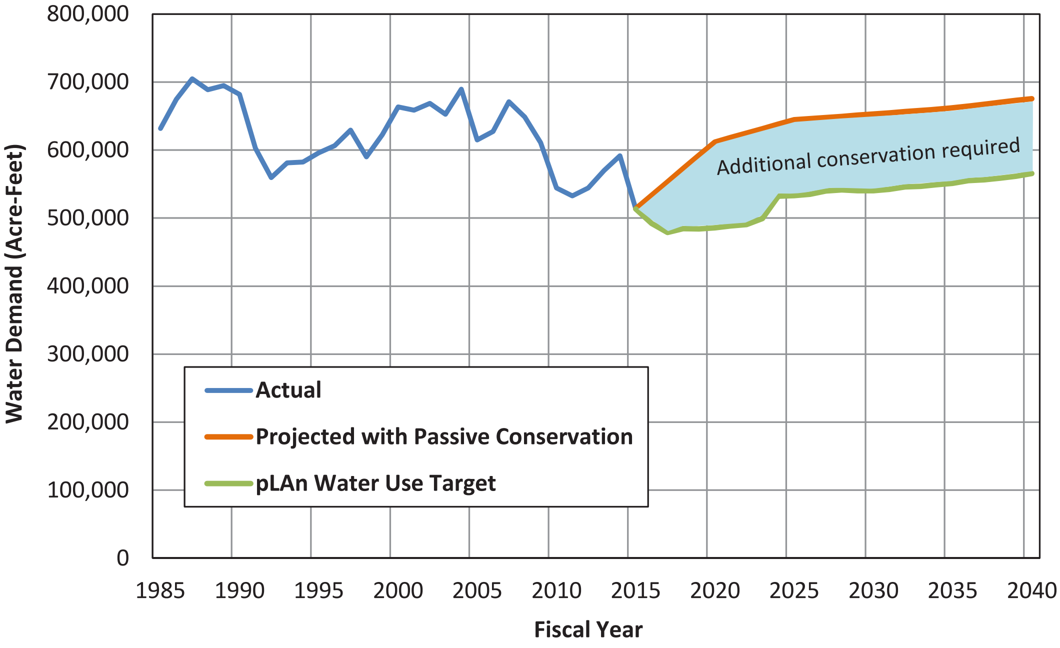
LADWP is completing a comprehensive Water Conservation Potential Study that is evaluating the remaining active and passive conservation that exists citywide. This study also evaluates new conservation measures from technical, customer acceptance and cost-effectiveness perspectives. The results from the study will guide LADWP in its future water conservation planning and program development. Additional commentary on the study can be found in Chapter 3, Conservation.

Exhibit 2L
Water Demand Forecast with Passive Conservation Savings from Codes, Ordinances, and Conservation Phases for LADWP Service Area

Fiscal Year Ending	Water Demands by Sector (Acre-Feet)						
	Single-Family	Multi-Family	Commercial/ Government	Industrial	Non-Revenue	Total	pLAn Target Use[1]
2020	222,958	184,679	148,600	18,869	36,709	611,815	485,600
2025	224,729	206,065	155,994	19,235	38,682	644,706	533,000
2030	226,770	211,454	156,788	18,701	39,173	652,886	540,100
2035	231,776	216,071	156,186	18,104	39,711	661,848	551,100
2040	231,767	225,994	159,554	17,829	40,541	675,685	565,600

[1] Targeted water demands set forth in the Mayor's Sustainable City pLAn

Exhibit 2M
Comparing Water Demand Forecast with Passive Conservation to Water Use Targets in the City's pLAn



2.3.5 Water Demand Forecast with Historical Weather Variability

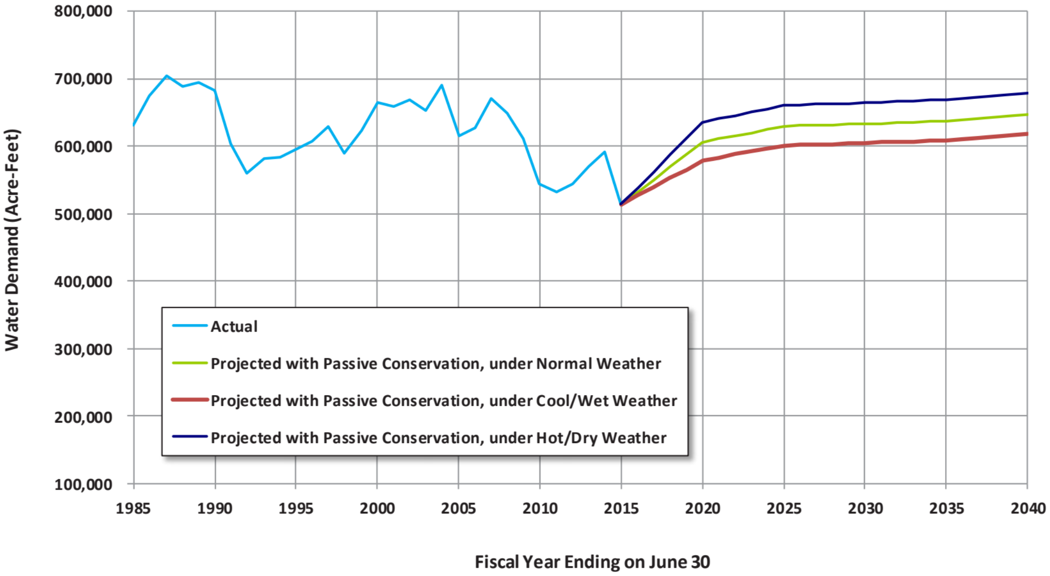
Water demand fluctuates year to year primarily due to variations in weather. The Demand Model estimated the impacts of historical variations in temperature and precipitation on annual water demand. This is accomplished by projecting water demands assuming long-term normal weather, and then comparing normal-weather demand to demands under historical cool/wet weather and historical hot/dry weather. Using this method, projected water demands can vary by approximately ± 5 percent in any given year due to historical weather variability. This means that water demands under cool/wet weather conditions could be as much as 5 percent lower than normal demands; while water demands under hot/dry weather conditions could be as much as 5 percent higher than normal demands. Exhibit 2N presents LADWP's historical and forecasted total water demands with passive water conservation, under the 3 different weather scenarios.

2.3.6 Low-Income Water Demand Projections

The requirements for the 2015 UWMP call for projections of water demands for low-income customers. For rate relief purposes, LADWP maintains records of low-income water customers. For the FY 2014/15, approximately 8.5 percent of the total number of single-family homes in the City are classified as low-income. On average, these customers used about 20 percent less water per household than overall single-family customers. To forecast low-income single-family water demand, the 8.5 percent ratio of low-income to total single-family homes was applied to determine the total number of low-income single family homes. The system wide per unit water use for single-family homes was reduced by 20 percent and multiplied by the total number of low-income single-family homes to determine low-income single-family water demand.

Because the water services of multifamily residential customers are not typically

Exhibit 2N
Projected Water Demand Variability from Historical Weather



metered individually, a multifamily water account can represent upwards of 100 homes. Therefore, a different approach was used to determine low-income multifamily households. LADWP's power system does individually meter multifamily homes and classifies homes as low-income for rate relief purposes. Therefore, the ratio of current low-income multifamily power accounts to total multifamily homes in the City was applied to the total projection of multifamily homes in order to determine the estimated number of future low-income multifamily homes. For the FY 2014/15, approximately 19.6 percent of the total number of multifamily homes in the City is classified as low-income. Assuming that low-income multifamily homes also use 20 percent less water than overall multifamily homes, an adjusted per unit water use for multifamily homes was multiplied by the projected number of low-income multifamily homes to determine low-income multifamily water demand. Exhibit 20 presents the water demand forecast for low-income residential water customers.

Exhibit 20
Water Demand Forecast for Low-Income Residential Customers Fiscal Year Ending June 30

Low-Income Single-Family Customers	**2020**	**2025**	**2030**	**2035**	**2040**
Number of Homes	55,146	53,841	55,284	57,247	57,829
Household Water Use (Gallons/Day)*	245	253	248	245	243
Demand Forecast (Acre-Feet/Year)	15,113	15,233	15,371	15,711	15,710
Low-Income Multifamily Customers	**2020**	**2025**	**2030**	**2035**	**2015**
Number of Homes	162,358	176,420	184,262	190,811	202,029
Household Water Use (Gallons/Day)*	159	163	161	158	157
Demand Forecast (Acre-Feet/Year)	28,940	32,291	33,136	33,859	35,414
Total Low-Income Residential Customers	**2020**	**2025**	**2030**	**2035**	**2015**
Demand Forecast (Acre-Feet/Year)	44,053	47,524	48,507	49,570	51,124

* Assumes same percent conservation as system for single-family and multifamily homes.

Chapter Three

Water Conservation

Rowena Reservoir

3.0 Overview

Multiple factors, such as more frequent and severe droughts, climate change, and environmental regulations, are increasingly restricting LADWP's traditional water supply sources. The City of Los Angeles has long recognized that water conservation should be at the core of multiple strategies to improve overall water supply reliability for its customers. As such, Los Angeles has taken a leadership role in managing its demand for water, resulting in the City's per capita (per person) water use being lower than other large cities in California and the western United States.

Water conservation benefits Los Angeles in numerous ways, such as: (1) improvement in water supply reliability; (2) deferment and reduction in the size of water and wastewater system improvements; (3) monetary savings for customers that reduce their water consumption; (4) reduction in dry weather urban runoff from irrigation of landscaping that decreases the amount of pollutants flowing into local rivers and the Pacific Ocean; and (5) reduction in energy use for water and wastewater treatment, pumping for water conveyance and sewer collection, and within homes and businesses for water heating/cooling and clothes/dish washing. Because water conservation reduces energy needs, it also has the added benefit of reducing greenhouse gas emissions. In the end, the primary beneficiaries of conservation are LADWP's water customers and the natural environment.

The civic cultural ethics of water conservation and water use efficiency in Los Angeles began with the installation of water meters on all services in the early 1900's. At that time, this foundational conservation measure resulted in a 30 percent reduction in water use. When faced with significant supply shortages, City residents have responded with unprecedented reductions in their water use. Los Angeles was one of the first cities in southern California to invoke mandatory water rationing during the 1976-77 drought. The longer drought from 1987 to 1992 was more challenging to southern California and left a permanent imprint on Los Angeles water customers. In response to the water shortages caused by this five-year drought, LADWP expanded its voluntary water conservation program. This program included an extensive public awareness program and education campaign and involved providing incentives for customers to install low-flow showerheads and conserving toilets in their homes and businesses. These hardware changes, coupled with more water efficient use habits, have significantly reduced the amount of imported water that the City needs to buy as its population and commerce continued to grow. Through the years that followed, LADWP expanded its water conservation program to include industrial process water use efficiency, smart irrigation devices, and turf replacement.

The current drought is considered one of the worst in California's history, and has impacted the state like no other. As a result of the water shortages caused by this drought, the following occurred: (1) Metropolitan Water District of Southern California (MWD) implemented its drought allocation of imported water in early 2015; (2) the Governor implemented the first ever statewide mandatory water use restrictions with a state target of 25 percent reduction in water use from 2013 levels; and (3) Mayor Garcetti released his Executive Directive No. 5 (ED5) and the first ever Sustainable City pLAn (pLAn) that included aggressive water conservation and local water management goals for Los Angeles. Also, in response to the current drought, the City expanded its Water Conservation Outreach Program and updated its Emergency Water Conservation Plan Ordinance's enforceable water waste provisions and mandatory outdoor watering restrictions. Comparing FY 2014/15 to FY 2006/07, total water use in the City was 31 percent lower; single family use was 35 percent lower; multi-family use was 24 percent lower; commercial use was 16 percent lower; industrial use was 14 percent lower; and government use was 13 percent lower. As a result of the sustained water conservation ethic of LADWP's water customers, the City's water usage today is about the same as the 1970s despite an increase in population of over 1,000,000 additional people (see Exhibit 3A).

Exhibit 3A
Historical City of Los Angeles Water Use

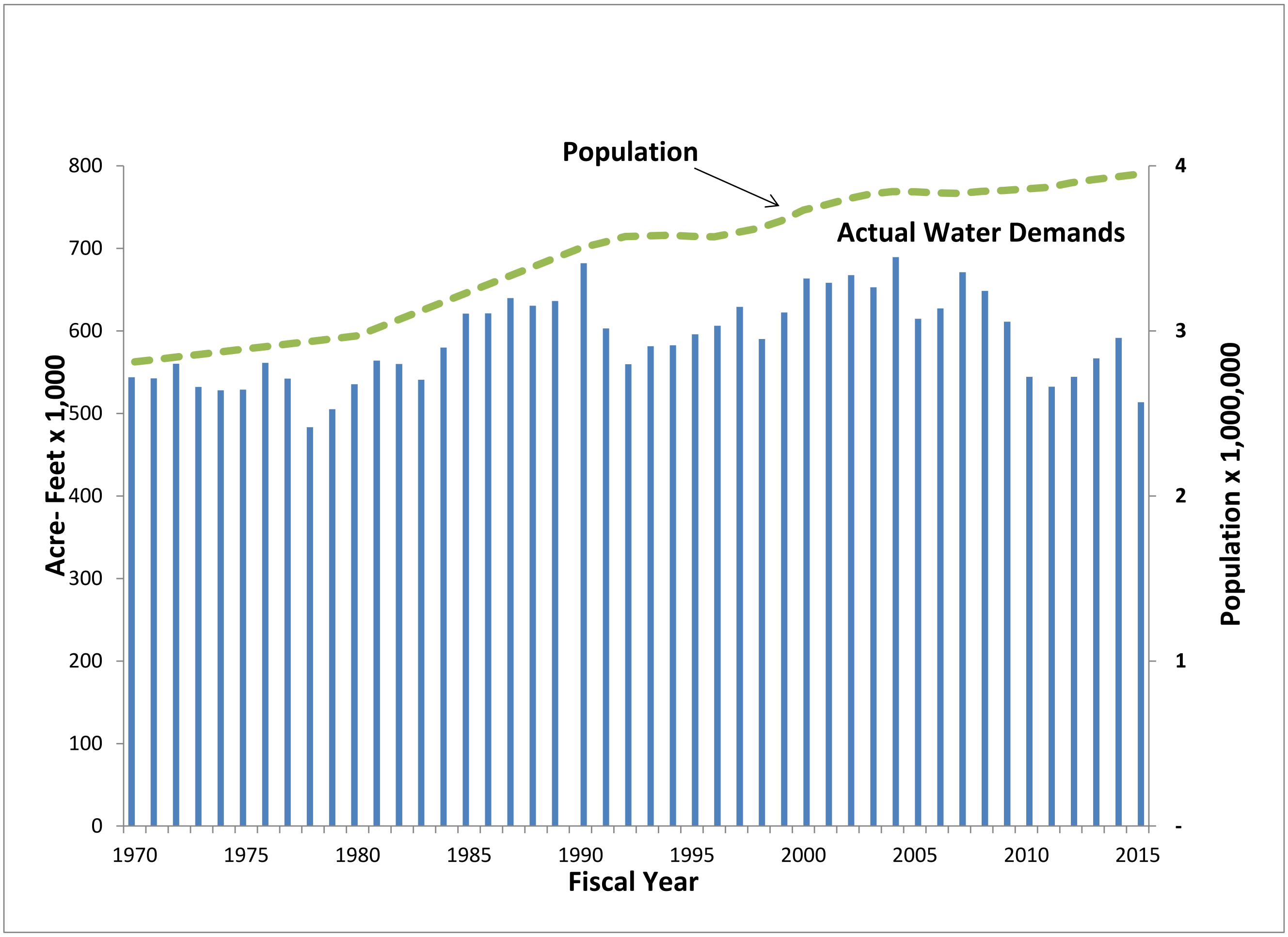


Exhibit 3B shows historical conservation savings from FY 1990/91 through FY 2014/15 based on the installation of conservation devices subsidized through rebates and incentives. Cumulative annual hardware savings since the inception of LADWP's conservation program totals 118,034 AFY. Additional conservation was achieved through changes in customers' behavior to use water more efficiently.

Exhibit 3B
Historical City of Los Angeles Conservation

Fiscal Year	Additional Annual Hardware Installed Savings (AF)	Cumulative Annual Hardware Savings (AF)	Annual Non-Hardware Savings (AF)	Annual Total Savings (AF)
Prior to 1990/1991	31,825	31,825		
1990/1991	4,091	35,916	76,350	112,266
1991/1992	8,670	44,586	105,593	150,179
1992/1993	3,286	47,872	58,546	106,418
1993/1994	4,961	52,832	60,928	113,760
1994/1995	4,041	56,873	62,084	118,957
1995/1996	4,642	61,516	52,648	114,164
1996/1997	2,376	63,892	33,720	97,612
1997/1998	2,637	66,529	30,434	96,963
1998/1999	2,781	69,310	38,305	107,615
1999/2000	3,532	72,842	80,909	153,751
2000/2001	3,078	75,920	79,527	155,447
2001/2002	2,452	78,371	95,428	173,799
2002/2003	2,630	81,002	94,463	175,465
2003/2004	3,257	84,259	84,023	168,282
2004/2005	3,299	87,558	114,428	201,986
2005/2006	2,404	89,963	118,574	208,537
2006/2007	2,095	92,058	116,922	208,980
2007/2008	782	92,840	110,628	203,468
2008/2009	3,127	95,967	149,567	245,534
2009/2010	4,269	100,236	183,080	283,316
2010/2011	2,495	102,731	185,640	288,371
2011/2012	1,993	104,724	183,852	288,576
2012/2013	2,122	106,846	187,444	294,290
2013/2014	3,977	110,823	189,689	300,512
2014/2015	7,211	118,034	272,721	390,755

LADWP will continue to invest in cost-effective water conservation programs and measures. Looking forward, it will expand its focus on landscape water use efficiency and conservation opportunities in the commercial/industrial/institutional (CII) customer sectors. LADWP's conservation planning process includes working with other City departments to ensure that mutual needs are addressed and goals are achieved (e.g., landscape water use efficiency and dry weather runoff reduction).

3.1 Water Conservation Goals

Water conservation reduces demand that typically rises over time with growth in population and commerce. By mitigating those increases in demand, water supply reliability is improved while costs are reduced. In the early 1990s, City residents responded with conservation levels exceeding 20 percent due to mandatory conservation resulting from increasingly drier conditions. As normal water supply conditions returned and LADWP's conservation program continued, conservation levels stabilized at approximately 15 percent. With the recent water shortage and reduced deliveries of imported water from MWD, residential customers have achieved conservation levels exceeding 30 percent in the period between FY 2006/07 and FY 2014/15. From July 2007 through June 2015, 422 billion gallons of water was saved through conservation of all sorts. As a direct result of conservation, imported water purchases from MWD are 23 percent below baseline allocations for FY 2014/15.

3.1.1 ED5 and pLAn Water Conservation Goals

In response to the recent persistent drought, Mayor Garcetti issued the Executive Directive No. 5, Emergency Drought Response—Creating a Water Wise City, in October 2014. Following this action, in April 2015 the Mayor released the City's first ever Sustainable City "pLAn" that focuses on sustainability, with special focus on the environment, the economy, and equity. The pLAn incorporates water savings goals as follows:

- By 2017 reduce per capita potable water use by 20 percent
- By 2025, reduce per capita potable water use by 22.5 percent
- By 2035, reduce per capita potable water use by 25 percent

Achieving these goals will reduce the City's reliance on imported water while providing a drought-proof resource that is not subject to weather conditions. This aggressive approach includes multiple strategies: investments in state-of-the-art technology; a combination of rebates and incentives promoting installation of water-efficient appliances such as weather-based irrigation controllers; efficient clothes washers and urinals; expansion and enforcement of prohibited water uses; reductions in outdoor water use; extending education and outreach efforts; and encouraging regional conservation. LADWP's commitment to conservation is a successful multi-faceted approach that includes tiered water pricing, education and awareness, financial incentives for the installation of a variety of conservation measures, free water saving showerheads and faucet aerators, a Technical Assistance Program (TAP) that provides incentives for business and industry, and large landscape irrigation efficiency programs. Conservation is a foundational component of LADWP's water resource planning efforts and will continue to be central to the City's water use efficiency goals over the long term.

3.1.2 Water Conservation Act of 2009

The Water Conservation Act of 2009, Senate Bill x7-7, requires water agencies to reduce per capita water use by 20 percent by 2020 (20x2020). This includes increasing recycled water use to offset potable water use. Water suppliers are required to set a water use target for 2020 and an interim target for 2015 using one of four methods. The 2020 urban water use target may be updated in a supplier's 2015 UWMP. Failure to meet adopted targets will result in the ineligibility of a water supplier to receive water grants or loans administered by the State unless one of two exceptions is met. Exception one states a water supplier may be eligible if they have submitted a schedule, financing plan, and budget to Department of Water Resources (DWR) for approval to achieve the per capita water use reductions. Exception two states a water supplier may be eligible if an entire water service area qualifies as a disadvantaged community.

Four methodologies are stipulated for calculating the water use target. Three of the methods are listed in Water Code § 10608.20(a)(1). The fourth method was developed by DWR. The four methodologies are:

- Method 1 – Eighty percent of the water supplier's baseline per capita water use.
- Method 2 – Per capita daily water use estimated using the sum of performance standards applied to indoor residential water use, landscape area water use, and commercial, industrial, and institutional water uses.
- Method 3 – Ninety-five percent of the applicable State hydrologic region target as stated in the State's draft 20x2020 Water Conservation Plan.
- Method 4 – Developed through a public process. This method allows flexibility in its calculation to account for the highly diverse conditions of each agency's landscape, commercial, industrial, and institutional water needs and to give credit for past conservation efforts. For more information please go to: http://www.water.ca.gov/urbanwatermanagement/uwmp2015.cfm

In the 2015 UWMP, urban retail water suppliers are required to report interim compliance followed by actual compliance in 2020. The interim target is halfway between the baseline water use and 2020 target. Baseline, target, and compliance-year water use estimates are required to be reported in gallons per capita per day (gpcd). As part of the 2015 UWMP cycle, agencies are given the opportunity to update their 2020 target and change the method used to calculate the water use target.

Actual population growth during the period 2000 through 2010 occurred at a lower rate than projected in the 2010 UWMP as discussed in Chapter 1, Introduction. After the 2000 census and before the 2010 census, there was a large gap between DOF and US Census population estimates. In September 2011, DOF released revised historical population estimates resetting the historical demographics for the period 2000 to 2010 based on results from the 2010 US Census. DWR has recognized there is a significant difference between DOF's projected 2010 population based on 2000 US Census data and the actual 2010 population based on 2010 US Census. As a result, LADWP was required to recalculate its baseline population using 2000 and 2010 US Census data.

For consistent application of the Act, DWR produced Methodologies for Calculating Baseline and Compliance Urban Water Per Capita Use in February 2011. By following requirements provided in this document, LADWP calculated its baseline per capita water use, its urban use target for 2020, and its interim water use target for 2015 during the 2010 UWMP cycle. As part of the 2015 UWMP cycle, LADWP has recalculated its baseline population and targets for 2015 and 2020. LADWP has also shown its compliance with the interim daily per capita target for 2015 as revised herein. Exhibit 3C presents results of the calculations. LADWP's recalculated baseline per capita water use is 154 gpcd using a ten-year average ending on June 30, 2005 and 152 gpcd using a five-year average ending on June 30, 2008. During the 2020 UWMP cycle, reporting compliance with the 2020 daily per capita water use will be required.

During the 2010 UWMP cycle, LADWP selected Method 3 to set its 2015 interim and 2020 water use targets. LADWP investigated all four methods and selected Method 3 because it is the most straightforward and reliable calculation method that adequately accounts for the City's past conservation investments. Method 3 requires setting the 2020 water use target to 95 percent of the applicable State hydrologic region target as provided in the State's Draft 20x2020 Water Conservation Plan. LADWP is within State hydrologic region 4, the South Coast region. LADWP was required to further adjust the calculated 2020 target to achieve a minimum reduction in water use. The gpcd at 95 percent of the hydrologic region was 142 gpcd and using 95 percent of the five-year average base daily per capita water use was equal to 144 gpcd. Therefore, LADWP was required to set its 2020 target at the smaller of the two resultant values. LADWP's interim 2015 target developed in 2010 was 145 gpcd and LADWP's 2020 target was 138 gpcd. In 2015 these targets were recalculated using revised 2010 US Census population data at 148 gpcd for the interim 2015 target and 142 gpcd for 2020. LADWP's actual gpcd in 2015 was 114 gpcd, 34 gpcd less than the revised interim target for Method 3.

Exhibit 3C
20x2020 Base and Target Data Based on Method 3

20x2020 Required Data	Gallons Per Capita Per Day (GPCD)
Base Per Capita Daily Water Use	
10-Year Average[1]	154
5-Year Average[2]	152
2020 Target Using Method 3[3]	
95% of Hydrologic Region Target (149 gpcd)	142
95% Of Base Daily Capita Water Use 5-Year Average (152 gpcd)	144
2020 Target	**142**
2015 Interim Target	148
2015 Actual Use	114

1. Ten-year average based on fiscal year 1995/96 to 2004/05

2. Five-year average based on fiscal year 2003/04 to 2007/08

3. Methodology requires smaller of two results to be actual water use target to satisfy minimum water use target.

As mention in Section 3.1, the Mayor released an aggressive Sustainable City "pLAn" that focuses on long term sustainability. One of the targets is to reduce per capita water use by 20 percent by 2017, 3 years earlier than the Water Conservation Act of 2009, SB x7-7 target of 20 percent water reduction by 2020. LADWP calculated what its target would be from Method 1, which is 80 percent of its 10 year baseline gpcd. Method 1 calculated to 123 gpcd with interim 2015 target at 138 gpcd. Through its accelerated conservation efforts to meet the Mayor's pLAn, LADWP is 24 gpcd less than the interim target for Method 1. As of the end of 2015, LADWP is on track to meet the Mayor's accelerated 20 percent reduction goal and plans to meet future targets of 22.5 percent and 25 percent reduction in gpcd for 2025 and 2035.

3.2 Existing Programs, Practices, and Technology to Achieve Water Conservation

LADWP has developed a number of progressive water conservation programs to address State laws and to meet City goals outlined in ED5 and the pLAn for 2020, 2025 and 2035. LADWP uses multiple programs, practices, and technologies in conjunction with enactment of state and local conservation ordinances and plumbing code modifications to achieve its current water conservation levels throughout its service area and customer classes.

3.2.1 State Laws and City Ordinances

State Laws

In addition to the Water Conservation Act of 2009, multiple legislative bills have been enacted in the past few years requiring water agencies to create measures increasing water conservation, establishing new plumbing standards, and linking grants and loans to the implementation of best management practices (BMPs).

The Water Conservation in Landscaping Act of 2006, Assembly Bill 1881, reduces outdoor water waste through improvements in irrigation efficiency and selection of plants requiring less water. The act required an update to the existing Model Water Efficient Landscape Ordinance and adoption of this ordinance or an equivalent ordinance by local agencies no later than January 1, 2010. If any agency failed to adopt the ordinance or its equivalent, then the Model Water Efficient Landscape Ordinance (MWELO) was automatically mandated by statute. For new construction and redevelopment projects, the ordinance requires development of water budgets for landscaping, reduction of erosion and irrigation related runoff, utilization of recycled water if available, irrigation audits, development of requirements for landscape and irrigation design, and scheduling of irrigation based on localized climate.

On April 1, 2015, Governor Edmund G. Brown Jr issued an executive order to revise the State MWELO. The Ordinance was revised on July 15, 2015 and represents a new statewide standard for irrigation of urban landscapes. In its simplest form, it increases water efficiency standards for new landscaping and retrofits via more efficient landscape irrigation systems, graywater systems, onsite stormwater capture, and it places limits on total turf areas allowed. The threshold size for applicability was reduced from 2,500 square feet to 500 square feet for new residential, commercial, industrial and institutional projects.

For sites under 2,500 square feet, a less prescriptive checklist can be used for compliance rather than the more complex approach required in the Ordinance. The prescriptive checklist limits the maximum turf area to 25 percent of the landscape area for residential areas and prohibits turf in non-residential areas.

The prescriptive checklist also allows the option of utilizing graywater to meet compliance requirements.

For sites greater than 2,500 square feet, and for smaller sites choosing the standard approach required in the ordinance, may have turf areas exceeding 25 percent of the landscape area. However, the sites must comply with a more stringent maximum applied water allowance than what is contained in the 2010 MWELO. The maximum allowed water allowance has been lowered from 70 percent of the reference evapotranspiration to 55 percent for residential projects and 45 percent for non-residential projects. Additionally, high water use plants with a plant water use factor greater than 0.7 are prohibited from use in street medians. According to *"A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California, The Landscape Coefficient Methods and Water Use Classification of Landscape Species"* prepared by the University of California Cooperative Extension and DWR, cool season turf grasses have a plant water use factor of 0.8, effectively prohibiting cool season turf from street medians.

Compliance with the Governor's revised State MWELO or a local ordinance at least as effective was required of water agencies by December 1, 2015. If any agency fails to adopt the ordinance or its equivalent, then the 2015 MWELO is automatically mandated by statute.

In 2009, Assembly Bill 1465, Urban Water Management Planning, was approved to include language in the UWMP Act requiring water suppliers that are members of the California Urban Water Conservation Council (CUWCC) and are complying with the CUWCC's "Memorandum of Understanding Regarding Urban Water Conservation in California (MOU)" to describe their water demand management measures in their respective UWMPs. A more detailed discussion of the CUWCC and BMP compliance is provided in Section 3.2.3.

Assembly Bill 1420 links state funding for water management by urban water suppliers to implementation of water conservation measures. Urban water suppliers are required to be in compliance with the CUWCC MOU to be eligible for water management grants or loans. Senate Bill X7-7 further clarifies that the grant funding conditions required by AB 1420 will be repealed as of July 1, 2016 and replaced with eligibility determined by compliance with 20x2020 targets.

In recent years, there have been numerous regulations approved that increase the water use efficiency requirements of plumbing devices, specifically, Assembly Bill 715 (2007), Senate Bill 407 (2009), and the CALGreen Building Standards. AB 715 requires that all toilet and urinal fixtures sold through retail or installed in existing and new residential and commercial building meet the high efficiency standards by January 1, 2014. SB 407 does not address the sale of plumbing fixtures but adds a requirement that beginning in January 1, 2017 all residential and commercial property sales must disclose all non-efficient plumbing fixtures. CALGreen has an effective date of January 1, 2011 and requires use of water-efficient plumbing fixtures for all new construction and renovations of residential and commercial properties. On April 8, 2015, the California Energy Commission approved new standards for urinals not to use greater than 0.125 gallons per flush, pursuant to the Governor's Emergency Drought Response Executive Order (EO B-29-15). Also included are new standards reducing the flow of bathroom faucets to 1.2 gallons per minute (gpm).

City Ordinances

Since 1988, Los Angeles has utilized ordinances as a tool to reduce water waste, beginning with the adoption of its first version of a plumbing retrofit ordinance. The ordinance mandated installation of conservation devices in all existing residential and commercial properties and installation of water-efficient landscaping in all new construction. Toilets were required to use less than 3.5 gallons per flush (gpf), urinals less than 1.5 gpf, and showerheads less than 2.5 gpm. Customers with three acres or more of turf were required to reduce water consumption by 10 percent from 1986 levels or face a 100 percent surcharge on their water bills.

In 1998 the ordinance was amended, requiring the installation of Ultra Low Flush (ULF) toilets and water-saving showerheads in single family and multi-family residences prior to the close of escrow. This progressive requirement is now being implemented with the help of local real estate professionals. LADWP has explored the expansion of the City's Retrofit on Resale Ordinance to include nonresidential properties.

Los Angeles further increased its water efficiency mandates in 2009 with adoption of the Water Efficiency Requirements Ordinance. This ordinance establishes water efficiency requirements for new developments and renovations of existing buildings by requiring installation of high efficiency plumbing fixtures in all residential and commercial buildings. Exhibit 3D summarizes the minimum requirements for new construction and replacement of fixtures in existing buildings.

Exhibit 3D
Water Efficiency Requirements Ordinance Summary

Device	Requirement
High Efficiency Toilets	1.28 gallons per flush
Urinals	0.125 gallons per flush
Faucets	
Indoor Faucets (Maximum)	2.2 gallons per minute
Private Lavatory Faucets	1.5 gallons per minute
Public Use Lavatory Faucets[1]	0.5 gallons per minute
Pre-rinse Spray Valve	1.6 gallons per minute
Showerheads	2.0 gallons per minute
Dishwashers	
Commercial Dishwashers	varies by type between 0.62 and 1.16 maximum gallons per rack
Domestic Dishwashers	5.8 gallons per cycle
Cooling Towers	5.5 cycles of concentration
Single-Pass Cooling Systems	Prohibited[2]

1. Metering faucets shall not deliver more than 0.25 gallons per cycle.
2. Single pass cooling systems are prohibited unless installed for health and safety purposes that cannot otherwise safely operate.

Mediterranean Style Garden at LADWP Headquarters

In an effort to lead by example, LADWP has been retrofitting all of its own facilities with high efficiency plumbing fixtures prior to the effective date of the ordinance. As of early January 2016, LADWP is 80 percent complete in upgrading its 600 buildings to high efficiency faucets, toilets, urinals, showers, flexible hose connectors, angle valves, as well as correcting leaks and removing existing water damage.

In May 1996, the City's Landscape Ordinance (No. 170,978) became effective with an overarching goal to improve the efficient use of outdoor water. This ordinance was amended in 2009 to comply with the previously discussed Water Conservation in Landscaping Act of 2006 and the State MWELO. On July 15, 2015, the State MWELO was revised to set higher standards for outdoor water use efficiency, and the City is currently implementing the standards set by this update.

LADWP first adopted an Emergency Water Conservation Plan Ordinance in the early 1990's in response to drought conditions. Subsequently, in response to recent water shortage conditions, LADWP has adopted four amendments to expand prohibited uses, increase penalties for violating the ordinance, add an additional phase, modify water conservation requirements, and add a new violation to deter unreasonable use of water. The amendment on June 9, 2015 added an additional phase after Phase II and before the prior Phase III to allow LADWP additional flexibility to address water shortage conditions. The new Phase III fills a gap in the previous ordinance by adding a phase that restricts watering to two days per week. In response to the current drought, Phase II is currently in effect, which restricts watering to three days per week.

On May 3 2016, LADWP's latest amendment to the Ordinance was approved. The amendment strengthens the Ordinance's effectiveness against repeat violators through increased penalties for each additional written violation issued. In addition, the amendment adds a new violation against unreasonable use of water. Prior to this amendment, LADWP lacked the ability to effectively monitor and address high water users who are using unreasonable amounts of water. The amendment gives LADWP the tools and authority to penalize these users who are wasting large amounts of water. For information on the new penalties, refer to Chapter 11, Section 11.4.6.

Six phases of water conservation are incorporated into the Ordinance with prohibitions and water conservation measures steadily increasing by phase. Phase I prohibited use requirements are in effect permanently. Exhibit 3E summarizes the six phases as defined in the latest amendment approved June 9, 2015.

Exhibit 3E
Emergency Water Conservation Plan Ordinance Restrictions by Phase

Phase	Restrictions
I	No use of a water hose to wash paved surfaces except to alleviate immediate safety or sanitation hazards.
	No use of water to clean, fill, or maintain levels in decorative fountains, ponds, lakes or similar structures used for aesthetic purposes unless a recirculating system is used.
	No drinking water shall be served unless expressly requested in restaurants, hotels, cafes, cafeterias, or other public places where food is sold, served, or offered for sale.
	No leaks from any pipes or fixtures on a customer's premises; failure or refusal to fix leak in a timely manner shall subject the customer penalties for a prohibited use of water.
	No washing vehicles with a hose if the hose does not have a self-closing water shut-off device attached or the hose is allowed to run continuously while washing a vehicle.
	No irrigation during rain or within 48 hours after a measureable rain event.
	No irrigation between 9am and 4pm, except for public and private golf courses and professional sports fields to maintain play areas and event schedules. System testing and repair is allowed if signage is displayed.
	All irrigation of landscape with potable water using spray head and bubblers shall be limited to no more than ten minutes per water day per station. All irrigation of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than 15 minutes per cycle and up to 2 cycles per water day per station. Exempt from these restrictions are irrigation systems using very low-flow drip-type irrigation when no emitter produces more than 4 gallons of water per hour and micro-sprinklers using less than 14 gallons per hour.
	No watering or irrigation of any lawn, landscape, or other vegetated area shall occur in a manner that causes or allows excess or continuous water flow or runoff onto an adjoining sidewalk, driveway, street, gutter, or ditch.
	No installation of single-pass cooling systems shall be permitted in buildings requesting new water service.
	No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.
	Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily.
	No large landscape areas shall have irrigation systems without rain sensors that shut off the irrigation systems. Large landscape areas with approved weather-based irrigation controllers registered with LADWP are compliant.
II	All prohibited uses in Phase I shall apply, except as provided.
	No landscape irrigation shall be permitted on any day other than Monday, Wednesday, or Friday for odd-numbered street address and Tuesday, Thursday, or Sunday for even-numbered street addresses. If a street address ends in 1/2 or any fraction it shall conform to the permitted uses for the last whole number in the address. For non-conserving nozzles (spray head sprinklers and bubblers) watering times shall be limited to no more than 8 minutes per watering day per station for a total of 24 minutes per week. For conserving nozzles (standard rotors and multi-stream rotary heads watering times shall be limited to no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 90 minutes per week.
	Irrigation of sports fields may deviate from non-watering days to maintain play areas and accommodate event schedules with written notice from LADWP. However, a customer must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners adopted degree of shortage plus an additional 5% from the customer baseline water usage within 30 days.
	If written notice is received from LADWP, large landscape areas may deviate from the non-watering days if the following requirements are met: 1) approved weather-based irrigation controllers registered with LADWP; 2) Must reduce overall monthly water use by LADWP's Board adopted degree of shortage plus an additional 5% from the customer baseline within 30 days; 3) Must use recycled water if available
	These restrictions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase II, except between the hours of 9am and 4pm.

Phase	Restrictions
III	All prohibited uses in Phases I and II shall apply, except as provided.
	No landscape irrigation shall be permitted on any day other than Monday and Friday for odd-numbered street address and Thursday, or Sunday for even-numbered street addresses. If a street address ends in 1/2 or any fraction it shall conform to the permitted uses for the last whole number in the address. For non-conserving nozzles (spray head sprinklers and bubblers) watering times shall be limited to no more than 8 minutes per watering day per station for a total of 16 minutes per week. For conserving nozzles (standard rotors and multi-stream rotary heads watering times shall be limited to no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 60 minutes per week.
	Recommend use of pool covers.
	Recommend washing of vehicles at commercial car wash facilities.
	Upon written notice from LADWP irrigation of sports fields may deviate from non-watering days to maintain play areas and accommodate event schedules. However, a customer must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners adopted degree of shortage plus an additional 5% from the customer baseline water usage within 30 days.
	If written notice is received from LADWP, large landscape areas may deviate from the non-watering days if the following requirements are met: 1) approved weather-based irrigation controllers registered with LADWP; 2) Must reduce overall monthly water use by LADWP's Board adopted degree of shortage plus an additional 5% from the customer baseline within 30 days; 3) Must use recycled water if available
	These restrictions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase III, except between the hours of 9am and 4pm.
IV	All prohibited uses in Phases I, II, and III shall apply, except as provided.
	No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street address and Tuesday for even-numbered street addresses. If a street address ends in 1/2 or any fraction it shall conform to the permitted use for the last whole number in the address. For non-conserving nozzles (spray head sprinklers and bubblers) watering times shall be limited to no more than 8 minutes per watering day per station for a total of 8 minutes per week. For conserving nozzles (standard rotors and multi-stream rotary heads watering times shall be limited to no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 30 minutes per week.
	Use of swimming pool covers on all residential swimming pools when not in use.
	No washing of vehicles allowed except at commercial car washes.
	No filling of decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes, with potable water.
	Irrigation of sports fields may deviate from the specific non-watering days with written notice from LADWP. However, a customer reduce overall monthly water use by LADWP's Board of Water and Power Commissioners adopted degree of shortage plus an additional 10% from the customer baseline water usage within 30 days.
	If written notice is received from LADWP, large landscape areas may deviate from the specific non-watering days if the following requirements are met: 1) approved weather-based irrigation controllers registered with LADWP; 2) Must reduce overall monthly water use by LADWP's Board adopted degree of shortage plus an additional 10% from the customer baseline within 30 days; 3) Must use recycled water if available
	These restrictions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase IV, except between the hours of 9am and 4pm.
V	All prohibited uses in Phases I, II, III, and IV shall apply, except as provided.
	No landscape irrigation is allowed.
	No filling of residential swimming pools and spas with potable water.
	If written notice is received from LADWP, golf courses and professional sports fields may apply water to sensitive areas, such as greens and tees, during non-daylight hours and only to the extent necessary to maintain minimum levels of biological viability.
VI	All prohibited uses in Phases I, II, III, IV, and V shall apply, except as provided.
	The LADWP Board of Water and Power Commissioners is authorized to implement additional water prohibitions based on the water supply situation.

Specific procedures for determining the initiation and termination of a phase are provided in the Emergency Water Conservation Plan Ordinance. Phases are initiated through recommendations provided by LADWP to the Mayor and City Council (Council).

3.2.2 Conservation Pricing

Since 1993, Los Angeles has used an ascending tier rate structure that is completely volumetric pricing. Los Angeles' water rates have been recently restructured to incorporate and further reinforce foundational water use efficiency and financial principles. The rates, approved by the City Council on March 15, 2016, were first proposed to the Board of Water and Power Commissioners in July 2015 followed by 5 months of extensive community outreach at over 90 Neighborhood Council, community, business and civic meetings and webinars.

LADWP's rate design is influenced by a variety of factors, especially the importance of additional conservation in light of the unprecedented drought facing California and the need to comply with several legal requirements. These considerations headline the following objectives LADWP has established to guide its rate design. Primary objectives of the rate restructuring include:

- Minimizing individual bill impacts for low usage customers;
- Continuing to promote water conservation as envisioned by the Mayor's goal for a 20% per capita reduction in consumption by 2017;
- Complying with all guiding legal principles;
- Recovering costs identified in the new water cost of service study;
- Aligning water supply costs to sources of supply;
- Retaining water-budget rate structure and marginal-cost based conservation principles;
- Achieving full recovery of costs (without over-billing) in a cost causative manner;
- Implementing symmetrical decoupling mechanism for base rate revenue;
- Helping facilitate economic development;
- Simplifying where possible;
- Making bills easier to understand; and
- Considering implications for customer care and billing system (CC&B).

Particular unique features of the rate restructuring include:

- Budget based allocations based on 5 lot size groups and 3 temperature zones – This structure was first introduced in the early 1990's rate process through a Blue Ribbon Commission appointed to promote conservation and rate equity.
- Seasonal rates – Allocations are adjusted seasonally to reinforce the opportunity to conserve in winter months beyond summer outdoor usage.
- Four tiered rate for single dwelling-unit residential – The four tiers build on the previous 2 tier structure, providing a first tier indoor base allocation, a second tier based on California Friendly Landscaping efficient outdoor allocation, a third tier capturing high outdoor water use, and a fourth tier of excessive use. In keeping with cost of service principles, the incremental pricing for the tiers is based on the cost of water supply and, for the third and fourth tiers, added pumping and storage costs.

- 100% Volumetric Pricing – Rates do not include a flat-rate charge. This is perhaps the single greatest pricing signal the rates structure provides. Minimizing water use directly minimizes billing.

- Decoupling – LADWP included a method to allow recovery of revenue if sales decrease due to increased conservation and to eliminate over collection of revenue if water sales increase. By eliminating the linkage between volume of sales and revenue collection (decoupling) the rate structure provides financial stability and removes inherent barriers to conservation.

- Revenue predictability – The five year rate increase provides LADWP the opportunity to plan ahead with a greater level of certainty for project funding..

3.2.3 CUWCC Best Management Practices

The CUWCC is the voice of urban water conservation in California, and LADWP has been an active member since its inception in 1991. Instrumental in the development of the CUWCC MOU, LADWP was also one of the original signatories to this MOU. The MOU identifies BMPs as proven conservation measures as determined by the CUWCC. The most recent amendment to the MOU, adopted on September 17, 2014, updated compliance alternatives with the adopted BMPs. A water agency can now comply with the MOU through one of three methodologies: BMP compliance, accomplishing water conservation through a set of measures equal or greater than the water savings provided by the BMPs (Flex Track Menu), or accomplishing water conservation goals as measured in gpcd. All Group One (urban water suppliers) signatories to the MOU are committed to implementing the BMPs.

Over the last 25 years, LADWP has played a significant role in the governance and policy making at the CUWCC, holding a seat on the Board of Directors, Strategic Planning Committee, By-Laws Committee, Research and Evaluation Committee, CII Committee, co-chair of the Membership Committee, and chair of the Group One Representation Selection Committee. To date, LADWP has been actively involved in all of the revisions that the MOU has undergone.

One of the obligations as a signatory to the MOU is to submit a Best Management Practices Retail Water Agency Report to the CUWCC. Previously submitted annually, this report is now submitted biennially, to detail progress in implementing the foundational and programmatic BMPs currently specified in the MOU. LADWP actively implements the BMPs, and the CUWCC BMP reports are available for public review by accessing CUWCC's website at www.cuwcc.org.

In the early 1990s, the State Water Resources Control Board identified urban water conservation as a major means for resolving problems in the Bay-Delta. Large water agencies, including LADWP, actively participated in work groups to develop conservation strategies. The result of this effort is in the aforementioned MOU.

The MOU commits signatory water suppliers to develop comprehensive conservation programs using sound economic criteria and to consider water conservation on an equal footing with other water management options. The MOU established the CUWCC to monitor implementation of the BMPs and to maintain the list of BMPs.

A BMP is defined as:

(a) An established and generally accepted practice among water suppliers resulting in more efficient use or conservation of water.

(b) A practice for which sufficient data are available from existing water conservation projects to indicate that significant conservation or conservation-related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water suppliers to carry out.

LADWP implements all of the BMP requirements in the MOU that are applicable to retail water agencies like LADWP. Foundational BMPs are considered as essential BMPs for any water utility and are ongoing practices not subject to time limitations. Programmatic BMPs are minimal activities required to be completed by each utility within the timeframe of the implementation schedules provide in the MOU. A listing of the BMPs is shown in Exhibit 3F.

CA Friendly Landscaping at Distribution Station 28

Exhibit 3F
CUWCC BMPs and Implementation Status

Category	Sub-category	Practices	Status
Foundational			
Utility Operations	Operations Practices	Maintain the position of a trained conservation coordinator	Implemented
		Prevent water waste – enact, enforce or support legislation, regulations, and ordinances	Implemented
		Wholesale agency assistance programs	Not applicable
	Water Loss Control	Conduct Standard Water Audit and Water Balance	Implemented
		Measure performance using AWWA software	Implemented
		Calculate economic value of real loss recovery based upon agency's avoided cost of water	Implemented
		Analyze apparent and real losses and their causes by quantity and type	Implemented
		Reduce real losses to the extent cost-effective	Implemented
		Advise customers whenever it appears possible that leaks exist on customer's side of meter	Implemented
	Metering with Commodity Rates	100% of existing unmetered accounts to be metered and billed by volume of use	Implemented
	Conservation Pricing	Maintain a water conserving retail rate structure	Implemented
Education	Public Information Programs	Maintain active public information program to promote and educate customers about water conservation	Implemented
	School Education Programs	Maintain active program to educate students about water conservation and efficient water use	Implemented
Programmatic			
Residential		Residential Assistance – provide leak detection assistance	Implemented
		Landscape water survey programs for single family and multi-family residential accounts	Implemented
		High efficiency clothes washer incentive program	Implemented
		Watersense Specification (WSS) for new residential development	Implemented
		WaterSense Specification (WSS) for toilets	Implemented
Commercial/ Industrial/ Institutional (CII)		Implement unique conservation programs to meet annual water savings goals for CII customers	Implemented
		Implement measures on the CII list with well-documented savings	Implemented
Landscape		Identify accounts with dedicated irrigation meters and assign ETo based water use budgets equal to no more than an average of 70% of ETo, provides notices with bills showing water use budgets and relationship between budget and actual consumptions, offer site specific technical assistance to reduce water to those accounts over 20% of budget	Implemented
		Offer technical assistance and surveys upon request	Implemented
		Develop and Implement a strategy targeting and marketing large landscape water use surveys to CII accounts with mixed meters.	Implemented

Southwest Style Garden at LADWP Headquarters

3.2.4 Existing Conservation Program

LADWP develops cost effective programs to achieve multiple goals of demand reduction, customer service, environmental responsibility, and compliance with CUWCC BMPs. Conservation potential is considered in determining program approach and duration. Some types of conservation programs result in savings that are more easily measured than others. LADWP's programs include traditional demand-side management measures, as well as infrastructure improvement programs that contribute to water waste reductions. Demand-side management programs, like the rebate programs for water-saving toilets and high-efficiency washing machines, produce results that are measurable. Public information, education, and other general conservation awareness programs are intended to alter customers' behavioral patterns on water use and thus, are more difficult to quantify. It is such behavioral change in water use that the City can point to as the primary reason for significant reduction in water consumption during water shortage periods. Combined with LADWP's conservation pricing structure discussed in Section 3.2.2, these programs increase system reliability and efficiency and will provide a secondary benefit of reducing runoff.

LADWP dedicates staff in support of the Water Conservation Programs. Key personnel include the full-time water conservation coordinator who serves as LADWP's CUWCC representative, oversees conservation policies, and coordinates with other LADWP staff on the implementation of all the LADWP programs to ensure fulfillment with the annual water saving goals and CUWCC BMPs. Additional staff include the water conservation group that implement the various residential and commercial programs, and the Water Conservation Response Unit that educate customers about prohibited water uses, investigate claims of water waste, and issue citations for water waste when warranted.

Specific conservation programs (past and present) associated with the CUWCC BMP categories are listed and discussed in Exhibit 3G. Appendix H contains the latest biennial reports provided to the CUWCC showing that LADWP has met all the BMP requirements.

Exhibit 3G
Current and Past Conservation Programs

CUWCC BMP Category	Conservation Measures	pre 1985	Year in Service
Awareness/Support			
	Pricing		
Utility Operations – Water Waste Prohibition	Retrofit on Resale Ordinance		1998
Utility Operations - Pricing and Operations	Tiered Rate Structure		1993
Utility Operations – Water Waste Prohibition	Drought Buster Program		1990
Utility Operations – Water Waste Prohibition	Emergency Water Conservation Plan Ordinance		1990
Utility Operations –Conservation Coordinator	Full-time dedicated staff to conservation	x	
Utility Operations - Metering	Full Metering and Volumetric Pricing	x	
Utility Operations - Pricing	Sewer Charge using Volumetric Pricing	x	
Education - Public Information Programs	**Public Information**		
	Save The Drop Outreach Campaign		2015
	Community Partnership Grants		2014
	Drought Response Outreach		2008
	Hotel & Restaurant Water Conservation Campaign		2008
	ULFT Customer Satisfaction Survey		1992
	Advertising	x	
	Bill Inserts	x	
	Brochures	x	
	Community Involvement Program	x	
	Exhibits	x	
	Hotline	x	
	Speakers Bureau	x	
	School Education		
	LAUSD MOU		2008
	High School in concert with the Environment - Student Home Water/Energy Survey		1994
	Lower Elementary	x	
	Upper Elementary	x	
	Junior High	x	
Residential			
Residential	Rain Barrel and Cistern Rebate		2013
Residential	Direct Install Partnership Program – Home Energy Improvement Program (HEIP)		2013
Residential	Residential Drought Resistant Landscape Incentive Program		2009
Residential	High Efficiency Clothes Washer Incentive Program		1998

Residential	Better Idea/Neighborhood Bill Reduction Service Program --Showerhead installation		1993
Residential	Community-Based Organization Toilet Distribution Centers, Direct Install		1992
Residential	High Efficiency Toilet Rebate		1990
Residential	Home Water Surveys		1990
Residential	Retrofit Kits Distribution		1988
Commercial/Industrial/Government			
Commercial/Industrial/Institutional	Commercial/Industrial Drought Resistant Landscape Incentive Program		2009
Commercial/Industrial/Institutional	Water Efficiency Requirements Ordinance		2009
Commercial/Industrial/Institutional	General Services Dept. MOU to Retrofit Plumbing		2009
Commercial/Industrial/Institutional	Public Agency Plumbing Audit and Training Program		2009
Education - Public Information Programs	Targeted Literature Mailing		1993
Commercial/Industrial/Institutional	Commercial/Industrial Conservation Guidebook		1992
Commercial/Industrial/Institutional	Cooling Tower Manual and Workshops		1992
Commercial/Industrial/Institutional	Commercial Rebate Program		1991
Commercial/Industrial/Institutional	Interior Water Use Audits		1991
Commercial/Industrial/Institutional	Technical Assistance Program (TAP)		1991
Landscape; Commercial/Industrial/ Institutional	Typical Audits		1991
Landscape			
Landscape	California Friendly Landscaping Website		2014
Landscape	Recreation and Parks MOU		2007
Landscape	Large Turf Irrigation Controller Pilot Program		2000
Landscape	Protector del Agua -- English and Spanish Language Workshops		1995
Landscape	Improving Irrigation Performance Manual & Workshop		1993
Landscape	Large Turf Audits and Audit Training		1993
Education - Public Information Programs	Lawn Water Guide Direct Mailing (as requested)		1989
Education - Public Information Programs	Demonstration Gardens		1988
Landscape	Ten Percent Large Turf Water Reduction Program		1988
System Maintenance Measures			
Utility Operations - Water Loss Control	Water Loss Task Force & Action Plan		2015
Utility Operations - Water Loss Control	Water Loss Audit and Component Analysis Study		2013
Utility Operations - Water Loss Control	Large Meter Replacement Program		2001
Utility Operations - Water Loss Control	Fire Hydrant Shutoffs		1991
Utility Operations - Water Loss Control	Meter Replacement Program		1988
Utility Operations - Water Loss Control	Cement Mortar Lining of Pipelines	x	
Utility Operations - Water Loss Control	Corrosion/Cathodic Protection	x	
Utility Operations - Water Loss Control	Infrastructure Program	x	

Awareness/Support Measure Programs

Awareness/support measures can be classified as active or passive. Active components include full metering of water use, assessment of volumetric sewer charges, and a conservation rate structure. Passive components typically include providing educational materials for schools, community and customer presentations, maintaining a conservation hotline, and a wide range of information distributed through customer bills, advertising in public venues, LADWP's website, and direct mail. Passive awareness/support measures provide the foundation for the conservation movement by raising water use awareness, water conservation program visibility, and encouraging community involvement.

Over the last several years, LADWP has greatly expanded its Water Conservation Outreach Program. The program calls on customers to increase their conservation efforts and is designed to instill the understanding that water conservation is the cultural norm in Los Angeles. These goals are achieved through the joint implementation of innovative marketing strategies and community outreach activities.

The program includes the following strategies:

- Earned Media Opportunities: Through the distribution of regular and timely news releases, the LADWP Communications Team generates broadcast interviews and print articles in various media outlets about water conservation and available programs.

- Social Media: Program facts, web links, reminders, videos, photos, and other water conservation relevant information shared regularly via Twitter, Facebook, and YouTube.

- Print Materials: Branded print materials including flyers, Frequently Asked Questions, and fact sheets available for distribution at all relevant venues, such as community fairs.

- Media Advertising Campaign: Campaign messages using paid advertising in the following: television, radio, newspapers, magazines, bus tails, movie screens, and online ads.

Marketing strategies are complemented by year-round community outreach activities including LADWP-hosted water conservation and landscaping workshops, garden shows, neighborhood council meetings, and community events. These public information opportunities are further enhanced by sponsorships and strategic partnerships with elected officials, other water agencies, non-profit organizations, and businesses like home improvement stores that host other related activities that can help LADWP reach customers effectively with our key messages.

Special emphasis has been placed on providing water conservation education in Los Angeles Unified School District schools. LADWP has several longstanding outreach partnerships that provide direct and indirect outreach to students from elementary school through high school.

- Los Angeles Times in Education: Provided newspapers to students in grades 4-12 and lesson packages for teachers on supply sources and conservation. Students are encouraged to illustrate concepts they have learned by participating in an annual art contest.

- "Thirsty City" Live Performances: Play presented on-campus that introduces students to water supply sources, water supply challenges, and conservation.

LADWP's Water Conservation Media Advertising Campaign is continually updated to keep customers engaged and to avoid message fatigue. In 2013, LADWP focused its Media Advertising Campaign on its California Friendly Incentive Program. As a result of the messaging, the program saw a 10-fold increase in applications. LADWP's 2014 campaign focused on educating residents on the importance of conserving during the drought. Media messaging concentrated on LADWP's three day per week outdoor watering restrictions, voluntary conservation measures residents could take, and LADWP's water conservation rebates.

On April 9, 2015, the new "Save the Drop" Water Conservation Outreach Campaign was launched. The campaign is a partnership between the Mayor's Office and LADWP. Outreach materials include public service announcements, radio spots, event handouts, and signage on the sides of Bureau of Sanitation trucks. The campaign also partnered with celebrities such as Steve Carrell, Jaime Camil, and Moby for public service announcements airing on TV, cinema and radio.

Residential Programs

Residential conservation programs were first developed and launched by LADWP during the drought of 1987 through 1992. In 1990, the ULF Toilet Rebate Program was initiated, followed two years later by the ULF Toilet Distribution Program. In 2003, a well-received free installation service component was added to the ULF Toilet Distribution Program that included free water-saving showerheads, faucet aerators and replacement toilet flapper valves. Today distribution of free faucet aerators and showerheads continues for all single family, multi-family, and commercial customers.

In 2008, MWD initiated the region-wide SoCal Water$mart Program for residential water conservation. This program replaced previous LADWP rebate programs, and rebate programs offered by individual water service providers throughout the MWD service area. This MWD sponsored program sets uniform rebate requirements across the MWD service area, and provides a clearinghouse for processing rebates for all MWD member agency customers. Local agencies have the option of supplementing baseline rebate amounts to their customers through the program. LADWP has increased baseline rebates for several of the qualifying products. Eligible customers include residential customers residing in single family and multi-family homes, even if multi-family residents do not receive a water bill. Exhibit 3H summarizes the residential conservation savings programs from FY 2010/11 through FY 2014/15. During this period, an estimated annual savings of 5,781 AFY was achieved, inclusive of LADWP in-house programs. This is in addition to previous cumulative conservation savings. Rebate amounts provided in Exhibit 3H are the total device rebates, which includes the base MWD rebates plus supplemental rebate amounts provided by LADWP.

Residential Turf Removal and Replacement with CA Friendly Landscape

Exhibit 3H
Residential Conservation Programs and New Savings for FY 2010/11 through 2014/15

Device Type/Program	Rebate Amount	Devices Installed	Estimated Annual Savings (AFY)
	Retrofit		
SoCal Water$mart Program			
High Efficiency Toilets (1.28 gpf or less)[1]	$100	64,234	1,740.3
High Efficiency Washing Machine Water Factor < 5.0[2]		9,668	301.6
High Efficiency Washing Machine Water Factor < 4.0[3]	$300	29,899	1,031.5
Sprinklerhead Rotating Nozzles (30 minimum)	$6 each	21,456	94.4
Weather Based Irrigation Controller	$200 per controller for landscape area < 1 acre and $35 per station for landscape areas > 1 acre	918	42.8
Turf Replacement	$1.75 per square foot	12,643,808	1,707.2
Soil Moisture Sensors	$200 per controller for landscape area < 1 acre and $35 per station for landscape areas > 1 acre	2	0.1
Rain Barrels (Maximum of 4, minimum size of 50 gallons each)	$100 per barrel	1,852	3.5
Subtotal SoCal Water$mart Programs	**-**		**4,921.4**
LADWP In-house Programs			
High Efficiency Showerheads	-	33,093	545.0
Residential Faucet Aerators	-	56,897	159.0
Home Energy Improvement Program - Showerheads	-	4,283	71.0
Home Energy Improvement Program - Faucet Aerators	-	5,520	15.0
Home Energy Improvement Program - High Efficiency Toilets of 1.28 gpf or less replacing 1.6 gpf or greater	-	1,824	66.9
Drip Irrigation Starter Kits[4]		431	3.0
Subtotal LADWP In-house	**-**		**859.9**
Total Single Family Residential	**-**		**5,781.3**

1. As of November 1, 2015, program revised to provide rebates for installation of premium high efficiency toilets using 1.06 gallons or less per flush. New toilet must replace a toilet using 1.6 gallons or greater per flush.
2. As of April 1, 2011 rebates for washing machines with a water use factor of less than 5.0 were discontinued and replaced by a water use factor of less than 4.0.
3. As of July 1, 2015 rebates are only available for washing machines with a water use factor of less than 1.0.
4. Program has been discontinued.

In November 2015, the SoCal Water$mart Program replaced its rebate for high efficiency toilets (HET), with requirements for installation of premium HETs. Premium HETs use 1.06 gallons or less per flush. To be eligible for a rebate a premium HET must replace a toilet using 1.6 gallons per flush or more. LADWP supplements the rebates for its single-family customers, offering a total of $100 per toilet. The HET rebate program has been highly successful with 64,234 units installed between FY 2010/11 and 2014/15, equating to over 1,740 AFY in water savings.

Prior to initiation of the SoCal Water$mart Program, LADWP was assisted by community-based organizations (CBOs) to reach the milestone of more than 1.27 million toilets installed through December 31, 2006. CBOs were integral to LADWP's success, reaching into the communities they serve to convey the conservation message and directly undertake conservation activities. Benefits of this approach accrued to community participants through reduced water bills, to CBOs through employment opportunities and revenues earned, and to the City through significant water savings achieved. Prior to its discontinuation, the program was funded at more than $7 million annually. The toilets replaced through the program continue to produce estimated water savings of more than 44,000 AFY today.

LADWP initiated a High Efficiency Washer Rebate Program in 1998 promoting the purchase and installation of high efficiency washing machines saving both water and energy. In February of 2009, the High Efficiency Washer Rebate Program transferred from LADWP to the SoCal Water$mart Program with co-funding provided by MWD. 39,567 rebates were paid, between FY 2010/11 and 2014/15, for machines purchased and installed throughout the City, saving a total of 1,333 AFY annually. In the past rebates were $300 per washing machine with a water factor (a measure of efficiency) of 5.0 or less changing to 4.0 or less as of April 1, 2011. As of July 1, 2015 rebates are only issued for washing machines with a Consortium of Energy Efficiency standard of 1.0 or less.

A sprinklerhead rotating nozzle retrofit rebate of $6 per nozzle is available through the SoCal Water$mart Program for a minimum of 30 nozzles. Replacing standard sprinkler heads with rotating nozzles can use up to 20 percent less water. Rotating nozzles are able to distribute water uniformly across a landscape, in a more water-efficient manner than standard sprinklers. Spray from rotating nozzles is less likely to result in misting and misdirection from winds, resulting in less runoff onto impervious surfaces thus reducing dry-weather runoff. Between FY 2010/11 and 2014/15, over 21,456 rotating nozzle rebates were issued to LADWP customers saving approximately 94.4 AFY.

Rebates for installation of weather-based irrigation controllers are also available through the SoCal Water$mart Program. Rebate amounts are $200 per controller for landscape areas of less than one acre and $35 per station for landscape areas greater than one acre. Weather-based irrigation controllers provide customized irrigation schedules based on local site conditions and in response to weather changes. These smart controllers receive weather updates to automatically adjust the schedule and amount of water applied. Between FY 2010/11 and FY 2014/15, 918 LADWP customers received rebates for installation of the controllers for landscape areas of less than one acre, saving approximately 42.8 AFY.

LADWP, through the SoCal Water$mart program, is offering turf removal rebates of $1.75 per square foot up to 1,500 square feet per residence for LADWP customers. Not all MWD member agencies are currently offering a turf removal program to their customers as MWD funds for the program were exhausted in mid-2015. LADWP's current program was re-launched on July 15, 2015 and is entirely funded by LADWP. Over 12.6 million square feet of turf rebates were issued between FY 2010/11 and FY 2014/15, which equates to savings of approximately 1,700 AFY.

Through participation in the SoCal Water$mart Program, LADWP customers are also eligible for soil moisture sensor system rebates. Rebates are available at $200 per unit for landscape areas less than 1 acre and for landscape areas greater than 1 acre rebates are available at $35 per station.

Rain barrel rebates are available for a maximum of four rain barrels up to $100 per rain barrel with a minimum size of 50 gallons. Between October 2013, when the program was initiated, and FY 2014/15, rebates were issued for 1,852 rain barrels with a savings of approximately 3.4 AFY. In November 2015, cistern rebates became available for $400 per cistern with a minimum size of 200 gallons.

Upon request, water-saving showerheads and faucet aerators remain available to LADWP customers, free of charge. Approximately 33,090 high efficiency showerheads and 56,900 faucet aerators were distributed between FY 2010/11 and FY 2014/15 saving approximately 704 AFY. During past water shortages, more than 1.5 million water conservation retrofit kits were distributed throughout Los Angeles; the kits included one-gallon toilet displacement bags, low-flow showerheads, and toilet leak detection tablets.

Additional water saving opportunities are available to residential customers through participation in LADWP's Home Energy Improvement Program (HEIP). LADWP offers customers free assessments of their homes to identify areas where the most cost-effective upgrades and repairs should be made to improve water and energy efficiency of the home. Through this program between FY 2013/14 and 2014/15 approximately 4,283 showerheads, 5,520 faucet aerators, and 1,824 premium and regular HETs were installed saving approximately 153 AFY.

Commercial/Industrial/Institutional (CII) Program

This category represents some of the largest volume water users in LADWP's customer base, and represents a great deal of conservation potential. LADWP, in partnership with MWD, has developed and implemented a commercial rebate program entitled the Save Water Save a Buck Program, designed specifically for customers in the CII sector and multi-family residences with five or more units, and represented by a homeowners association. In the CII sector, the program provides rebates for water saving plumbing fixtures, food service equipment, and landscaping equipment. Within the multi-family sector the program provides rebates for high efficiency washers, high efficiency toilets, and landscape equipment. In addition, packaged water use efficiency solutions are being developed for specific business sectors. Efforts are also underway to better promote the financial incentives available that make water conservation retrofits more cost effective for business and industry. LADWP takes full advantage of regional programs offered through MWD for the CII sector and for many product rebates, and provides supplemental funding to boost the base rebate provided by MWD.

The Save Water Save a Buck Program was launched in 2001 to provide menu-based rebates for water conserving measures applicable to many types of CII facilities. Categories of products eligible for rebates, rebate amounts, number of rebates for the LADWP service area, and estimated savings for the period FY 2010/11 through FY 2014/15 are provided in Exhibit 3I. During this period, an estimated annual savings of 12,015 AFY was achieved, inclusive of LADWP in-house programs, Technical Assistance Program (TAP), LADWP facility retrofits, Recreation and Parks Department facility retrofits, Small Business Direct Install (SBDI) program, and Multi-Family Direct Thermal Savings (MFDT) program. This is in addition to previous cumulative conservation savings. Rebate amounts provided in Exhibit 3I include the base MWD rebate plus supplemental rebate provided by LADWP.

Exhibit 3I
CII Current Conservation Programs and New Savings for FY 2010/11 through 2014/15

Device Type/Program	Rebate Amount	Devices Installed	Estimated Annual Savings (AFY)
	Retrofit		
Save Water Save a Buck Program			
High Efficiency Toilets (1.28 gpf or less)	$150 each ($50 new construction)	281,231	6,919.4
Premium High Efficiency Toilets (1.06 gpf or less replacing ≥ 1.6 gpf)	$200	12,117	445.3
Zero and Ultra Low Water Urinals (upgrade from ≥ 1.5 gpf)	$500 each	4,379	535.4
Cooling Tower pH Controller	$3000 each	82	159.4
Cooling Tower Conductivity Controller	$625 each	30	19.3
Air Cooled Ice Machine	$1,000 each	0	0
Connectionless Food Steamer	$600 compartment	0	0
Dry Vacuum Pump (maximum 2.0 horsepower)	$125 per 0.5 horsepower	4	0.4
Weather Based Irrigation Controller	$50 per station or central computer	14,334	189.3
Soil Moisture Sensor System	$35 per station	24	0.3
Large Rotary Nozzle (8 head minimum)	$13 per head	1,290	46.4
Rotating Nozzles for Pop-up Spray Heads (30 minimum)	$6 each	26,161	115.1
Turf Replacement	$1 per square foot	9,150,468	702.5
In-stem Flow Regulator (25 device minimum)	$2 per device	7,965	23.9
Plumbing Flow Control Valve (20 device minimum)	$5 per device	343	2.9
Laminar Flow Restrictor (20 device minimum)	$10 per restrictor	926	21.8
Water Brooms[1]	-	10	1.5
Total Current Save a Buck Program	**-**	**-**	**9,182.9**
LADWP In-house Programs			
Commercial Showerheads	-	6,011	99
Commercial Faucet Aerators	-	14,068	65.1
Pre-Rinse Spray Nozzles	-	296	45.3
Water Brooms	-	59	9.1
Technical Assistance Program	-	-	1,610.5
LADWP Facility Retrofits	-	-	46.0
Recreation and Parks Department Irrigation Efficiency Program		-	193.1
SBDI Program	-	2,074	30.8
Multi-Family Direct Thermal Savings Program	-	97,463	733.1
Subtotal LADWP In-house	-		**2,832.0**
Total CII	**-**		**12,014.9**

1. Program has been discontinued.

Similar to the residential turf removal program, LADWP has a turf removal program for commercial properties. This program started in September 2009, and the rebate as of November 2015 is $1.00 per square foot of turf for the first 10,000 square feet and a minimum area of 250 square feet. For projects greater than 10,000 square feet the rebate is $0.50 per square foot for the portion of the area greater than 10,000 square feet and up to a maximum area of 43,560 square feet. Between FY 2010/11 and 2014/15 approximately 9.15 million square feet of turf was removed savings approximately 703 AFY.

Upon request, water-saving showerheads, faucet aerators, and pre-rinse spray nozzles are available to LADWP commercial customers, free of charge. Bathroom faucet aerators are provided in 1.5, 1.0, or 0.5 gpm, kitchen faucet aerators are provided in 1.5 gpm, and showerheads are provided in 2.0 gpm. Approximately 6,011 showerheads, 14,068 faucet aerators, and 296 pre-rinse spray valves were distributed between FY 2010/11 and 2014/15 saving approximately 210 AFY combined.

In March 2013, a Direct Install Partnership Program was implemented with LADWP and the Southern California Gas Company. Individual programs include:

- Los Angeles Unified School District Water Conservation Device Replacement Program – This program provides upgrades in energy, water, and gas efficiency. LADWP's Water Conservation Program provides funding for water efficient devices, including showerheads, faucet aerators, toilets, and urinal valves.

- Small Business Direct Install Program – This program targets business customers to reduce energy, water, and gas use. LADWP's Water Conservation Program provides funding for water efficient devices, including showerheads, faucet aerators, and pre-rinse spray nozzles.

- Multi-Family Direct Thermal Savings Program – This program targets multi-family units to reduce water and gas use. LADWP's Water Conservation Program provides funding for water efficient devices, such as showerheads and faucet aerators.

LADWP created the TAP in 1992 to provide custom-type incentives for retrofitting water-intensive equipment. Different from the Save Water Save a Buck Program, the TAP encourages site-specific projects, and TAP incentives are based on a given project's water savings. Financial incentives up to $250,000 are available for products demonstrating water savings. Incentives are calculated at the rate of $1.75 per 1,000 gallons saved over a two-year period with a cap not to exceed the actual cost of the installed product. Projects must save a minimum of 150,000 gallons over a two-year period and operate for a minimum of five years. Eligible customers are CII or multi-family residential customers. Past TAP projects include cooling tower controller upgrades and x-ray processor recirculation systems. Between FY 2010/11 and 2014/15, savings from new TAP projects are estimated at approximately 1,610.5 AFY. The following case studies highlight two of our successful TAP projects for supermarket evaporative condensers and coffee shops reverse osmosis machines.

Case Study:
WATER CONSERVATION – Retrofit of Evaporative Condensers at Supermarkets

Many supermarkets in the LADWP service area have cooling towers with evaporative condensers, presenting an excellent opportunity for significant water savings.

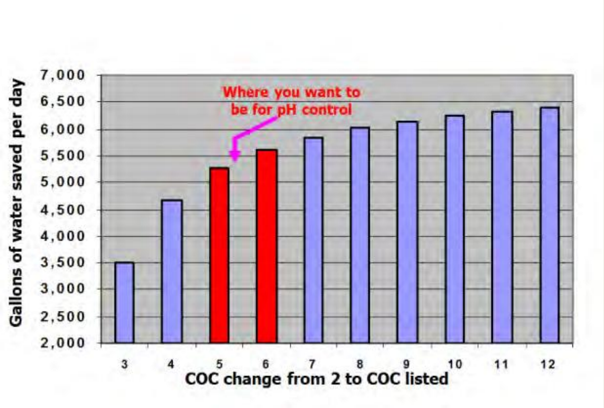
A cooling tower is a heat rejection device that extracts heat waste from the inside of a building to the atmosphere through the cooling of a water stream. Warm water is fed into the top of the cooling tower while air comes in from below. The water cools as it descends downward by gravity and is transferred back to the condenser in the cooler.

This case study addresses "evaporative" condensers, wherein a small portion of the cooled water evaporates into a moving air stream, providing cooling. The most common application of evaporative condensers in supermarkets is the cooling of circulating water used in the HVAC systems for temperature regulation.

Evaporative Condenser (note scale buildup on front right)

When pure water is evaporated, minerals are left behind in the recirculating water. As this process continues, the water becomes more concentrated, leading to saturated conditions. The term "Cycles of Concentration" (COC) compares the concentration of solids within recirculating water to that within the source water. Minerals in water are measured in µmhos (micromhos). Incoming LADWP water has a dissolved mineral concentration range of 300–600 µmhos. Therefore, if the mineral concentration in the evaporative condenser water is 3 times that of incoming water, then this is 3 COC. The majority of cooling towers are designed to maintain mineral concentrations between 2–3 COC, which is accomplished by bleeding water when 2-3 COC is reached and adding fresh water.

Increasing and optimizing COC is the key to water conservation. The following graph plots increasing COC against corresponding water savings. Research shows that the "sweet spot" for maximizing water savings is between 5–6 COC.



Increasing COC Yields Significant Water Savings

Water conservation can be achieved by retrofitting evaporative condensers with new water treatment equipment, such as upgraded controllers that measure conductivity, control the bleed valve, and monitor pH, all of which can be used to control COC.

New Generation Controller

Ralph's Supermarket teamed with U.S. Water Services to retrofit 55 evaporative condensers with new water treatment equipment, including: a 2-way communication controller, gravity-fed bromine dispenser (kills bacteria), educator (replacement for a normal pump in that there is a vacuum created to force the corrosion-scaling inhibitor chemical to go into the cooling tower), pH and conductivity probes, pulse make-up and pH meters, and a solenoid bleed valve. All equipment is connected to the controller, wherein adjustments can be made by an IT specialist in a remote location

.

By operating with higher COC, this project has resulted in significant water conservation, with water savings by store ranging from 300,000 gallons per year (gpy) to 1,000,000 gpy. Given the predominance of supermarkets in the LADWP service territory, there is opportunity to expand on this case study and achieve significant water conservation.

Case Study:

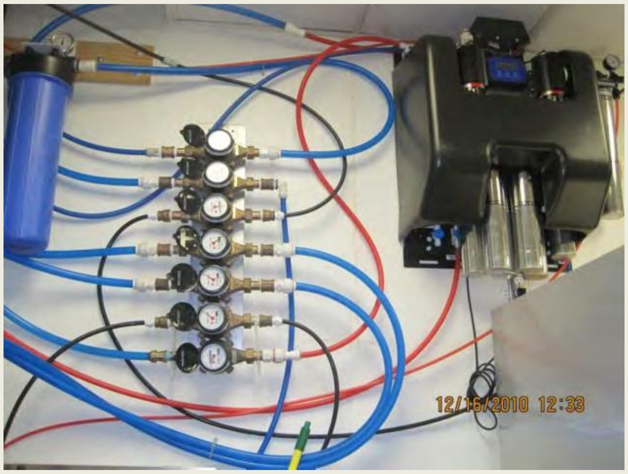
WATER CONSERVATION - Installation of New & More Efficient Reverse Osmosis Machines at Coffee Shops

Coffee shops are abound throughout the City. LADWP's water contains Total Dissolved Solids (TDS) (i.e., the organic & inorganic minerals contained in a liquid). TDS must be carefully controlled in the coffee-making process to: (1) achieve the desired product water and (2) protect the equipment. If there are no minerals present in the water used to make coffee, then minerals can be leached from the coffee and espresso machines, destroying pricey equipment. However, when the concentration of TDS in the water is too high, the solids can precipitate from the water, forming scale on heat transfer surfaces in equipment. Furthermore, minerals in the water enhance the taste of the coffee.

For a coffee shop, maintaining the appropriate TDS balance in product water is accomplished by using reverse osmosis (RO). RO separates dissolved solids from water by forcing water through a semi-permeable membrane. The resultant purer water is used as the product water, and the remaining water has concentrated amounts of dissolved solids that are discarded as waste, referred to as the RO waste stream.
One coffeehouse chain in the LADWP service territory uses RO, with a waste stream of approximately 75%. In other words, for every 1 cup of coffee produced, 3 cups of water are discarded in the RO waste stream.

For every 1 cup of coffee produced 3 cups of water are discarded in the RO waste stream

This coffeehouse chain applied to LADWP's Technical Assistance Program (TAP) for financial assistance to perform a water conservation study at 2 stores (from 2010-2011) using a more efficient RO machine, the *EverPure MRS-600HE-II High-Efficiency RO System*. Water conservation was achieved because this machine: (1) is more efficient, producing less waste stream and (2) includes a blend system. With the blend system, a portion of water undergoes treatment, and this treated water is then mixed with untreated water to maintain the desired TDS concentration, while markedly reducing the waste stream



Meters Installed on New RO Water Treatment System

To quantify water savings between the existing and new machine, meters were installed on the existing equipment, and consumption was measured for 53 days. Next, the new RO machine and appropriate metering were installed, after which consumption was measured for 53 days. The resulting water conservation was significant:

- Water treated at Store 1 was reduced from an average of 653 gallons per day (gpd) to 301 gpd.
- Water treated at Store 2 was reduced from an average of 903 gpd to 357 gpd.

Based on the average water savings at the test stores, the TAP incentive payment was calculated at $391 per store. Equipment and installation costs were $5,038 per store.

The coffeehouse chain built on the success of this study and went on to retrofit 28 additional stores, receiving an incentive of $391 per store. LADWP continued to monitor water consumption at the newly-retrofitted stores.

In 2013, changes were made to the TAP program that doubled the incentive payments. As a result, the coffeehouse chain was paid $738 per store for the next 15 stores retrofitted, and $757 per store for the following 13 retrofits. To date, the coffeehouse chain has retrofitted its RO systems at 58 stores in the LADWP service territory.

The primary water resource benefit from this project is enhanced water conservation. Not only do the new RO machines produce less waste stream, but they also require less water to be treated using the blend system. Additionally, this project offers an environmental benefit as less waste stream disposal is required.

Landscape Program

Recognizing that a substantial amount of water is used outdoors for irrigation, LADWP offers a variety of resources to assist customers interested in transforming traditional, high water using landscape to water-efficient sustainable landscaping. LADWP is committed to advancing a water efficient landscape transformation through promoting educational opportunities. Customers are encouraged to attend classroom and outdoor workshops that explain the benefits of installing low water use California Friendly plants, efficient irrigation systems, mulch, and water capture features.

Residents are encouraged to register for LADWP's bi-monthly California Friendly Landscape Training classes. The classes offer fundamental information about the benefits of using California Friendly plants and outdoor best management practices that result in lower water usage. Participants learn about the soil composition, site design, plant selection and efficient irrigation. Attendees of the California Friendly Landscape Training classes are eligible to participate in Hands On Workshops, located in the yard of a residential home with an active turf removal application, where they can apply principles learned in the classroom training. Additionally, participants learn turf removal techniques, rain barrel installation, rain water capture, and healthy soil construction.

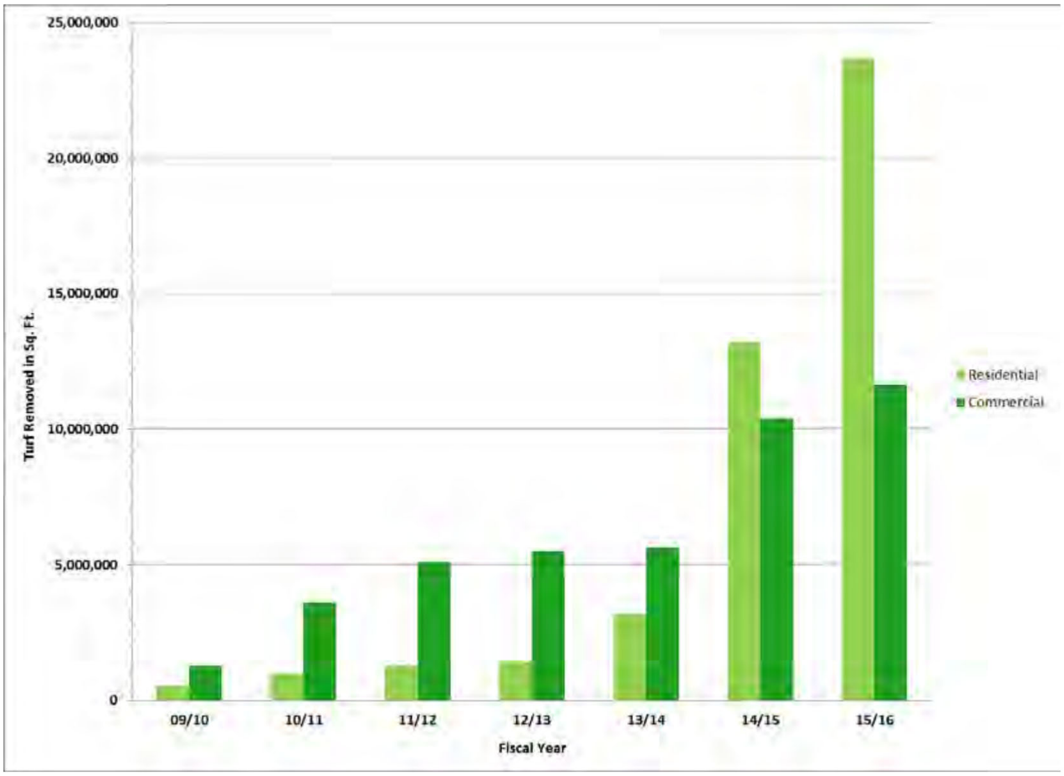
In Fall 2014, LADWP created its dedicated California Friendly Landscaping Website (www.ladwp.cafriendlylandscaping.com) to provide resources to residents interested in removing turf and switching to California Friendly plants. The California Friendly Landscape website is an interactive tool that allows customers to take virtual tours of California Friendly gardens, search for climate appropriate plants, and create shopping lists of plants for easy reference when visiting nurseries. Customers can also access planting templates created for Los Angeles' four regional climates. The templates can be used by the homeowner or provided to a contractor for installation of a California Friendly landscape. The website has been very popular with residents. In calendar year 2015, over 50,000 unique visitors used the website with over 1.2 million page visits.

Leading by example, LADWP has implemented a program to retrofit outdoor landscaping at LADWP's own facilities to California Friendly and native plantings with efficient irrigation systems. To date, over 827,449 square feet of retrofitted or newly constructed California Friendly landscaping has been installed. To demonstrate the beauty and appeal of a water-conserving landscape, LADWP's John Ferraro Building's California Friendly Garden was redesigned to showcase a variety of plants used primarily in Mediterranean and southwest designs. The newly designed garden includes educational signage explaining the benefits of introducing California Friendly and native plants and plant specific information accessible by scanning QR (quick response) codes on a mobile device.

Public engagement is an important component in advancing the water efficient landscape paradigm. Partnerships with other non-profits and organizations are used as leverage to reach large numbers of potential customers at well-attended community events. LADWP staff attend these community events to disseminate information about resources available to customers to reduce outdoor water use. Notable events include the Los Angeles Auto Show, Theodore Payne Native Garden Tour, the Natural History Museum's Nature Fest, and Summer Nights in the Garden series.

Thanks to LADWP's generous residential and commercial turf removal rebates, and its extensive outreach and education on California Friendly landscaping, participation has grown tremendously over the last few years. As of the end of calendar year 2015, LADWP has removed over 35 million square feet of turf as shown in Exhibit 3J.

Exhibit 3J
Cumulative Residential and Commercial Square Feet of Turf Removed By Fiscal Year



A joint effort between the Department of Recreation and Parks and LADWP is targeting public parks through the City Park Irrigation Efficiency Program. City parks with inefficient irrigation systems, leaks, and runoff problems are identified and upgraded with water efficient distribution systems and sprinkler heads, installation of smart irrigation controllers, and planting of California Friendly landscaping. In many cases, parks are connected to recycled water to reduce the dependence on our potable system. Since the program began in 2007, 21 parks have been completed. An additional benefit of this program is the educational, trade training, and employment opportunity given to the youth of Los Angeles.

Sustainable Landscaping

LADWP recognizes that, in addition to furthering water-efficient landscaping, it needs to focus on a more sustainable, "Watershed Approach" to landscaping. The Watershed Approach is a holistic and integrated approach for landscape sustainability that transcends water-use efficiency to address a variety of related benefits including abatement of dry-season runoff, onsite retention of stormwater, embedded energy savings, reduced green waste generation, reduced greenhouse gas emissions, reduced pesticide application, and enhance wildlife and insect habitat in urban settings. The Watershed Approach is meant to be a system-wide upgrade to the urban landscape environment.

In efforts to promote sustainable landscaping, LADWP is offering a variety of outreach and educational opportunities to the community. Currently, we are partnering with non-profit organizations to offer sustainable landscaping classes, hands-on-workshops, and professional training which incorporate different aspects of the Watershed Approach in the curriculum. In the near future, we plan to provide one-on-one landscape architectural consultations, develop landscape design templates, and expand sustainable landscaping outreach and classes to provide additional intermediate to advance level trainings. By adopting the Watershed Approach, LADWP will not only work towards its water conservation goals, but it will also promote a balance between water efficiency, watershed protection, environmental stewardship, and quality of life.

There is also potential for the use of non-potable water for irrigation, which can further promote sustainable landscaping and reduce the need for the City's traditional potable water supplies. Through the increased use of recycled water and stormwater capture, imported surface water and local groundwater used for landscape irrigation can be conserved. The potential to use such non-potable water supplies is further discussed in the Recycled Water and Watershed Management chapters (Chapters 4 and 7, respectively).

New Low Impact Development (LID) projects implemented within the City, along with innovative work by non-profit organizations, have also demonstrated pioneering ways to implement sustainable landscapes. As discussed in Chapter 7, LADWP's Watershed Management Group is proactively developing programs in conjunction with other departments to highlight water conservation through implementation of LID and stormwater BMPs. Additionally, a local non-profit, TreePeople, has partnered with various City departments, including LADWP on a number of stormwater capture projects.

For over a decade, TreePeople has demonstrated that rainwater is a viable local water resource. The Open Charter Elementary School Stormwater Project is one of several sustainable stormwater management systems that TreePeople installed in Los Angeles. Other examples include: the Center for Community Forestry which harvests rainwater from its entire hardscape into a 216,000 gallon underground cistern for landscape irrigation use; a retrofitted single family residential home in South Los Angeles that captures a 100-year storm event on site; and a 7,600 square foot subsurface stormwater infiltration gallery on the Broadous Elementary School campus in Pacoima. Additionally, TreePeople partnered with the Council For Watershed Health, LADWP, and other state and federal agencies to retrofit an entire residential block on Elmer Avenue in Sun Valley. This project now intercepts stormwater from 40 acres upstream and infiltrates it back to the aquifer while also demonstrating effective distributed stormwater BMPs on residential homes.

Most recently, TreePeople partnered with the Los Angeles County Flood Control District, Los Angeles Bureau of Sanitation, and LADWP on a pilot project to install cisterns on seven residential properties throughout Los Angeles. These cisterns will be connected to real-time weather controls, and will demonstrate the viability of increasing stormwater capture for groundwater recharge and on-site reuse in lieu of potable water. This project is scheduled to be completed by February 2016 and will be tested during the upcoming rain season.

In partnership with the Los Angeles County Department of Public Works, TreePeople was instrumental in developing the Sun Valley Watershed Management Plan: an alternative stormwater management plan that prioritizes green infrastructure and multi-benefit stormwater capture projects instead of stormdrains. Many projects have been completed, and more are scheduled for construction. These activities create the foundation for more sustainable landscaping that will lead to further landscape water conservation and stormwater capture to increase the water use efficiency of the City's limited water supplies.

LADWP has also partnered with The River Project on development of watershed management plans and stormwater capture projects. This partnership, in conjunction with various agencies and departments, was instrumental to the development of the Tujunga Wash Feasibility Study in 2000 and the Tujunga-Pacoima Watershed Plan in 2007. The River Project's emphasis of the Watershed Approach to stormwater management is evident in the implementation of the Woodman Avenue Green Infrastructure Project and the Water LA Pilot and Program of 2011 and 2014, respectively. The Woodman Avenue Green Infrastructure Project is discussed further in Chapter 7.

Water Loss Control

Maintaining water system infrastructure reduces water waste and allows for greater water accountability. Infrastructure maintenance is a high priority for LADWP. As discussed in Chapter 2, LADWP non-revenue water has an impressive historical 24-year average of 7 percent of the total water demand. LADWP maintains a 24 hour, 7 days per week leak response operation. Major blowouts that impact public safety are repaired immediately, and smaller leaks are fixed within 72 hours. Ongoing programs such as pipeline replacement, pipeline corrosion control, and meter replacement preserve the operational integrity of City water facilities and aim to reduce water losses.

In 2013, LADWP completed a full-scale Water Loss Audit and Component Analysis Study that complied with the requirements of California Assembly Bill 1420 (2009) and the California Urban Water Council's Best Management Practice 1.2. The study also included a full-scale assessment of LADWP's system databases and tracking efforts, as well as a pilot project that performed leak detection and analyzed system pressure and leakage in three service zones within the distribution system. The goal of the study was to identify system losses, determine economic optimum level of water losses, and identify, prioritize, and recommend efficient, cost-effective loss intervention strategies to minimize water loss.

Upon the completion of the Water Loss Audit and Component Analysis Study, LADWP established a Water Loss Task Force (Task Force) in 2014 consisting of over 100 staff from 8 different divisions in LADWP's Water System and Chief Administrative Office to work on addressing the recommendations from the previous study. The resulting Water Loss Action Plan (Action Plan) serves as a strategic guide that will coincide with LADWP's ongoing pipe maintenance plan to maintain the infrastructure for proficiency and reliability. The Action Plan addresses meter inaccuracies, database management, equipment testing, leak detection and prevention, and improved tracking of loss volumes. The Action Plan includes an assessment of feasibility, cost-effectiveness, and other benefits associated with implementation of the recommendations from the previous Water Loss Audit and Component Analysis Study, as well as a determination of how the recommendations may improve LADWP's Water System efficiency and meet California's regulatory requirements related to system water losses.

In recent years, the LADWP has ramped up its pipeline replacement program from 95,000 linear feet annually to 150,000 linear feet annually. Additionally, the LADWP Water System's Asset Management Group along with the Water Distribution Division are working to develop a predictive model that uses existing data relative to the factors which contribute to water main deterioration to determine a replacement priority for all pipe segments in the system. The results of this model along with criticality assessments and leak history can be used to focus replacement resources on pipe segments that are more likely to fail and disrupt service.

LADWP has also made significant progress in replacing and/or retrofitting water meters through its meter replacement program that started in 1988. As a result of extended flow or usage, the moving parts in a water meter can wear down and begin to under-register the actual water consumption. The meter replacement program has been valuable in ensuring the accuracy of the approximately 700,000 meters within the City. Recently, all of the large-sized meters (3-in and larger) in the system were replaced as part of a Large Meter Replacement Program, and the LADWP is also replacing 35,000 small meters annually.

As a result of proactive water loss strategies, LADWP has been able to keep its non-revenue and water loss numbers very low. For FY 2013/14, LADWP's non-revenue percentage was 5.6 percent and its real loss percentage was 3.9 percent. Non-revenue percentage for FY 2014/15's is currently unavailable as LADWP is still finalizing analysis on parameters required for the AWWA Water Balance. Non-revenue percentage from FY 2010/11 to 2013/14 averaged 5.9 percent, which shows that LADWP has an efficient, well-maintained Water System. LADWP's Water Loss Task Force will implement water loss strategies as detailed in the Action Plan to maintain low non-revenue and real loss percentages going forward.

3.3 Future Programs, Practices, and Technology to Achieve Water Conservation

Home Water Use Report Pilot Study

In December 2014, LADWP started its Home Water Use Report Pilot Study (Pilot). The Pilot is a water conservation engagement program that provides customer-specific education and outreach. A pilot group of approximately 72,000 single family customers are receiving bi-monthly home water use reports. These reports provide the customers with easy-to-understand information on their water usage, statistics on how they compare to similar households with average and efficient water use, and customized water saving tips and rebate recommendations.

The pilot study group also has access to an online web portal, which provides additional information and tools to help them reduce their water use. The portal provides information on historical water use, estimated breakdowns of how the customer is using their water, and videos provide additional resources on how to save water in their homes.

The Pilot will be completed by the end of 2017. At the end of the Pilot, LADWP will analyze results to determine the savings potential and cost-effectiveness of the program. Other utilities that have completed similar pilots have reported single family residential savings of up to 5 percent. The results of the Pilot will assist LADWP in planning a long-term program that targets the entire single family customer sector.

Advanced Metering Infrastructure

Advanced metering infrastructure (AMI) is the use of radio-based technology that provides for two-way communication between water meters and the utility's system. AMI provides real-time water meter data and provides an improved means to conserve water. Both the end user and the utility can monitor water use. On the utility side, the entire distribution system can be continuously monitored rather than attempting to analyze historic data based on meter reads. In turn, this allows the utility to find leaks at an earlier stage and reduce non-revenue water losses. On the customer side, AMI allows customers to determine their water use more often than a traditional bi-monthly or monthly bill. With the recently adopted rate structure, this type of information would motivate customers to proactively increase conservation sooner rather than after they receive their bill. Customers can also receive instant alerts if their usage is abnormally high, such as in response to a leak on their side of the meter that they previously might not have noticed until after they received a bill.

AMI coupled with a meter data management system, allows a water utility to create a long-term storage system for meter data that is collected and then allows the data to be analyzed overtime. Integration of AMI with a meter data management system allows a utility to improve conservation and achieve other benefits. With a meter data management system, utilities can instantly be alerted to system leaks. Additionally, conservation efforts can be quantified by accessing long-term data to review trends and benchmarks in response to conservation efforts. Without a data management system, historic analysis is limited solely to billing data.

Currently, LADWP is working on three different pilot projects to test the installation of AMI for the water distribution system:

- ACLARA/So Cal Gas AMI Pilot Project – This pilot project will explore the potential benefits of partnering with So Cal Gas in service overlap areas. The pilot will utilize the existing So Cal Gas utility network to explore the feasibility and reliability of obtaining meter readings using this system.

- Metron/Verizon Cellular – This pilot project will take advantage of the existing Verizon cell phone network to facilitate the installation of AMI units. The existing infrastructure and extensive phone network of transmission towers within the City boundaries facilitate the rapid installation of AMI. Due to the ease of installation and setup, the system is well suited for investigation of unusual usage.

- Itron AMI Pilot – This pilot project will offer the opportunity to utilize AMI technology for both water and power data by utilizing existing power infrastructure.

3.4 LADWP Water Conservation Potential Study

In early fall of 2014, LADWP initiated the Water Conservation Potential Study (WCPS) which will provide a better understanding of how historical water conservation investment efforts have impacted existing water use efficiency and device saturation levels. The WCPS will identify remaining water conservation opportunities to increase the City's water use efficiency into the future. The WCPS is the largest and most comprehensive conservation study in the US.

LADWP initiated the WCPS for multiple reasons:

- LADWP has always been a leader in conservation and this study will further advance its knowledge of conservation;

- LADWP has had a long running successful conservation program since the late 1970's that has resulted in savings of over 118,000 AFY related to hardware device savings, thus there is a need to understand the saturation levels of water appliances;

- LADWP needs to fully understand the remaining conservation potential in each customer sector to adequately plan for the future;

- Demand hardening effects in southern California need a carefully crafted response to achieve additional conservation; and

- LADWP's service area is very large with many diverse customer water needs, and a better understanding of this diversity may offer additional opportunities for water conservation savings.

3.4.1 Purpose of Study

An overarching goal of the WCPS is to help LADWP prioritize future water conservation investments in the City by understanding the remaining potential in water conservation for its service area. The remaining conservation potential will be identified for each customer sector: single family residential, multi-family residential, commercial, industrial, and governmental. The results from the WCPS will help LADWP develop a targeted conservation strategy to maximize water savings going forward. In addition, the WCPS will play an important role in LADWP's management of its water resources to meet both the State's requirement of a 20 percent reduction in per capita water use by 2020, and the City's pLAn goals for per capita potable water use reductions.

The main focus of the WCPS is to estimate the water conservation potential for four different levels (Exhibit 3K):

Naturally Occurring- The first step in estimating potential conservation is to estimate the natural occurring savings in water use that will occur through normal market forces, such as new development, remodeling, and compliance with plumbing/building codes and landscape ordinances. This is sometimes referred to as "passive" water conservation as it does not require incentives or significant utility costs to drive conservation.
The City of Los Angeles has relatively extensive building codes related to water conservation as previously discussed in this chapter. In addition to local ordinances, there are state and federal codes related to water conservation that effect water use within LADWP's service area, with state standards being more stringent than the national efficiency standards. Thus, both internal and external market forces will affect water use efficiency in the City.

Theoretical Maximum Potential- The theoretical maximum potential represents the water conservation savings that is achieved when all end uses of water are at the most efficient level given the current or emerging technology. Engineering estimates of technical efficiency and emerging technologies were researched from extensive literature review. The theoretical maximum potential is an estimate of the maximum potential conservation savings, regardless of cost or social acceptability.

Maximum Achievable Potential- The maximum achievable potential is a function of widespread adoption of new technology or behaviors by water customers. The maximum achievable potential does not consider cost, but does consider some levels of social acceptability. To achieve this maximum achievable potential would likely require significant increases in utility funding and customer education, and would also likely require additional City ordinances and conservation mandates for all water customers. As defined, the maximum achievable potential is a reflection of maximum, reasonable market saturation that can be achieved with unrestrained funding and aggressive program support, and would include implementation of many measures that are not yet cost-effective.

Maximum Achievable Potential that is Cost-Effective- The maximum achievable potential that is cost-effective represents the potential which is achievable, cost-effective, and considers customer acceptance. Economic potential savings is determined by applying economic tests to the maximum achievable potential with the goal of developing cost-effective measures when compared to the relative cost of an alternative water supply (in this case, imported water from MWD). This maximum achievable potential that is cost-effective would require increased financial incentives and perhaps implementation of direct install programs for many of LADWP's water conservation programs.

Exhibit 3K
Levels of Conservation Potential

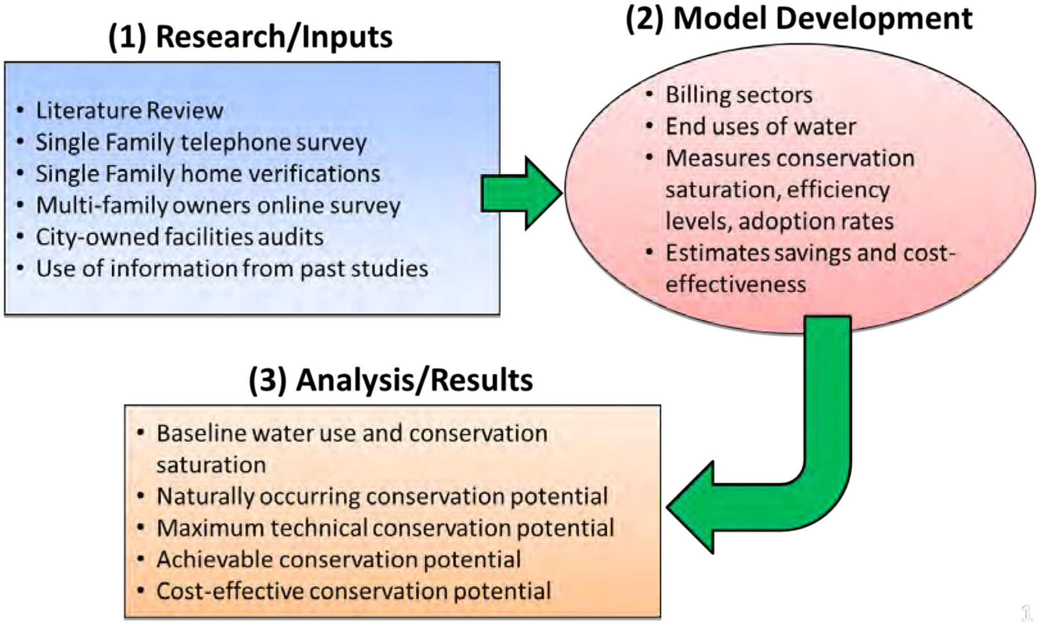
3.4.2 Study Approach

To develop the conservation potential for Los Angeles, an approach was developed containing three broad elements (see Exhibit 3L). Inputs to the study include reviewing existing literature and conducting water use surveys and audits throughout the City. Extensive research was conducted to locate and then review existing conservation literature for applicability to the WCPS. Literature reviews included both LADWP specific literature, where LADWP was a partial focus of the data and results, and other applicable literature sources. Included in the literature review were LADWP's CII Water Study and MWD's CII Study, which included audits of commercial facilities in LADWP's service area. Additionally, literature reviews were conducted to collect data on emerging water saving technologies applicable to the LADWP service area.

Single family home phone surveys and onsite verification surveys were conducted to determine saturation rates in the largest customer sector with over 450,000 accounts. Detailed telephone surveys were conducted for 615 single family residences. Telephone survey questions included age of home, presence of water using fixtures and appliances, lot size, type of landscape, method of landscape irrigation, and participation in LADWP's conservation rebates and programs. For a sub-set of these telephone survey respondents, 75 onsite verification surveys were conducted to provide for direct measurements and verify accuracy of telephone surveys. For these verification surveys, teams were sent to homes of customers who agreed to be visited and direct measurement/assessment was conducted of: lot size and irrigable areas; type of landscaping and irrigation method; flow rates for toilets, faucets, and showerheads; and presence of high-efficiency clothes and dish washers. Both of these single family surveys (telephone and onsite verification) provided a wealth of information on the presence and saturation level of water efficient devices in homes within LADWP's service area.

While there have been many single family water surveys conducted in the United States, assessing the potential for multi-family residents is much more difficult because most multi-family residents do not receive a water bill, and thus are not able to be identified for a survey. In addition, most multi-family residents are

Exhibit 3L
Major Elements of Water Conservation Potential Study



not able to change out water using fixtures and appliances without permission from landlords or owners of the multi-family units. To address this difficulty, LADWP decided to survey the multi-family owners/landlord/management companies in order to determine the current saturation of water appliances within the multi-family sector. This first-of-its-kind multi-family survey was conducted by sending an online survey link to all of LADWP's multi-family account holders (approximately 90,000). Approximately 4,000 responses were received. Survey data collected included the number of units serviced by the account, the type of multi-family property (e.g., apartments, condos, mobile homes, townhomes), age of the units, occupancy rate, common water using features, type of landscaping and method of irrigation, types of water using appliances in units or at site, when toilets were replaced, and participation in LADWP's conservation programs.

To help understand how water is currently being used within the government sector, detailed onsite water use audits were conducted for 100 city-owned facilities. Facilities audited included offices, libraries, Port of LA, Los Angeles International Airport, maintenance yards, wastewater treatment plants, parks, animal shelters, police and fire stations, and large street right away areas/medians. Data collected included the number of employees, ratio of male to female employees, average number of daily visitors, types of water using devices, fixture flow rates, number of restrooms, types of outdoor landscaping and methods of irrigation, presence of pools, ponds, or fountains, onsite laundry data, cooling tower operational data, car/equipment washing data, and kitchen/food preparation/break room areas.

To assess the conservation potential for commercial and industrial sectors, the WCPS utilized past studies on end uses of water from MWD and LADWP, as well as other studies obtained from literature review. The data from these other studies will be refined with data on water use per establishment and with information regarding LADWP's conservation program for commercial and industrial customers.

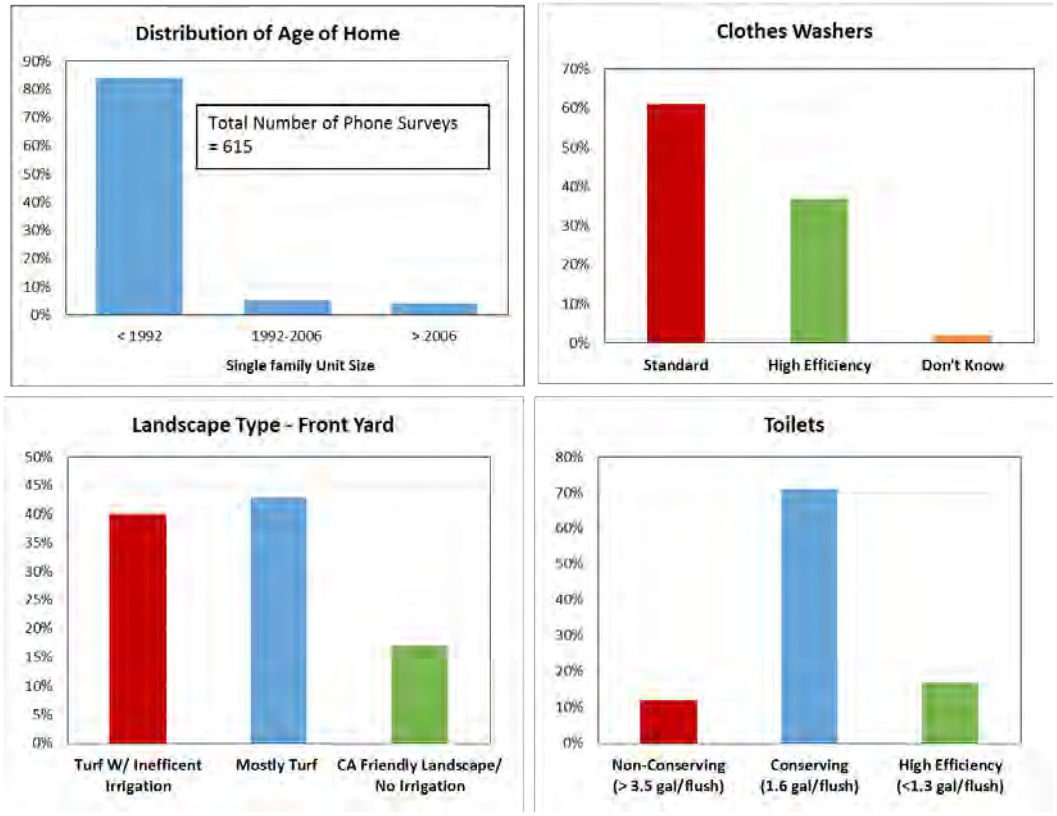
All of the collected data from these surveys and past studies are being entered into the Water Conservation Model (WCM). The model consists of 8 billing sectors and 19 end uses of water. End uses of water represent such things as toilet use, shower use, faucet use, clothes washing, landscape irrigation, and car washing for residential sectors; and sanitary uses, cleaning, cooling towers, water for cooking, and industrial process water use for non-residential sectors. The model measures presence, saturation and efficiency levels of end uses of water rolled up to single family, multi-family, commercial, industrial, and government sectors of water use. The WCM is being used to determine the conservation savings associated with different levels of potential. The WCM will also test the cost-effectiveness of new conservation measures in order to help LADWP design and implement its on-going conservation program.

3.4.3 Preliminary Saturation Findings

Single Family

Using data from the single family telephone surveys and onsite verification surveys, preliminary saturation of conservation was estimated for several end uses of water (see Exhibit 3M). The preliminary results indicate that despite the fact that over 80 percent of the single family homes in LADWP's were built prior to 1992 (when the California plumbing code required new homes to have 1.6 gallon per flush toilets), the saturation of conserving and high-efficiency toilets is quite high (over 80 percent). This would indicate that toilet rebate programs are reaching a saturation threshold and that natural market forces will drive efficiency for this end use of water.

Exhibit 3M
Preliminary Saturation for Select End Uses in Single Family Sector



However, the end uses of water for clothes washers and landscaping have far greater potential for increased water efficiency. The preliminary results show that less than 40 percent of single family homes have high-efficiency clothes washers and less than 20 percent of single family homes have California Friendly landscapes or are not using water for irrigation. This would indicate that rebates that target clothes washers and sustainable landscaping will have a significant impact on reducing these end uses of water for the single family sector.

Multi-Family

Using data from the multi-family online survey, preliminary saturation of conservation was estimated for several end uses of water (see Exhibit 3N). Similar to the single family sector, the preliminary results indicate that older, non-conserving toilets are even more saturated in the multi-family sector with little potential remaining. In fact, over 50 percent of multi-family toilets are already at high-efficiency, which is in large part thanks to LADWP's high-efficiency toilet rebate it offers to multi-family customers. The survey results also indicate a remaining conservation potential for the multi-family sector for common area clothes washers and landscape conversion. The preliminary results show that around 35 percent of multi-family homes have high-efficiency clothes washers and a little over 20 percent of the multi-family homes have California Friendly landscapes or no landscapes at all.

Exhibit 3N
Preliminary Saturation for Select End Uses in Multi-Family Sector

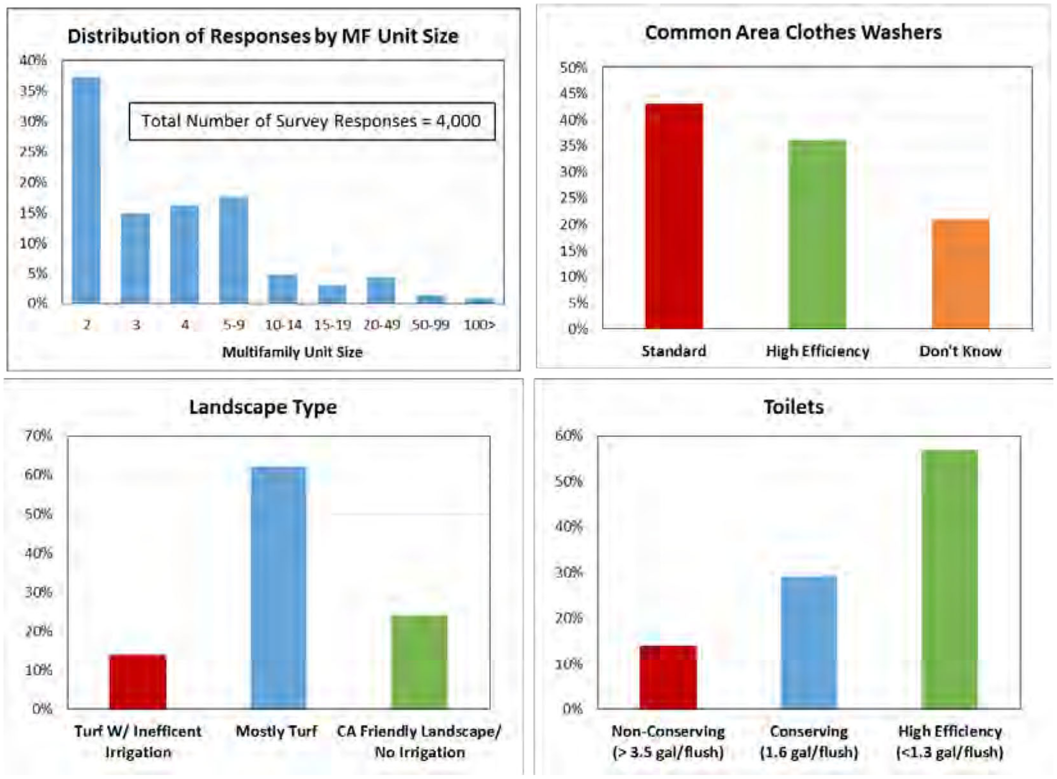
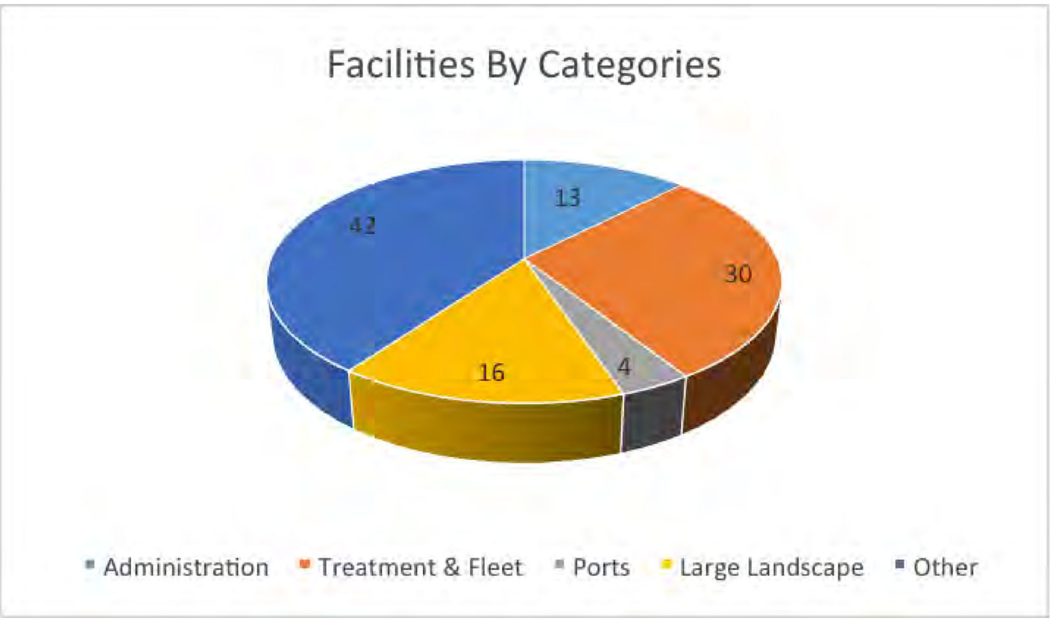


Exhibit 30
Breakdown of 100 City-Owned Facility Water Surveys



City-Owned Facility Surveys

The initial conservation potential summarized in Section 3.4.4 will be refined once the data from the City-owned facility water surveys has been thoroughly analyzed and entered in the WCM. Results from these surveys will provide water use refinements to the governmental and commercial sector of the WCM. During the past five months, detailed water surveys of 100 City-owned facilities were conducted on-site. Exhibit 30 presents the breakdown of the 100 facilities that were surveyed.

Trained water surveyors took measurements of water using devices and fixtures, took note of manufacturing details for cooling towers, measured landscape areas, identified landscape plants and irrigation sprinkler systems, and collected other important information. Preliminary results of indoor water using fixtures in LADWP's service territory show that toilets and urinals are over 70 percent saturated with high efficient devices (1.6 gallons per flush toilet and 0.5 gallons per flush urinal). The largest remaining potential for indoor water use for City-owned facilities, based on this sample, is showers, pre-rinse spray valves, and ice makers.

For those facilities with landscaping, preliminary results show about 15 percent have California-friendly plants (e.g., succulents, native warm-weather grasses and shrubs). This indicates a significant potential for more outdoor water efficiency improvements as the City moves towards sustainable landscaping.

In the next several months, survey data on irrigation efficiency/sprinkler systems and cooling towers will be analyzed. The final results of the City-owned facility water surveys will be used to refine the conservation potential for the entire City.

3.4.4 Conservation Potential Summary

The WCPS has two phases of analysis. Phase 1 represents an initial conservation potential that was estimated using the WCM (described earlier in this section) and the best available information regarding current end uses of water for single family, multi-family, commercial, industrial, and governmental sectors. Data from extensive and comprehensive residential surveys were used to determine the current saturation of conserving devices and practices. For non-residential sectors, a combination of previous studies conducted by both LADWP and MWD were used, as well as expert judgement from water conservation professionals with substantial experience in commercial and industrial water use and efficiency.

Phase 2, currently ongoing, will incorporate results from a comprehensive water survey of 100 City-owned facilities. The City-owned facility water surveys are still being fully analyzed and will be incorporated into a revised conservation potential that will be presented in the final WCPS report.

Initial Conservation Potential

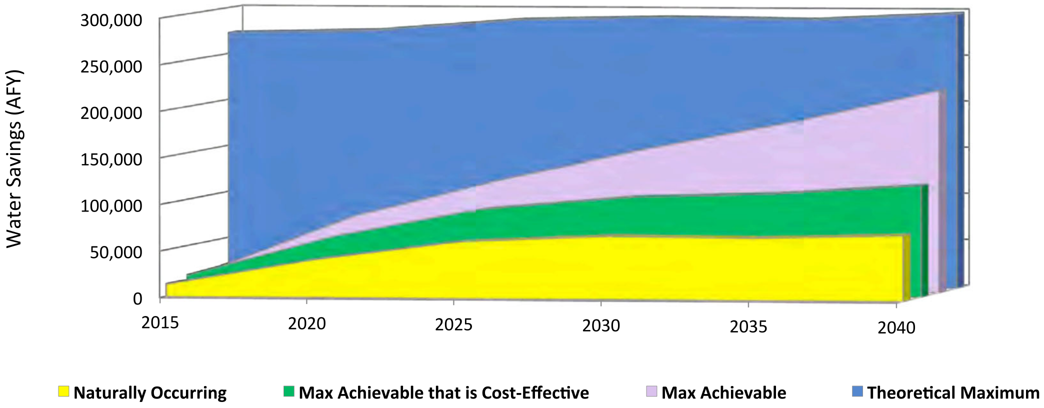
The initial conservation potential results are shown for the year 2040 in Exhibit 3P. These conservation savings represent the additional water savings, post FYE 2015, that could occur under the different levels of potential that were evaluated in this study. Naturally occurring savings represents the conservation from natural replacement, new development adhering to building/plumbing codes, and ordinances for landscape water use. By 2040, approximately 71,000 AFY of additional conservation is expected to be achieved naturally, with multi-family and single family residential being the largest contributors.

When LADWP funding for conservation programs is increased (sometimes double of current program levels), the conservation potential increases to maximum potential that is cost-effective increases to approximately 120,000 AFY (which is inclusive of the 71,000 AFY from naturally occurring savings). Assuming that roughly 75 percent of the theoretical maximum conservation potential could occur by 2040, the maximum achievable conservation potential increases to approximately 218,000 AFY (which is inclusive of naturally occurring and maximum achievable that is cost-effective savings).

Exhibit 3P
Water Conservation Potential Post FYE 2015 (AFY)

FYE	Naturally Occurring	Maximum Achievable that is Cost-Effective	Maximum Achievable	Theoretical Maximum
2020	41,000	61,000	79,000	276,000
2025	62,000	92,000	119,000	289,000
2030	68,000	106,000	153,000	292,000
2035	67,000	110,000	183,000	290,000
2040	71,000	120,000	218,000	298,000

Exhibit 3Q
Water Conservation Potential Post FYE 2015 Over Time (AFY)



The above conservation potential is also graphically illustrated and presented over time, as shown in Exhibit 3Q. For the theoretical maximum potential, the assumed efficiency of all end uses of water occurs on day one. The remaining conservation potentials increase over time based on the level of customer participation, derived by examining 1) historical levels of participation in LADWP's conservation programs; 2) advanced levels of participation assuming direct install conservation programs, and; 3) very aggressive levels of customer participation that would likely be driven by utility rebates that are in excess of cost-effective levels and by City regulatory mandates and additional ordinances.

3.5 Cost & Funding

More than $350 million has been invested in water conservation by LADWP during the last ten years. Conservation is the cornerstone of LADWP's water demand management activities. Ongoing investments will be made in cost-effective programs, subject to funding availability and LADWP's ability to implement such programs. The cost range of conservation rebates, incentives, and hardware installation programs ranges from about $50/AF to $1300/AF based on current LADWP conservation programs. LADWP's overall Water Conservation Program currently saves water at an average cost of approximately $400/AF. Outside sources of funding are sought to supplement the City's budget for conservation. A stronger commitment is also being made to acquire additional grant funding for City conservation projects and programs.

Currently, the funding sources for conservation are:

- **Water Rates** – Water conservation programs are primarily funded through water rates.
- **MWD Conservation Credits Program** - MWD offers both commercial and residential rebates to member agency customers that install qualifying conservation devices. In addition, MWD reimburses LADWP for pre-approved Technical Assistance Program projects when completed.
- **Outside Agency Co-Funding** - Other outside agencies that realize benefits from conservation programs are solicited to co-fund program costs.

- **Grant Funding** - LADWP will actively pursue available water conservation grant funding from Proposition 1 and other State and Federal grants. Some recent grants LADWP has received include:

- **Water Loss Audit and Component Analysis Study:** A Bureau of Reclamation Water Conservation Field Services Program grant was applied towards a professional services contract to retain an independent consultant to conduct LADWP's first comprehensive Water Loss Audit & Component Analysis Study. Total grant award of $100,000 for LADWP's $300,000 project. Completion Date in 2013.

- **Commercial/Industrial Drought Resistant Landscape Incentive Program**: A Bureau of Reclamation Water Use Efficiency Grant was applied towards LADWP's CII Turf Removal Program to replace turf with California Friendly landscaping. Total grant award of $1,000,000. Completion Date in 2013.

Chapter Four

Recycled Water

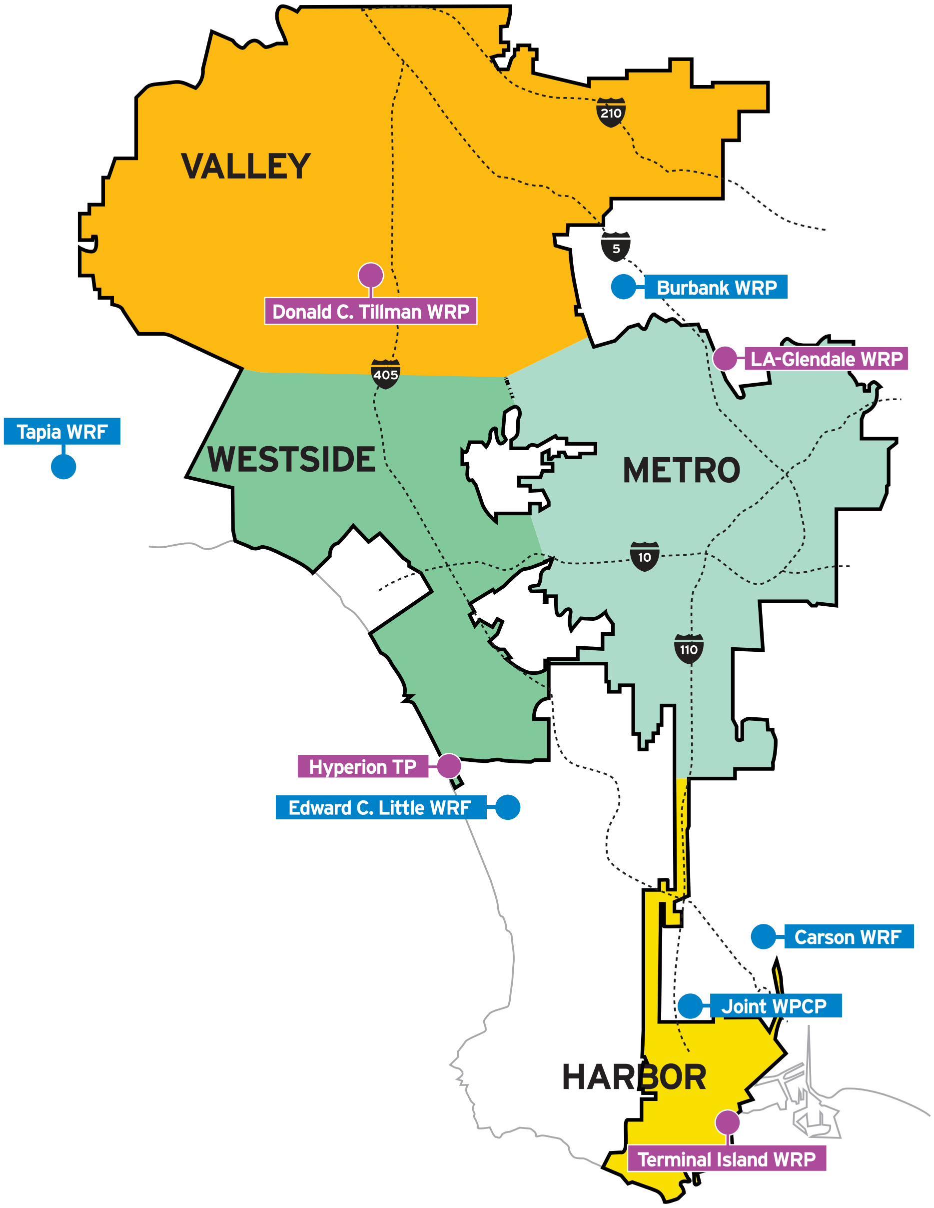
4.0 Overview

LADWP is committed to significant expansion of recycled water in the City's water supply portfolio. In response to multiple factors that are decreasing the reliability of imported water supplies and the ongoing drought, Mayor Eric Garcetti released Executive Directive No. 5 (ED5) on October 14, 2014 and the Sustainable City pLAn (pLAn) on April 8, 2015. ED5 established the goal of reducing purchased imported potable water use by 50 percent by 2024. The pLAn extends the purchased imported potable water use reduction goal to 2025 and sets an additional goal of increasing local water sources to 50 percent by 2035. Expansion of recycled water use to offset potable demands has been recognized as one method that will help achieve these goals. Concurrently, the pLAn document establishes specific goals for recycled water use as described in Section 1.2.2 of this UWMP. In order to meet these goals, LADWP is working in conjunction with the Los Angeles Department of Public Works Bureau of Sanitation (LASAN) and Bureau of Engineering (BOE), to develop non-potable reuse projects for irrigation and industrial uses. In addition, the City is pursuing a groundwater replenishment (GWR) project to replenish the San Fernando Groundwater Basin with highly treated recycled water. Additional opportunities to further expand the City's recycled water use over the long-term are also being studied.

LADWP's water recycling program is dependent on the City's wastewater treatment infrastructure and wastewater treatment facilities located within and outside of the City's boundaries. Wastewater in the City of Los Angeles is collected and transported through approximately 6,500 miles of major interceptors and mainline sewers, more than 11,000 miles of house sewer connections, 46 pumping plants, and four wastewater treatment plants. LASAN is responsible for the planning and operation of the City's wastewater treatment infrastructure and wastewater treatment facilities. The City's wastewater system serves 573 square miles, 456 square miles of which are within the City. Wastewater service is also provided to 29 non-City agencies through contract services. The treated effluent from the City's four wastewater plants is utilized by LADWP to meet recycled water demands both inside and outside the City.

LADWP's water recycling program also utilizes wastewater facilities located outside of the City. Currently, the Hyperion Water Reclamation Plant (HWRP) serves a portion of its secondary treated wastewater to West Basin Municipal Water District's (WBMWD) Edward C. Little Water Recycling Facility (ECLWRF) where it undergoes further treatment in order to meet recycled water standards. A portion of the product water from the ECLWRF is returned to LADWP to meet the City's recycled water needs. Upon completion of currently planned recycled water projects, LADWP will enter into agreements with neighboring agencies to obtain recycled water from their wastewater treatment plants for use in LADWP's service area. These facilities and respective agencies include: Carson Regional Water Recycling Facility (Carson Facility) operated by WBMWD, Burbank Water Reclamation Plant (BWRP) operated by the City of Burbank Department of Public Works, and Tapia Water Reclamation Facility (TWRF) operated by Las Virgenes Municipal Water District (LVMWD). The Joint Water Pollution Control Plant (JWPCP), operated by Sanitation Districts of Los Angeles County, is being evaluated in partnership with the Metropolitan Water District of Southern California to become a water reclamation plant, which will become a future source of recycled water for the City. Exhibit 4A shows the City's four recycled water service areas in relation to the City's four wastewater treatment plants (purple) and existing and future sources of recycled water located outside of the LADWP service area (blue).

Exhibit 4A
Wastewater Treatment Plants and Existing and Future Sources of Recycled Water for LADWP Service Area



As early as 1960, the City recognized the potential for water recycling and invested in infrastructure that produced water of tertiary quality, a high treatment standard for wastewater. These investments resulted in the construction of tertiary wastewater treatment plants (Donald C. Tillman WRP, LA-Glendale WRP) instead of enlarging the two existing terminus treatment plants (Hyperion WRP, Terminal Island WRP). These system enhancements facilitated the City's expanded use of recycled water, which now offset a significant amount of imported water supplies. The original policy allowing the use of recycled water was ultimately adopted by the State Legislature in 1969.

In 1979, LADWP began delivering tertiary quality recycled water to the Department of Recreation and Parks for irrigation of various areas in Griffith Park. This service was later expanded to include Griffith Park's golf courses. In 1984, freeway landscaping adjacent to the park began to be irrigated with recycled water. When the Donald C. Tillman Water Reclamation Plant (DCTWRP) came online in 1985, the City created the Japanese Garden, Lake Balboa, and the wildlife lake in the Sepulveda Basin as environmental mitigation. The Greenbelt Project, which carries recycled water from the Los Angeles-Glendale Water Reclamation Plant (LAGWRP) to Forest Lawn Memorial Park, Mount Sinai Memorial Park, Lakeside Golf Club of Hollywood and Universal Studios, began operating in 1992, and was LADWP's first project to supply recycled water to non-governmental customers. LADWP continues to expand the use of recycled water to various customers. In 2009, Phase 1 of the Playa Vista development began receiving recycled water. Playa Vista is the first planned development in the City that uses recycled water for all landscape needs. LADWP serves approximately 48 locations in the City with recycled water for irrigation, industrial, and environmental beneficial uses. There are approximately 200 individual customer service accounts, with several projects containing multiple customer accounts at a single location. Future recycled water projects will continue to build on the successful implementation of these prior projects so that recycled water becomes a more prominent component of the City's water supply portfolio.

The City's water recycling program seeks to displace the use of potable water with recycled water for non-potable uses where infrastructure is available. In compliance with the California Water Code Section 13550-13557 recycled water served by LADWP meets all of the following conditions:

- The source of recycled water is of adequate quality for these non-potable uses.
- The recycled water may be furnished for these uses at a reasonable cost to the user.
- The use of recycled water from the proposed source will not be detrimental to public health.
- The use of recycled water will not adversely affect downstream water rights or degrade water quality.

In addition, the California Water Code mandates that public agencies, such as the LADWP, serve recycled water for non-potable uses if suitable recycled water is available.

LADWP is expanding irrigation and industrial/commercial uses of recycled water. LADWP is also planning to implement a GWR project utilizing highly treated recycled water to recharge the San Fernando Groundwater Basin. Demand for recycled water has expanded as customer acceptance of recycled water as a viable economical alternative to traditional potable supplies has increased. Outreach efforts designed to inform the public on the viability of recycled water and its potential uses are an essential part of the process as the City's recycled water program expands.

4.1 Regulatory Requirements

Recycled water use is governed by regulations at the State and local levels. These regulations are based on multiple factors including the type of use and the quality of the recycled water. LADWP currently provides recycled water for non-potable uses and is pursuing indirect potable reuse through a GWR project. Requirements for non-potable and indirect potable categories of recycled water use are different. This section provides a summary of non-potable and indirect potable recycled water regulations.

4.1.1 Non-Potable Reuse Regulations

Non-potable water reuse regulations in the City of Los Angeles are governed by the State Water Resources Control Board (SWRCB), Los Angeles Regional Water Quality Control Board (LARWQCB), and the Los Angeles County Department of Public Health (LACDPH). The SWRCB Division of Drinking Water (DDW), previously under the jurisdiction of the California Department of Public Health, was transferred to the SWRCB on July 1, 2014.

State Water Resources Control Board (SWRCB) and Los Angeles Regional Water Quality Control Board (RWQCB)

Criteria and guidelines for the production and use of recycled water were established by the SWRCB in the California Code of Regulations, Title 22, Division 4, and Chapter 3 (Title 22), updated June 14, 2014. Title 22, also known as the Uniform Statewide Recycling Criteria, establishes required wastewater treatment levels and recycled water quality levels dependent upon the end use of the recycled water. Title 22 additionally establishes recycled water reliability criteria to protect public health.

Title 22 specifies recycled water use restrictions based on the potential degree of public exposure to the water and the distance of drinking water wells and edible crops from the area of intended use. Recycled water use applicability also depends on the different levels of treatment. A higher quality water will have a wider variety of applicable uses than a lower quality water. At a minimum, secondary treatment of wastewater is required for recycled water use. In Los Angeles, however, all recycled water used is treated, at a minimum, to tertiary levels with additional disinfection. Title 22 allows for other treatment methods, subject to SWRCB approval. The reliability of the treatment process and the quality of the product water must meet Title 22 requirements specified for each allowable treatment level. Wastewater treatment levels are discussed in detail in subsection 4.2 of this chapter. Exhibit 4B provides a summary of the currently approved recycled water uses.

Exhibit 4B
Allowable Title 22 Recycled Water Uses

Irrigation Uses
Food crops where recycled water contacts the edible portion of the crop, including all root crops
Parks and playgrounds
School yards
Residential landscaping
Unrestricted access golf courses
Any other irrigation uses not prohibited by other provisions of the California Code of Regulations

Food crops, surface irrigated, above ground edible portion, and not contacted by recycled water
Cemeteries
Freeway landscaping
Restricted access golf course
Ornamental nursery stock and sod farms where no recycled water use occurs 14 days prior to harvesting , retail sale, or access by the public
Pasture for milk animals for human consumption
Non edible vegetation with access control to prevent use as park, playground or school yard
Orchards with no contact between edible portion and recycled water
Vineyards with no contact between edible portion and recycled water
Non-food bearing trees, including Christmas trees not irrigated less than 14 days before harvest
Fodder and fiber crops and pasture for animals not producing milk for human consumption
Seed crops not eaten by humans
Food crops undergoing commercial pathogen destroying processing before consumption by humans
Supply for Impoundment Uses
Non restricted recreational impoundments, with supplemental monitoring for pathogenic organisms in lieu of conventional treatment
Restricted recreational impoundments and publicly accessible fish hatcheries
Landscape impoundments without decorative fountains
Supply for cooling or air conditioning
Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or spraying that creates a mist
Industrial or commercial cooling or air conditioning not involving cooling tower, evaporative
condenser, or spraying that creates a mist
Other Uses
Dual plumbing systems (flushing toilets and urinals)
Priming drain traps
Industrial process water that may contact workers
Structural fire fighting
Decorative fountains
Commercial laundries
Consolidation of backfill material around potable water pipelines
Artificial snow making for commercial outdoor uses
Commercial car washes, not heating the water, excluding the general public from washing process
Industrial process water that will not come into contact with workers
Industrial boiler feed
Nonstructural fire fighting
Backfill consolidation around non potable piping
Soil compaction
Mixing concrete
Dust control on road and streets
Cleaning roads, sidewalks and outdoor work areas
Flushing sanitary sewer
Groundwater recharge

Sites where recycled water is used must meet regulatory requirements. Title 22 stipulates use area requirements to protect public health. Use area regulations include requirements addressing recycled water application methods, and requirements addressing runoff near domestic water supply wells, drinking fountains, and residential areas. Other requirements include posting signs notifying the public where recycled water is being used, utilization of quick couplers instead of hose bibs, and the prohibition against connecting recycled water systems with potable water systems. Dual-plumbed recycled water systems in buildings are also addressed. These systems must meet additional reporting and testing requirements.

To protect public health, Title 22 requires reliability mechanisms. During the design phase, a Title 22 Engineering Report is required to be submitted to SWRCB and the local Regional Water Quality Control Board (RWQCB) for approval. Contents of the report include a description of the system and an explanation regarding how the system will comply with Title 22 requirements. Redundancy in treatment units or other means to treat, store, or dispose of recycled water are required in case the treatment unit is not operating within specified parameters. Alarms for operators are required to indicate treatment plant process failures or power failures. In case of power failures, either back-up power, automatically activated short-term or long-term recycled water storage, or a means of recycled water disposal is required. Furthermore, system performance must be monitored by water quality sampling and analyses. The SWRCB continues to develop regulations and guidance for recycled water use. Future regulations regarding the augmentation of surface water with recycled water are currently under development. These regulations are required to be adopted by December 31, 2016. By this time, the SWRCB must also report to the Legislature regarding the feasibility of developing uniform criteria for direct potable use of recycled water.

As mentioned previously, cross-connections between the potable and recycled water systems are not permitted. The California Code of Regulations, Title 17, Division 1, Chapter 5, Group 4, updated June 18, 2014, was developed to prohibit cross-connections between potable water supply systems and recycled water supply systems. Title 17 requires water suppliers to implement both cross-connection control programs and backflow prevention systems. Draft regulations for Cross Connection Control, first released in 2005, are now in the process of being further revised by the SWRCB. In addition to Title 22 and Title 17 requirements, SWRCB has additional regulations and guidance established in the following documents:

- Guidelines for the Preparation of an Engineering Report for the Production, Distribution, and Use of Recycled Water (2001)
- Draft Analysis and Reporting of Non-Target Volatile Organic Compounds (2003)
- Draft Analysis and Reporting of Non-Target Semi-Volatile Organic Compounds (2003)
- Guidance Memo No. 2003-02: Guidance for the Separation of Water Mains and Non-Potable Pipelines (2003)
- Alternative Treatment Technology for Recycled Water (2014)

In May 2009, the SWRCB adopted the “Recycled Water Policy” developing uniform standards across all RWQCB’s for interpreting the “Anti-Degradation Policy”. In 2013 the “Recycled Water Policy” was amended to reduce priority pollutant monitoring for landscape irrigation using recycled water and established requirements for monitoring constituents of emerging concern and their surrogates when recycled water is utilized for groundwater recharge. When planning and implementing recycled water projects the following must be taken into consideration:

- Benefits of recycled water – use of recycled water when sufficiently treated to not adversely impact human health and the environment has a beneficial impact, especially when recycled water substitutes for potable water use.

- Mandate for recycled water use – encourages recycled water use and establishes targets to increase use.

- Salt/nutrient management plans – requires submittal of salt/nutrient management plans by 2016 or an anti-degradation analysis will be required.

- Landscape irrigation projects' control of incidental runoff and streamlined permitting – addresses controlling incidental runoff and streamlining permit processes for recycled water use in landscape areas.

- Groundwater replenishment – establishes requirements for groundwater replenishment projects, including review on a project-by-project basis.

- Anti-degradation – establishes that salt and nutrient management plans can address groundwater quality impacts.

- Constituents of emerging concern – a blue-ribbon advisory panel developed a report on constituents of emerging concern leading to the latest "Recycled Water Policy" amendment; the report will be updated by the panel every five years.

- Incentives for recycled water – establishes that priority funding may be available for projects with major recycling components; waste load allocations will be assigned for municipal wastewater sources to provides an incentive for recycling; and allows less stringent monitoring for stormwater treatment and reuse projects than projects with untreated stormwater discharges.

Water recycling requirements for each of the City's applicable wastewater treatment plants engaged in water recycling are issued by the LARWQCB. These requirements specify end-users of recycled water and enforce treatment and use area requirements.

In July 2009, the SWRCB adopted a general landscape irrigation permit, "General Waste Discharge Requirements for Landscape Irrigation Uses of Municipal Recycled Water" (General Permit). The General Permit streamlines the regulatory approval for landscape irrigation using recycled water. Agencies with existing water recycling requirements, such as the City, are not required to apply for the General Landscape Irrigation Permit.

Earlier in April 2009, the LARWQCB adopted a general region-wide permit, "General Waste Discharge and Water Recycling Requirements for Non-Irrigation Uses over the Groundwater Basins Underlying the Coastal Watersheds of Los Angeles and Ventura Counties" for non-irrigation uses of recycled water. Similar to the General Permit, this permit streamlines the permitting process and specifies the application process for qualifying projects.

Los Angeles County Department of Public Health (LACDPH)

Title 22 and Title 17 water use regulations are enforced by the LACDPH, Environmental Health Division. LACDPH has published "A Guide to Safe Recycled Water Use, Pipeline Construction and Installation" requiring compliance with Title 22, SWRCB, and LARWQCB requirements. After SWRCB has approved the plans and specifications and the City has an agreement to serve the customer, LACDPH reviews and approves all plans and specifications prior to construction. After construction LACDPH inspects the systems and conducts cross-connection, pressure, and back-flow prevention device tests. Recycled water use must be in compliance with the Los Angeles County Recycled Water Advisory Committee's "Recycled Water Urban Irrigation User's Manual". Each site must also have a site supervisor responsible for recycled water use.

City of Los Angeles

Recycled water responsibilities of the City of Los Angeles include complying with all LARWQCB permits for the wastewater treatment plants and production of recycled water, approving recycled water use sites, conducting post-construction inspections, and periodically inspecting use areas and site supervisor records.

LADWP customers are permitted to use recycled water when service is available per LADWP Ordinance No. 170435 (subsequently amended by Ordinance No. 182047 in 2012). Customers expressing interest in recycled water deliveries must enter into an agreement with LADWP, subject to approval of the Board of Water and Power Commissioners. Users are responsible for the operation and maintenance of their recycled water systems up to the connection point with LADWP. Users are required to use recycled water in accordance with Titles 22 and 17 and the "Recycled Water Urban Irrigation User's Manual". If the users fail to follow these regulations, LADWP may cease delivery of recycled water.

4.1.2 Indirect Potable Reuse (IPR) Regulatory Requirements

Regulations governing IPR and GWR are established by the DDW and LARWQCB under the SWRCB. The City's GWR project as described in section 4.4.2 will be subject to these regulations.

For GWR, the City is planning to implement a spreading project that may include the following treatment technologies: microfiltration, reverse osmosis, ozone, biological activated carbon, and/or advanced oxidation. Pilot projects are being conducted to determine the most cost-effective treatment strategy that will help the City maximize groundwater replenishment with recycled water.

Regulatory oversight of IPR projects is provided by the DDW and LARWQCB. The DDW regulates IPR projects under Title 22, making recommendations on a case-by-case basis to the LARWQCB after a public hearing. Title 22 was amended on June 18, 2014 to include requirements for groundwater replenishment with recycled water. Regulations are provided for both subsurface and surface applications of recycled water. As previously stated for non-potable reuse, Title 22 regulations are designed to protect public health.

IPR projects are approved on a case-by-case basis by the LARWQCB. As part of the application process, a Title 22 Engineering Report must be submitted. Specific requirements of the Engineering Report are provided in Title 22. Prior to project review and before the DDW submits their recommendations to the LARWQCB, the project sponsor must hold a public hearing. A public hearing must also be held if a project sponsor wants to increase the use of recycled water recharge beyond the approved permit limits. After the public hearing, the LARWQCB reviews the recommendations by DDW with considerations of the provisions in Title 22, and the adopted Los Angeles Basin Plan for the LARWQCB region, applicable State policies (including the DDW Recycled Water Policy), and applicable federal regulations if recycled water is discharged to "Waters of the U.S.". The Basin Plan establishes water quality objectives for surface water and groundwater to protect beneficial uses.

Prior to operation of an IPR project, the sponsor must prepare an Operation Optimization Plan for review and approval by the DDW and LARWQCB. The plan describes the operations of the project, specifies how the project will meet minimum standards and ongoing monitoring requirements in Title 22, maintenance procedures, analytical methods to be used, and describes how results will be reported to the DDW and LARWQCB.

4.2 Sources of Recycled Water

Recycled water production relies on treated wastewater obtained from the City's wastewater treatment plants and in the future will include wastewater treatment plants operated by neighboring agencies. There are four wastewater treatment plants owned and operated by LASAN. City wastewater treatment consists of a series of processes that, at a minimum, remove solids to a level sufficient to meet regulatory water quality standards. During the preliminary, primary, secondary, and tertiary treatment processes, progressively finer solid particles are removed. Preliminary treatment removes grit and large particles through grit removal basins and screening. Primary treatment relies on sedimentation to remove smaller solids. With most of the grit, large particles, and solids already removed, secondary treatment converts organic matter into harmless by-products and removes more solids through biological treatment and further sedimentation. At the end of secondary treatment, most solids will have been removed from the water. Tertiary treatment follows secondary treatment to eliminate the remaining impurities through filtration and chemical disinfection. At this stage, sodium hypochlorite (the chemical contained in household bleach) provides disinfection.

All recycled water used within the City undergoes, at a minimum, tertiary treatment and disinfection. In West Los Angeles, recycled water produced via WBMWD's ECLWRF provides varying levels of advanced treatment based on customer needs including reverse osmosis (RO), microfiltration/reverse osmosis (MF/RO), and double pass RO. MF/RO is a two-stage process using high-pressure membrane filters to remove microscopic impurities from the source water. Double pass RO involves passing the water through a reverse osmosis system twice to produce highly purified water.

Exhibit 4C summarizes the treatment levels, capacity, and FY 2014/15 wastewater flows at the four City plants and the four plants outside the City. Among the plants outside the City, the ECLWRF uses treated wastewater from HWRP, with a portion of ECLWRF's tertiary treated effluent going to the Carson Facility for further treatment. The other three facilities treat wastewater generated outside the City.

Exhibit 4C
Sources of Recycled Water Summary

Sources of Recycled Water	Wastewater Collection/ Treatment Agency	Treatment Level(s)	Wastewater Treatment Capacity (AF)	Treated Wastewater FY 14/15[6] (AF)	Recycled Water Served to LA FY 14/15[6] (AF)	In-plant/ RW Served Outside LA FY 14/15 (AF)	Discharged Treated Wastewater FY 14/15 (AF)
Located within City of Los Angeles							
Donald C. Tillman Water Reclamation Plant (DCTWRP)[1]	LA Department of Public Works - LASAN	Tertiary to Title 22 Standards with Nitrification/ De-nitrification	89,600	38,000	28,200	3,400	6,400

Los Angeles - Glendale Water Reclamation Plant (LAGWRP)[1]	LA Department of Public Works - LASAN	Tertiary to Title 22 Standards with Nitrification/ De-nitrification	22,400	16,000	2,500	2,500[2]	11,000
Terminal Island Water Reclamation Plant (TIWRP)[1]	LA Department of Public Works - LASAN	Tertiary, Title 22 Standards with Advanced Treatment of 6 mgd MF/RO	33,600	18,000	4,300	1,200	12,500
Hyperion Water Reclamation Plant (HWRP)[1]	LA Department of Public Works - LASAN	Secondary	504,000	294,000	0	50,500[3]	243,500
Located Outside City of Los Angeles							
Edward C. Little Water Recycling Facility (ECLWRF)[1,5]	WBMWD	Tertiary to Title 22 Standards; RO; MF/RO; MF with double-pass RO	N/A	N/A	900	37,400	N/A
Carson Regional Water Recycling Facility (Carson Facility)[1,4,5]	WBMWD	MF/RO/ Nitrification	N/A	N/A	0	6,720	N/A
Burbank Water Reclamation Plant (BWRP)[1,4]	City of Burbank Department of Public Works	Tertiary to Title 22 Standards with Nitrification/ De-nitrification	11,200	8,960	0	8,960	N/A
Tapia Water Reclamation Facility (TWRF)[1,4]	LVMWD	Tertiary to Title 22 Standards with Nitrification/ De-nitrification	17,920	8,960	0	8,960	N/A
Joint Water Pollution Control Plant (JWPCP)[1,4]	Sanitation District of Los Angeles County	Secondary[7]	448,000	313,600	0	0	313,600

1. Sources: DCTWRP, LAG, TIWRP, and HWRP - Department of Public Works - Bureau of Sanitation Recycled Water Table FY 2014/15; ECLWRF and Carson Facility – West Basin staff; BWRP - Burbank Water and Power Staff; TWRF Las Virgenes Municipal Water District staff; Joint WPCP – LACSD Website
2. In FY 14/15 1,700 AF of recycled water was delivered to City of Glendale from LAGWRP.
3. HWRP delivered 38,300 AF of secondary treated water to ECLWRF for treatment to Title 22 recycled water standards.
4. Recycled water deliveries to LADWP customers from Carson Facility, BWRP, JWPCP and TWRF are pending completion of current water recycling projects.
5. Tertiary treated recycled water from ECLWRF is advanced treated at Carson Facility. Amounts should not be double counted when totaled.
6. Treated wastewater can only be considered recycled if treated to the tertiary level or higher, to meet Title 22 standards.
7. Sanitation Districts of Los Angeles County and the Metropolitan Water District have jointly proposed to increase the treatment level at the JWPCP to meet Title 22 standards, which will create a new source of recycled water.

4.2.1 Recycled Water Facilities within Los Angeles

4.2.1.1 Donald C. Tillman Water Reclamation Plant

In service since 1985, DCTWRP has an average dry-weather flow capacity of 80 million gallons per day (mgd), currently (FY 2014/15) treats approximately 34 mgd of wastewater, and produces 25 mgd of recycled water. The current level of treatment is Title 22 (tertiary) with nitrogen removal (nitrification/de-nitrification (NdN)). DCTWRP provides recycled water for the Japanese Garden, Wildlife Lake, Lake Balboa, treatment plant reuse, and irrigation and industrial uses. All recycled water produced from the facility is used within the LADWP service area. Irrigation uses in the area include golf courses, parks, churches, a high school, and a sports complex. Industrial uses include LADWP's Valley Generating Station. In FY 2014/15 5.6 mgd of tertiary treated wastewater was discharged to the Los Angeles River for operational safety needs. An advanced water purification facility project is being planned that will purify 44 mgd of DCT effluent, producing 35 mgd of advanced treated water to recharge the San Fernando Groundwater Basin via spreading basins. The Groundwater Replenishment project will ultimately recharge up to 30,000 AFY.

4.2.1.2 Los Angeles-Glendale Water Reclamation Plant

LAGWRP is a joint project of the City of Los Angeles and City of Glendale. LAGWRP began treating wastewater in 1976. Its average dry-weather flow capacity is 20 mgd, currently (FY 2014/15) treats approximately 14 mgd, and produces 4 mgd of recycled water. Each city is entitled to 50 percent of the plant's capacity. The City of Pasadena purchased rights to 60 percent of Glendale's capacity but has not yet exercised these rights.

The current level of treatment is Title 22 (tertiary) with nitrogen removal (NdN). All of LADWP's portion of the recycled water is used within its service area. Recycled water from the LAGWRP provides landscape irrigation to multiple areas, including, Griffith Park, the Los Angeles Greenbelt Project, Caltrans landscaping, multiple golf courses and parks, and the LA Zoo parking lot. The Los Angeles Greenbelt Project includes Forest Lawn Memorial Park, Mount Sinai Memorial Park, Universal Studios, and the Lakeside Golf Course. The City of Glendale is entitled to half of the recycled water produced at the plant and serves a number of customers in their service area as discussed in their UWMP. As with the DCTWRP, in FY 2014/15 9.6 mgd of tertiary-treated water from LAGWRP was discharged into the Los Angeles River for operational safety needs.

4.2.1.3 Terminal Island Water Reclamation Plant

Originally built in 1935, TIWRP has been providing secondary treatment since the 1970s. Tertiary treatment systems were added in 1996. TIWRP has an average dry-weather flow capacity of 30 mgd. The plant's Advanced Water Treatment Facility adds MF/RO treatment to a portion of the treated effluent producing 4 mgd of recycled water in 2014/15. Recycled water is supplied to two users within the service area, the Water Replenishment District for the Dominguez Gap Seawater Intrusion Barrier to reduce seawater intrusion into drinking water aquifers, and to LADWP's Harbor Generating Station for landscape irrigation. The remaining TIWRP effluent is discharged to the Los Angeles Harbor. In FY 2014/15 approximately 10 mgd of treated wastewater was discharged. Future recycled water production is expected to increase the supply available to the Dominguez Gap Seawater Intrusion Barrier along with other potential customers in the Harbor Area.

4.2.1.4 Hyperion Water Reclamation Plant

Operating since 1894, HWRP is the oldest and largest of the City's wastewater treatment plants. Its $1.2 billion construction upgrade, completed in 1999, allows for full secondary treatment. The average dry-weather flow capacity of HWRP is 450 mgd, with an average FY 2014/15 wastewater flow of 263 mgd. A majority of the treated water is discharged through a 5-mile outfall into the Santa Monica Bay. The remainder, approximately 45 mgd in FY 2014/15, was used at HWRP or was sold to WBMWD for treatment at the ECLWRF to meet recycled water demands in the WBMWD service area and in parts of the City of Los Angeles.

4.2.2 Recycled Water Facilities outside Los Angeles Which Serve the City

4.2.2.1 Edward C. Little Water Recycling Facility – West Basin Municipal Water District

Recycled water to meet specific end users requirements is produced at the ECLWRF operated by WBMWD. In FY 2014/15, 35 mgd of secondary treated water was purchased from HWRP and treated to recycled water standards. WBMWD's water purchase agreement with the City does not limit the volume of water that may be purchased from HWRP and is not expected to contain a limit when it is renegotiated in 2016. WBMWD's ability to purchase water is limited by their pumping capacity. The pump station has a firm capacity of 50 mgd and total capacity of 70 mgd. The pump station is being expanded to a firm capacity of 83 mgd and a total capacity of 98 mgd. Dependent upon the end use of the recycled water, treatment processes include tertiary treatment, RO, MF/RO, and MF with double-pass RO. On average over the period FY 2010/11 – FY 2014/15 the facility produced 43 mgd of product water. A portion of this water is purchased by LADWP to serve customers in West Los Angeles, and the balance is used to meet recycled water demands in WBMWD's service area. In FY 2014/15 approximately 900 AF was purchased and distributed in the LADWP service area. Customers in West Los Angeles include Loyola Marymount University, Playa Vista, multiple parks, street medians, LADWP's Scattergood Generating Station, and irrigation at Los Angeles International Airport. Recycled water is also supplied to the Water Replenishment District for injection into the West Coast Groundwater Barrier to reduce seawater intrusion.

An additional portion of the flows are routed to WBMWD's Carson Facility for further treatment to meet end-user requirements.

4.2.3 City of Los Angeles Actual and Projected Wastewater Volume

Average dry-weather wastewater influent projections for the City's wastewater treatment plants are expected to increase by approximately 20 percent over the next 25 years. Projections include flows from 29 agencies outside of the City with contracts for wastewater treatment. Wastewater effluent that is not recycled is discharged to either the Pacific Ocean via the Los Angeles River, or to outfalls leading directly to the Pacific Ocean. Wastewater treatment projections of average dry-weather flows through 2040, and associated disposal methods, are provided in Exhibit 4D.

Exhibit 4D
City of Los Angeles Wastewater Treatment Plants Average Dry-Weather Flows, Reuse and Discharge Method

Wastewater Treatment Plants	Reuse and Discharge Method	Actual FY 14/15	Average Dry Weather Flow Projections (AFY)				
			FY 19/20	FY 24/25	FY 29/30	FY 34/35	FY 39/40
Donald C. Tillman Water Reclamation Plant (DCTWRP)	Recycling and Pacific Ocean via Los Angeles River	38,000	54,000	74,000	76,000	79,000	81,000
Los Angeles - Glendale Water Reclamation Plant (LAGWRP)	Recycling and Pacific Ocean via Los Angeles River	16,000	33,000	21,000	21,000	21,000	21,000
Terminal Island Water Reclamation Plant (TIWRP)	Recycling and Pacific Ocean via Outfall in Los Angeles Harbor	18,000	15,000	23,000	24,000	24,000	24,000
Hyperion Water Reclamation Plant (HWRP)	Conveyance to ECLWRF for Recycling and Pacific Ocean Outfall	294,000	287,000	361,000	377,000	393,000	410,000
	Total	366,000	389,000	479,000	498,000	517,000	536,000

Source: Los Angeles Department of Public Works - Bureau of Sanitation

4.3 Existing Recycled Water Deliveries

The City has several recycled water projects currently providing recycled water for landscape irrigation, industrial, and commercial uses spread throughout the following four service areas:

- Harbor – located in the southern portion of the City and currently served by TIWRP.
- Central City (Metro) – located in the central/eastern portion of the City and served by LAGWRP.
- San Fernando Valley – located in the northern portion of the City and served by DCTWRP.
- Westside – located in the central/western portion of the City and served by HWRP through the WBMWD's ECLWRF.

Locations of the service areas are depicted in Exhibits 4G, 4I, 4K and 4M provided with the discussion of each service area. Recycled water service areas coincide with potable water service areas. Recycled water produced for FY 2014/15 was 36,738 AFY, inclusive of municipal and industrial, and environmental reuse, as summarized in Exhibit 4E. The highest use was for environmental uses at 26,317 AF followed by irrigation at 5,379 AF.

Exhibit 4E
Recycled Water Use FY 2014/15 by Service Area

Recycled Water Service Area	Existing Annual Demand (AFY)
Irrigation	
Harbor Area	1
Metro Area	2,432
Valley Area	2,052
Westside Area	894
Subtotal Irrigation	5,379
Industrial	
Valley Area	596
Subtotal Industrial	596
Dust Control	
Metro Area	14
Subtotal Dust Control	14
Environmental	
Valley Area	26,317
Subtotal Environmental	26,317
Seawater Barrier	
Harbor Area	4,432
Subtotal Seawater Barrier	4,432
Total	36,738

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

4.3.1 Harbor Area

Recycled water in the Los Angeles Harbor Area is currently produced at the Advanced Water Treatment Facility (AWTF) located at the TIWRP. The AWTF began operating in 2002 with first deliveries to the Dominguez Gap Seawater Barrier in 2006. This project was developed jointly by LADWP, LASAN, and BOE. Operation and maintenance is provided by LASAN with funding from LADWP. Recycled water, treated using microfiltration and reverse osmosis, is used for groundwater injection with FY 2014/15 demands of 4,432 AFY. Two meters to receive recycled water were installed at the LADWP Harbor Generating Station and are supplying recycled water for irrigation. Treatment capacity of the AWTF is approximately 5,600 AFY. Excess recycled water is discharged into the Los Angeles Harbor. Exhibit 4F summarizes estimated annual demands in the Harbor Area based on FY 2014/15. Exhibit 4G depicts the service area, existing users, potential users, and the location of the AWTF at TIWRP.

Water Replenishment District

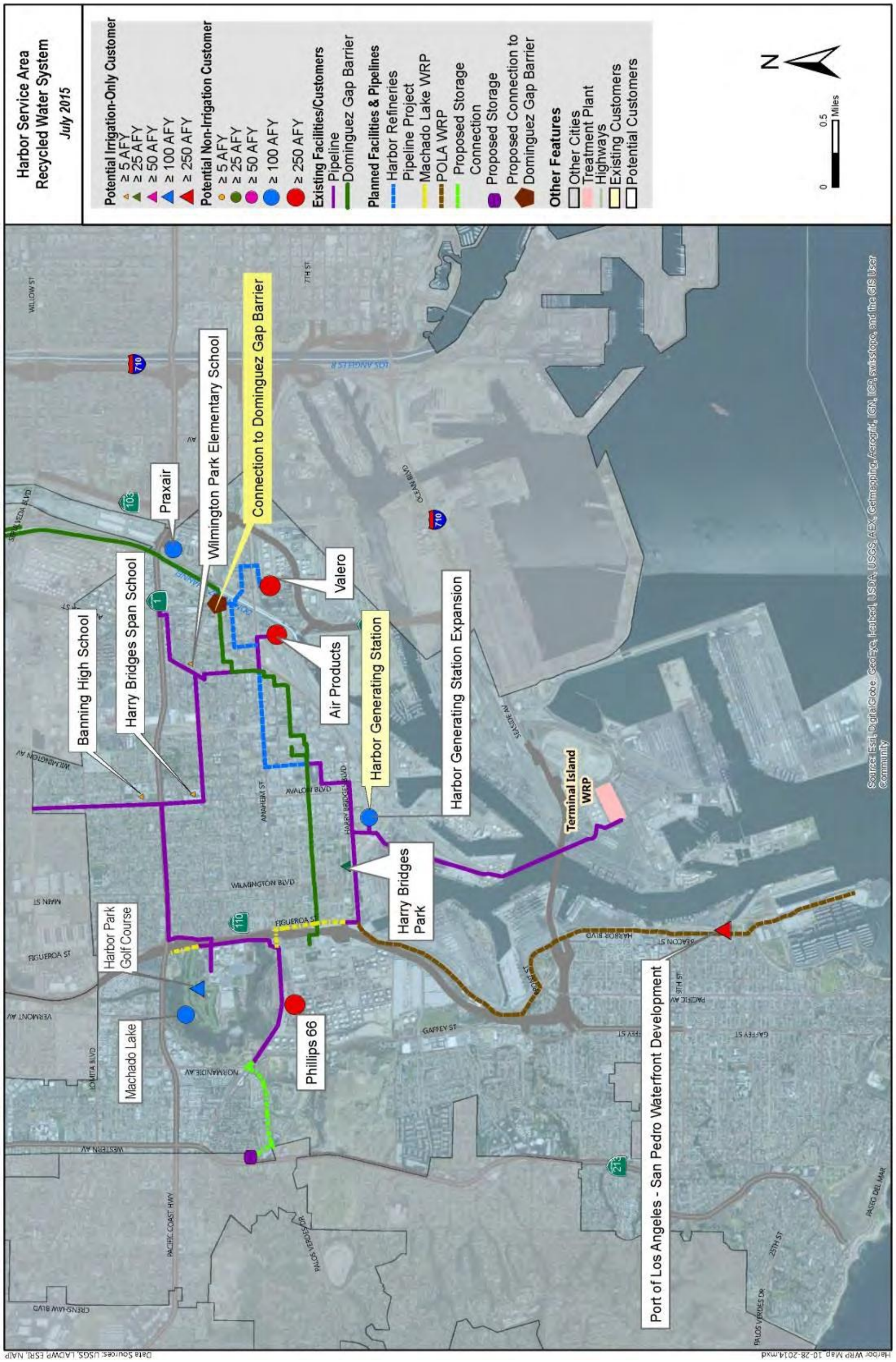
The Water Replenishment District may receive up to 5,000 AFY of recycled water for groundwater injection for the Dominguez Gap Seawater Intrusion Barrier. A blend of fifty percent recycled water and fifty percent imported water is injected into the barrier to protect the West Coast Groundwater Basin from seawater intrusion. In April 2016, recycled water supply is expected to increase to 6,000 AFY upon completion of a 10,000-gallon surge tank at TIWRP. Upon completion of the TIWRP expansion in April 2017, we are anticipating increasing supply to the GAP to 7,500 AFY.

Exhibit 4F
Harbor Recycled Water Existing FY 2014/15 Annual Demand

Project	Existing Annual Demand (AFY)
Irrigation	
Harbor Generating Station	1
Irrigation Subtotal	1
Seawater Barrier	
Dominguez Gap Barrier (Water Replenishment District)	4,432
Seawater Barrier Subtotal	4,432
Total Harbor Water Recycling Projects	4,433

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

Exhibit 4G
Harbor Recycled Water Service Area



4.3.2 Metro Area

The Metro Recycled Water System has supplied the Metro Service Area with recycled water produced at LAGWRP to irrigation customers since 1979. LAGWRP provides recycled water treated to a tertiary level meeting Title 22 standards with nitrogen removal. As previously stated, recycled water produced at LAGWRP is equally split between the cities of Los Angeles and Glendale. Griffith Park was the City's first recycled water project. In 1992 the Greenbelt project was the City's first recycled water project providing water to non-government entities. Recycled water service was established in the Taylor Yard area beginning in 2009 with service to Rio de Los Angeles State Park. Current recycled water demands (FY 2014/15) for the Metro Recycled Water System service area are 2,446 AFY. Almost all recycled water use in the Metro Service Area is used for irrigation with a small amount used for dust suppression at the Headworks Construction Project which is expected to continue through FY 2017/18. As of the end of FY 2014/15 there were 16 water recycling customers online. Between 2009 and May 2015, eleven (11) additional projects were completed. One additional project, the Los Feliz Golf Course began recycled water service in May 2014 with negligible water use during FY 2014/15. Any unused recycled water is discharged to the Los Angeles River. Exhibit 4H summarizes current demands on the Metro Recycled Water System. Exhibit 4I depicts the service area, existing users, potential users, and LAGWRP.

Exhibit 4H
Metro Recycled Water FY 2014/15 Annual Demand

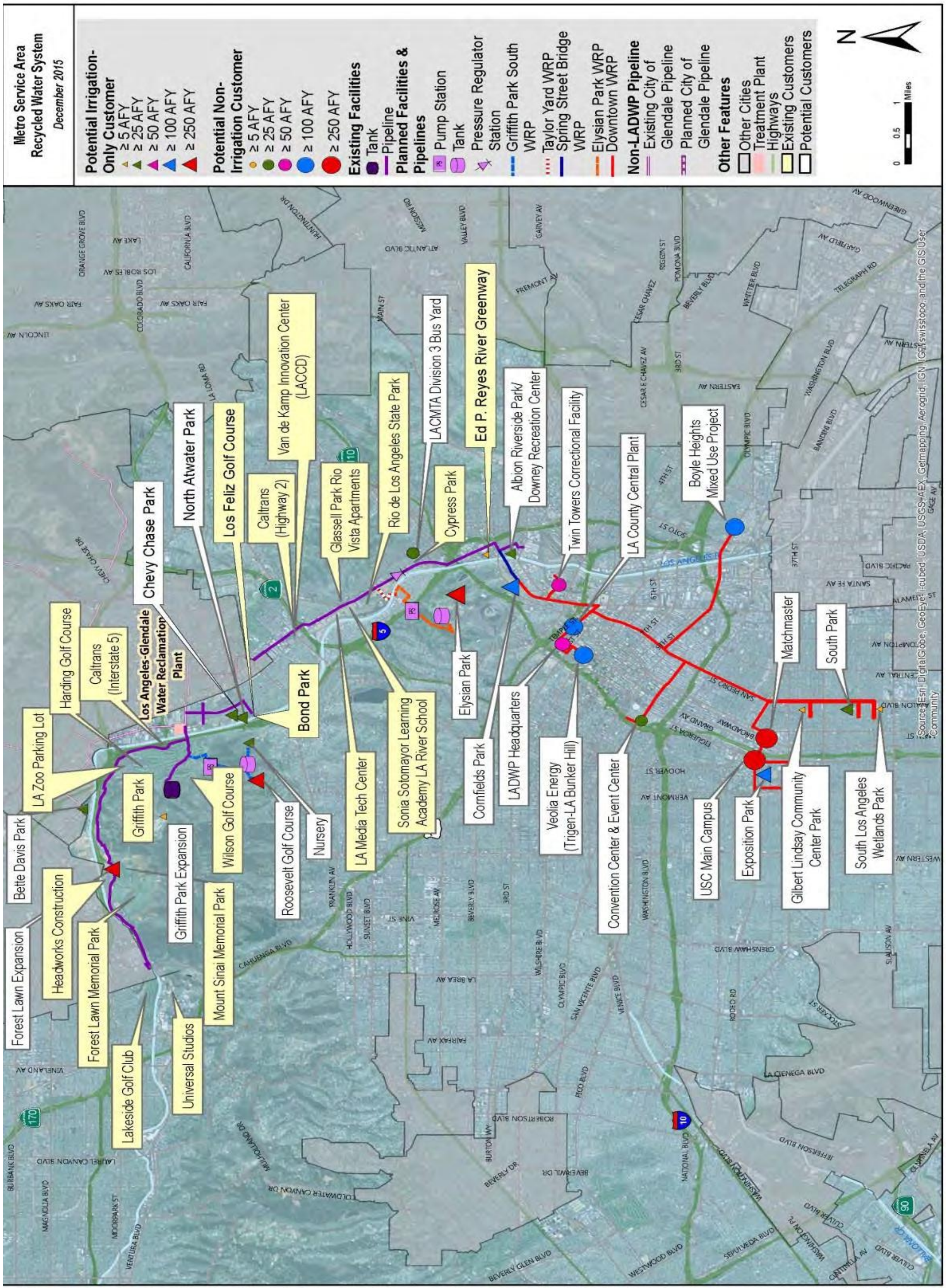
Project	Existing Annual Demand (AFY)
Irrigation	
Caltrans (Interstate 5)[1]	0
Forest Lawn Memorial Park	658
Bond Park	1
Griffith Park	296
Harding and Wilson Golf Courses	565
Lakeside Golf Club	362
Mount Sinai Memorial Park	270
Universal Studios	175
Cypress Park	5
LA Zoo Parking Lot	13
Glassel Park Rio Vista Apartments	1
Rio de Los Angeles State Park	42
LA Media Center	15
Sonia Sotomayor Learning Academy LA River School	12
Caltrans (Highway 2)	2
Van de Kamp Innovation Center	2
Ed P. Reyes River Greenway	1
Los Feliz Golf Course	12
Subtotal Irrigation	2,432
Dust Control	
LADWP Headworks Construction[2]	14
Subtotal Dust Control	14
Total Metro Water Recycling Projects	2,446

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

[1] Undetermined amount of use.

[2] Water is used for dust suppression during construction. Water is expected to be used through FY 17/18.

Exhibit 4I
Metro Recycled Water Service Area



Data Sources: USGS, LADWP, ESRI NAIP

Metro WRP Map.mxd

4.3.3 San Fernando Valley Area

The Valley Recycled Water System receives water from DCTWRP to satisfy irrigation, environmental, and industrial demands. Recycled water is treated to a tertiary level meeting Title 22 standards with nitrogen removal. FY 2014/15 estimated recycled water demands for the San Fernando Valley Area are 28,965 AFY. Recycled water produced in excess of demand is discharged to the Pacific Ocean via the Los Angeles River. Exhibit 4J summarizes FY 2014/15 demands for the Valley Recycled Water System. The East Valley trunkline, a 54-inch-diameter pipeline, was previously constructed to replenish the San Fernando Basin with recycled water. It is now the backbone of the Valley Recycled Water System's distribution system to deliver water throughout the San Fernando Valley for irrigation, commercial, and industrial use. As of FY 2014-15, fifteen customers are served by the Valley Recycled Water System, excluding DCTWRP in-plant use, and environmental uses. Exhibit 4J summarizes current demands for Valley Recycled Water System. Exhibit 4K depicts the service area, existing users, potential users, and DCTWRP.

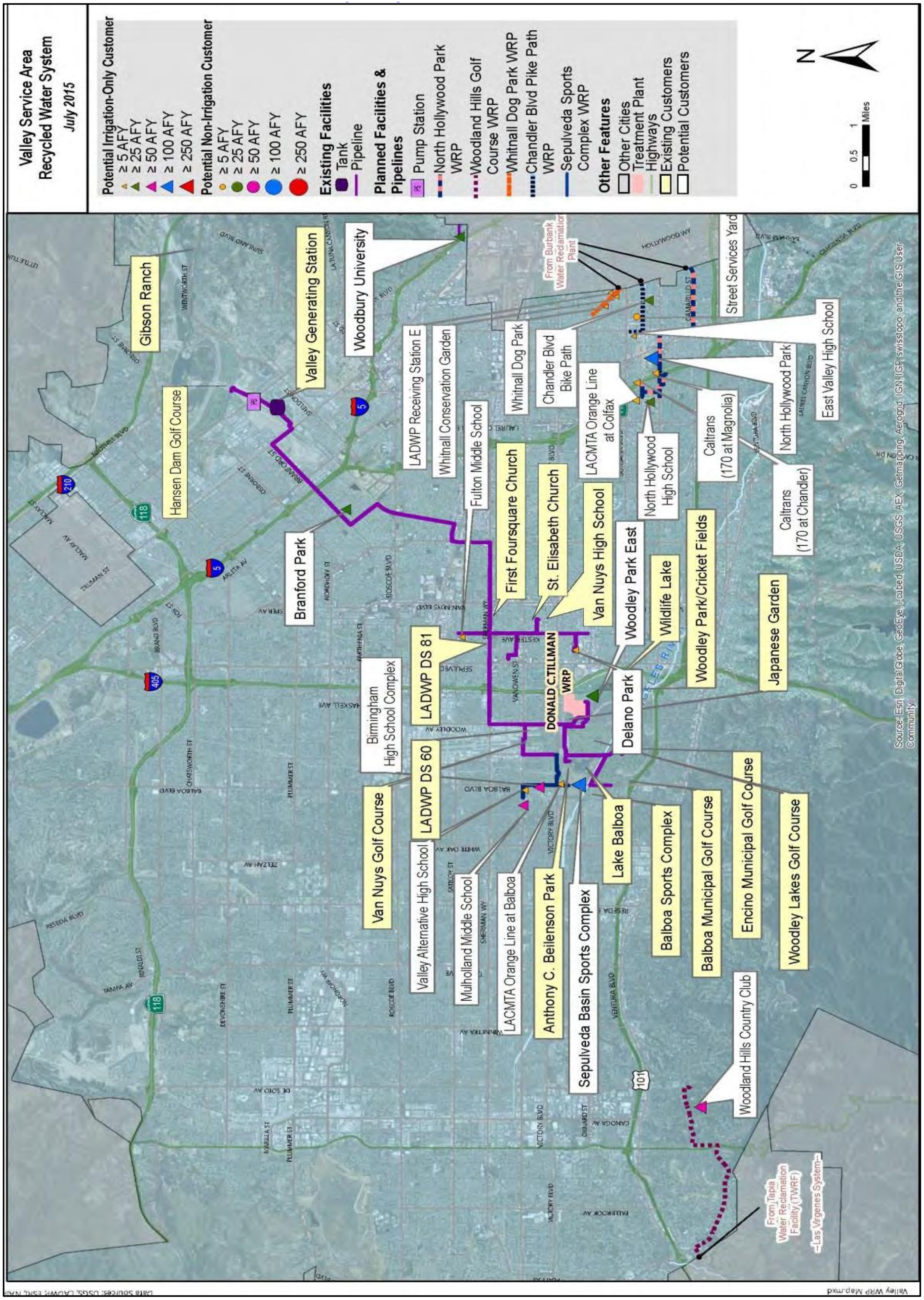
Exhibit 4J
Valley Recycled Water FY 2014/15 Annual Demand

Project	Existing Annual Demand (AFY)
Irrigation	
Balboa Municipal Golf Course	301
Encino Municipal Golf Course	305
Woodley Lakes Municipal Golf Course	677
St. Elisabeth Church	1
Balboa Sports Complex	130
Van Nuys Golf Course	174
Van Nuys High School	25
First Foursquare Church	9
Anthony C. Beilenson Park	99
LADWP Distribution Station 60[1]	0.1
Woodley Park/Cricket Fields	99
LADWP Distribution Station 81[1]	0.3
Gibson Ranch[2]	2
Hansen Dam Golf Course	230
Subtotal Irrigation	2,052
Industrial	
Valley Generating Station	596
Subtotal Industrial	596
Environmental Use	
Japanese Garden	4,531
Wildlife Lake	5,140
Lake Balboa	16,646
Subtotal Environmental Use	26,317
Total Valley Water Recycling Projects	28,965

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

1. Irrigation and equipment wash.   2. Dust control and irrigation.

Exhibit 4K
Valley Recycled Water Service Area



Irrigation

Recycled water from DCTWRP is used at 14 locations, including Hansen Dam Golf Course connected in 2015. Irrigation users include golf courses, park, churches, schools, sports fields, a ranch, and LADWP electrical distribution stations. LADWP Distribution stations 60 and 81 both use water for irrigation purposes and equipment washing. FY 2014/15 irrigation demands in the Valley were 2,051 AFY.

Industrial

Recycled water is used for industrial purposes at LADWP's Valley Generating Station and DCTWRP for in-plant purposes. FY 2014/15 industrial demands were 3,827 AFY. Recycled water service began in 2008 at the Valley Generating Station and demands in FY 2014/15 were approximately 596 AFY. Recycled water is used in a cooling tower for one of the generation units at the Valley Generating Station. Recycled water at DCTWRP is used for in-plant purposes. DCTWRP demands vary from year to year based on actual needs. DCTWRP in plant re-use is estimated at 3,231 AFY for FY 2014/15.

Environmental Use

Recycled water from DCTWRP has provided environmental benefits since 1984, commencing with deliveries to the Japanese Garden and followed by deliveries to Lake Balboa in 1990 and wildlife lake in 1991. For planning purposes demands are estimated at 26,600 AFY with actual deliveries varying year to year. In FY 2014/15 deliveries were estimated at 26,317 AFY based on historical data. Overflows from the lakes and the garden are discharged to the Los Angeles River in conjunction with variable and intermittent direct discharges from DCTWRP for operational safety.

Japanese Garden

The 6.5-acre Japanese Garden is located at the Sepulveda Dam Recreation Area. The Japanese Garden receives more than 10,000 visitors per year. Historically, DCTWRP provides approximately 4,000 AFY of recycled water for the lake and landscaping at the Japanese Garden.

Wildlife Lake

Located in the Sepulveda Basin Wildlife Reserve, the wildlife lake uses approximately 5,600 AFY of recycled water from DCTWRP for wildlife habitat management.

Lake Balboa

Lake Balboa is the centerpiece of the Sepulveda Dam Recreation Area and is a popular recreational facility located in Anthony C. Beilenson Park. Approximately 17,000 AFY of recycled water is provided for this lake from DCTWRP.

Japanese Gardens are supplied with 4,000 AF of recycled water annually

4.3.4 Westside Area

Recycled water supplied to the Westside Recycled Water System is provided by WBMWD via the ECLWRF, located in the City of El Segundo, for irrigation and commercial (toilet flushing) demands. The ECLWRF can treat up to 62.3 mgd of secondary-treated effluent received from HWRP to a tertiary level meeting Title 22 standards. A portion of the water, based on customer needs, undergoes advanced treatment using RO, MF/RO, and double-pass RO. Under an agreement between WBMWD and the City, WBMWD purchases secondary-treated effluent from HWRP, and LADWP has a right to purchase up to 25,000 AFY of recycled water from the ECLWRF. Approximately 38,300 AF of secondary-treated effluent was purchased from HWRP in FY 2014/15. Recycled water not purchased by LADWP is sold to users within WBMWD's service area.

Deliveries of recycled water from the Westside Recycled Water System first began in 1996. To increase the use of recycled water in West Los Angeles, LADWP has constructed more than five miles of distribution trunk lines to serve the Westchester, Los Angeles International Airport, and Playa Vista development areas. Recycled water demands in the Westside during FY 2014/15 were 894 AF as shown in Exhibit 4L. Exhibit 4M depicts the service area, existing users, potential users, and ECLWRP and HWRP.

Recycled water from ECLWRF is used at 10 locations to meet irrigation demands. Irrigation users include a golf course, parks, street medians, Los Angeles International Airport, LADWP Scattergood Generating Station, Loyola Marymount University, the Parking Spot, HWRP, and various users in Playa Vista. Recycled water is also used at HWRP and Playa Vista Phase 1 to flush toilets in dual plumbed commercial facilities. Playa Vista is the first planned development in the City to use recycled water for the irrigation of all of its landscaping and for residential outdoor use. This project began receiving recycled water in 2009. Recycled water is required for outdoor use under the development's mitigation requirements established during the environmental review process. Connections to the Playa Vista Development Phase 2 began in 2014 and will continue in the near future. Between 2009 and May 2015, four (4) additional projects were completed.

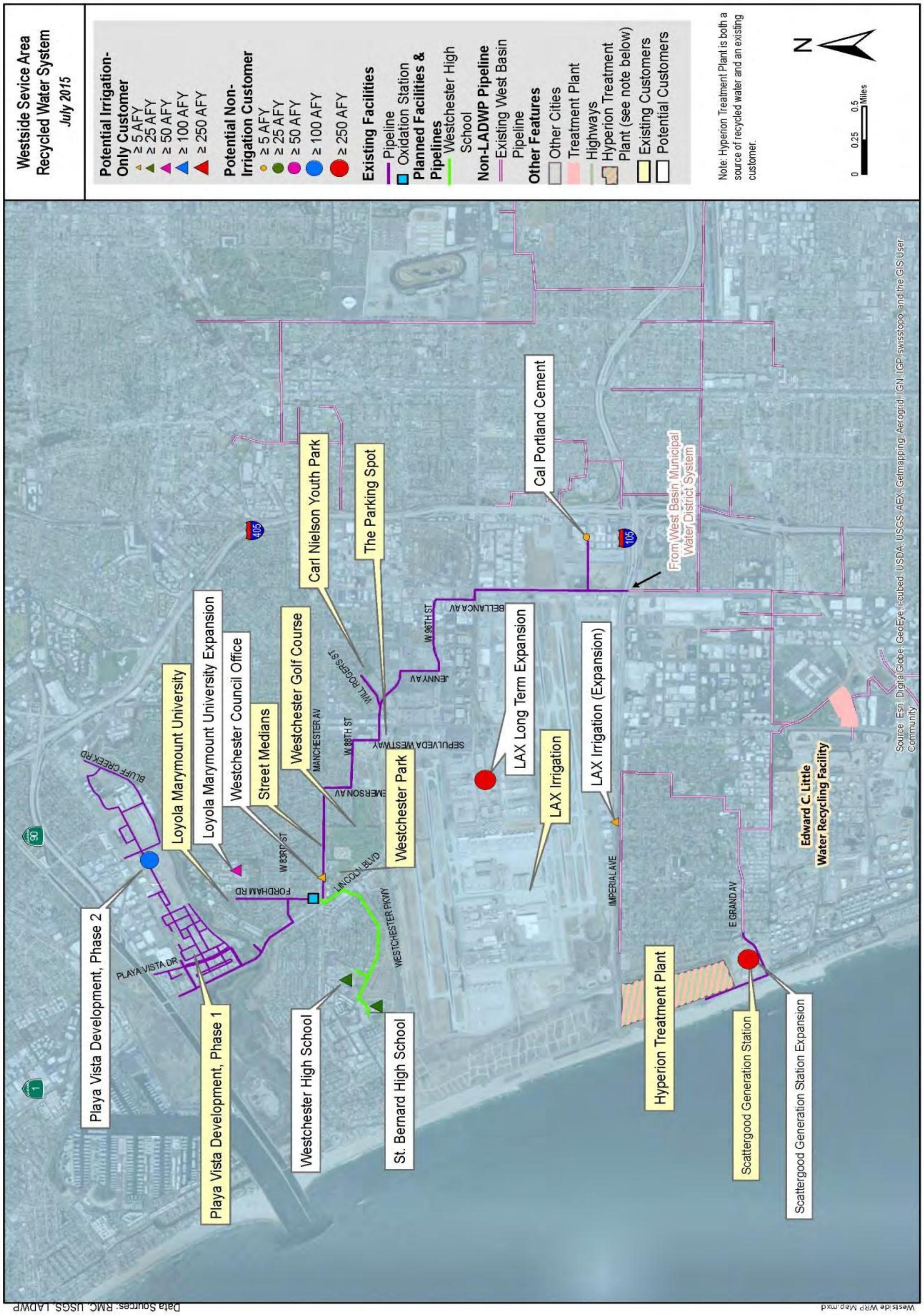
Exhibit 4L
Westside Recycled Water FY 2014/15 Annual Demand

Project	Existing Annual Demand (AFY)
Irrigation	
LADWP Scattergood Generating Station	0.4
Los Angeles International Airport Irrigation	165
Loyola Marymount University	146
Carl Neilsen Youth Park	16
Street Medians	46
The Parking Spot	1
Westchester Park	30
Playa Vista Development, Phase 1[1]	239
Playa Vista Development, Phase 2	13
Westchester Golf Course	185
Hyperion Water Reclamation Plant[1]	53
Subtotal Irrigation	894
Total Westside Water Recycling Projects	894

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

1. Irrigation and toilet flushing.

Exhibit 4M
Westside Recycled Water Service Area



4.3.5 Comparison of 2010 Projections Versus Actual Use

LADWP has made progress in increasing recycled water use in the interim period between completion of the 2010 and 2015 UWMPs. Between 2009 and May 2015, over 26 additional projects have come online. Municipal and industrial recycled water use between FY 2010/11 and FY 2014/15 increased from 7,894AFY to 10,421 AFY. The 2010 UWMP projected municipal and industrial recycled water use in FY 2014/15 to be approximately 20,000 AF; however, actual use was lower than projected, as shown in Exhibit 4N. Environmental use of recycled water fluctuates slightly year to year based on lake levels, but has historically averaged 26,600 AFY. For FY 2014/15 actual environmental use was 26,317 AF. Overall total recycled water used in FY 2014/15 was 36,738 AFY.

Although LADWP did not meet the 2010 UWMP recycled water projection for FY 2014/15, progress has been made, including the completion of over 26 additional projects. Other projects proposed for construction in the near future, including up to 30,000 AFY of groundwater replenishment, are described in Section 4.4, Recycled Water Planning Efforts. These projects are expected to increase recycled water use to 59,000 AFY by the end of FY 2024/25.

4.4 Recycled Water Planning Efforts

With the current drought and City initiatives to reduce imported potable reuse, recycled water planning efforts have rapidly accelerated. LADWP, in partnership with LASAN and BOE, completed a Recycled Water Master Planning documents (RWMP) in 2012 to provide guidance and identify future recycled water efforts. The RWMP was a multi-year effort initiated in 2009. A major purpose of the document was to develop plans for achieving and exceeding the recycled water targets for 2035 of 59,000 AFY established in the 2010 UWMP. The document serves as guidance for development of future recycled water projects. Two major strategies developed included:

- Development of a groundwater basin replenishment program using indirect potable water reuse; and
- Expansion of the existing non-potable reuse systems.

Exhibit 4N
2010 UWMP Recycled Water Projections for FY 2014/15 versus Actual Use

Programs	2014-15 Actual Use (AFY)	2014-15 Projected in 2010 UWMP (AFY)
Municipal and Industrial Uses[1]	5,989	20,000
Environmental Use[2]	26,317[3]	26,990
Seawater Intrusion Barrier (Dominguez Gap)[1]	4,432	3,000
Total	36,738	49,990

1. LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx. Does not include deliveries of 38,300 AFY to ELCWRF.
2. Historical water use averages 26,600 AFY and is ultimately discharged to the Los Angeles River.
3. LASAN, FY 2014-15 Recycled Water Table.

- Development of the RWMP involved extensive public input including establishment of a Recycled Water Advisory Group (RWAG) that continues to meet today. Furthermore, at the request of the City the National Water Research Institute established an Independent Advisory Panel to provide third party review of the City's Groundwater Replenishment (GWR) project as it progresses.

The RWMP recommended locations where the recycled water system could be effectively expanded. A cost benefit analysis was conducted to identify projects and potential customers based on location and projected use. A review of the wastewater treatment plants was performed to determine how much recycled water can be supplied. The RWMP reviewed available options for maximizing reuse through a combination of alternatives including expansion of non-potable irrigation/industrial uses and groundwater replenishment (indirect potable reuse).

In the interim period since completion of the RWMP, ED5 was issued by Mayor Garcetti in 2014 and the pLAn was completed in 2015, which established goals of reducing purchased imported potable water use by 50 percent by 2025 and increasing local water source to 50 percent by 2035. LADWP is working towards meeting this goal through multiple options, including an increase in recycled water use. The pLAn established the following goals as they relate to recycled water:

- Expand recycled water by an additional 6 mgd by 2017 at TIWRP;

- Convert 85% of public golf courses to recycled water;

- Develop a strategy to convert the City's lakes to recycled water and implement a pilot project; and

- Expand recycled water production, treatment, and distribution to incorporate indirect potable reuse and direct potable reuse.

While the RWMP continues to provide important guidance as LADWP moves forward to meet the goals of ED 5 and pLAn, the RWMP project planning timeframes and options have been surpassed with these new initiatives.

Recycled water projections in five year increments beginning in FY 2019/20 through 2039/40 (projection period) are presented in Exhibit 4O. These projections outline the recycled water use categories LADWP plans to increase to meet the goals established in ED5 and pLAn. LADWP recycled water use is projected to reach 59,000 AFY by FY 2024/25 by adding 19,000 AFY of planned municipal/industrial use and 30,000 AFY of indirect potable reuse (groundwater replenishment), and further increase to 75,400 AFY through the remainder of the projection period by adding another 16,000 AFY of potential customer growth. Environmental reuse is expected to remain constant at 26,740 AFY.

Exhibit 4O
Recycled Water Use Projections

Category	Project Use (AFY)				
	FY 19/20	FY 24/25	FY 29/30	FY 34/35	FY 39/40
Municipal and Industrial Uses[1]	19,800	29,000	39,000	42,200	45,400
Indirect Potable Reuse (Groundwater Replenishment)	0	30,000	30,000	30,000	30,000
Subtotal	19,800	59,000	69,000	72,200	75,400
Environmental Use[2]	26,740	26,740	26,740	26,740	26,740
Total	46,540	85,740	95,740	98,940	102,140

1. LADWP Recycled Water Group, UWMP 2015 Recycled Water Projections 2015.08.29.xlsx. Does not include projected deliveries to ELCWRF.
2. Historical water use has been 26,600 for environmental uses associated with DCTWRP. Actual yearly use will fluctuate based on conditions. 26,600 AFY is used for future planning purposes for environmental uses associated with DCTWRP plus 140 AFY for Machado Lake. Water associated with DCTWRP environmental uses is ultimately discharged to the Los Angeles River.

Exhibit 4P
Near-Term Estimated Demands by Recycled Water Service Area

Recycled Water Area	Estimated Additional Annual Demand (AFY)
Harbor Area	12,820
Metro Area	3,693
Valley Area	963
Westside Area	1,396
Total	18,872

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

Estimates of projected use and implementation timelines in the tables above, as well as the annual demands and service dates for individual customers in the following sections, may be affected by varying usage patterns of potential customers, timelines to reach agreements, potential financial constraints, and changing regulatory requirements.

4.4.1 Near-Term Projects through FY 2024/25

"Near-Term" projects are classified as projects that will result in new recycled water demands between July 1, 2014 and June 30, 2025 to assist in achieving total recycled water use of 59,000 AFY by FY2024/25. Near-Term projects are either in the planning, design, or construction stage. Near-Term projects target customers that have already been identified as potential recycled water users, exclusive of the GWR project. Estimated additional demands associated with the Near-Term projects are 18,872 AFY. Exhibit 4P summarizes Near-Term demands by recycled water service area.

Project Selection

Criteria for selecting Near-Term projects were established as part of the RWMP. Irrigation-only customers were focused on first as they are generally easier to convert to recycled water use than commercial or industrial users. As described below, recycled water project options were developed to meet the goal of maximizing recycled water use, while promoting cost efficiency, feasibility, and adaptability. Three primary steps were utilized to develop recycled water project options:

- Identification of preliminary project options to serve customers with non-potable demands in excess of 50 AFY or in high density demand clusters with non-potable demands in excess of 50 AFY per square mile.
- Define facilities including transmission pipeline (backbone alignments) and laterals based on hydraulic modeling and define cost estimates based on these facilities.
- Screen the list of preliminary project options by unit cost.

Recycled Water Supply Sources

Recycled water availability varies by service area. Additional supplies may be required to meet expected demands requiring a combination of existing facilities expansion, service connections to neighboring agencies outside the City, new facilities, and satellite treatment plants. LADWP expects to receive additional recycled water supplies available in the Valley and Harbor service areas via LVMWD's TWRF, City of Burbank Department of Public Works' BWRP, and WBMWD's Carson Facility. As part of the RWMP process, LADWP met with neighboring agencies in 2009 to explore potential opportunities for regional development of recycled water reuse facilities. These agencies are listed in Exhibit 4U, in section 4.4.5, Stakeholder Process and Agency Coordination.

Harbor Area

LADWP is currently expanding recycled water infrastructure in the Harbor Area to serve large industrial and irrigation customers, and provide environmental benefits at Machado Lake. Twelve projects are planned to increase recycled water usage by an additional 12,820 AFY by FY 2022/23. Approximately 140 AFY of recycled water is proposed for environmental uses at Machado Lake beginning in 2017 to stabilize lake levels. Lake levels are currently supplemented with potable water. An expansion of the AWTF at TIWRP is currently under construction to partially meet projected demands in the Harbor Area. Exhibit 4Q summarizes Near-Term projects, additional demands, estimated service dates, and the current status of projects in the Harbor Area.

LADWP and LASAN are currently exploring concepts to treat and deliver additional recycled water to the Harbor Area to meet projected demands. Potential sources of recycled water are HWRP, Carson Water Reclamation Facility, and the Joint Water Pollution Control Plant, shown in Exhibit 4A. Potential additional customers in the Harbor Area include Phillips 66, Tesoro, Harbor Cogen, Warren E/P, and Harbor College.

Exhibit 4Q
Harbor Area Near-Term Estimated Demands

Project Type	Estimated Annual Demand (AFY)	Estimated Service Date	Phase
Seawater Intrusion Barrier (Dominguez Gap) Expansion 1st Increase	1,000	2016	Permitting
Harbor Water Recycling Project AWTF Phase II Expansion	Provides treatment capacity expansion	2017	Construction
Seawater Intrusion Barrier (Dominguez Gap) Expansion 2nd Increase	1,500	2017	Design
Harbor Industrial Onsite Improvements	2,360	2017	Planning
Harbor Refineries Pipeline Project	1,000	2017	Construction
Machado Lake Pipeline Project	340	2017	Bid and Award
Roosevelt Memorial Park Water Recycling Project	90	2016	Construction
San Pedro Waterfront Port of LA	100	2022	Planning
Port of LA Wilmington Waterfront Water Recycling Project	140	2016	Complete
Harbor Recycled Water Tank	50	2022	Planning
West Basin Carson RW Pipeline or Alternative[1]	6,100	2023	Design
Machado Lake	140	2017	Bid and Award
Total	12,820		

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

1. Reach full capacity of 11,100 AFY by 2027

Metro Area

Seven water recycling projects and three customer connections are planned in the Metro Area to add annual demands of approximately 3,705 AFY. Almost all recycled water use is proposed for irrigation. LAGWRP will continue to meet all recycled water demands in the Metro Area. Exhibit 4R summarizes Near-Term demands for the Metro Area.

Exhibit 4R
Metro Area Near-Term Estimated Demands

Project Type	Estimated Annual Demand (AFY)	Estimated Service Date	Phase as of July 20, 2015
Griffith Park Area Expansions	8	2017	Construction
Chevy Chase Park	10	2015	Customer Connection
Bette Davis Park Water Recycling Project	35	2015	Construction
LACTMA Division 3 Bus Yard	30	2017	Customer Connection
Elysian Park Tank & Pump Station WRP	400	2019	Planning
Forest Lawn Memorial Park Expansion	500	2022	Planning
Downtown WRP	2,350	2021	Planning
Griffith Park South WRP	310	2017	Construction
North Atwater Park	40	2016	Customer Connection
Bond Park	10	2015	Construction
Total	3,693		

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

Hansen Dam Golf Course started irrigating with recycled water in 2015

Valley Area

In the Valley Area DCTWRP, in conjunction with recycled water potentially obtained from BWRP and the Las Virgenes Municipal Water District (LVMWD), will provide recycled water for 6 potential Near-Term projects and three customer connections. The projects and connections are expected to increase recycled water use by an additional 963 AFY by FY 2018/19. All Near-Term use will be for irrigation purposes. These users are all located within close proximity to the existing recycled water system. Exhibit 4S summarizes the potential Near-Term demands for the Valley Area.

LADWP has recently entered into an agreement with Burbank Water and Power to purchase recycled water from the BWRP. Water from this facility is proposed to be used primarily for irrigation.

LADWP is proposing to enter into multiple agreements with LVMWD to obtain recycled from TWRP. Currently, LADWP has identified a potential demand of 1,550 AFY of recycled water that could be served by TWRP. LADWP has completed an agreement with LVMWD for pre-design and environmental compliance for the Woodland Hills Water Recycling Project. An agreement for project design and purchase of recycled water from TWRP is in the early negotiation stage. LADWP will be working with LVMWD to evaluate other potential recycled water projects to use this recycled water.

Exhibit 4S
Valley Area Near-Term Estimated Demands

Project Type	Estimated Annual Demand (AFY)	Estimated Service Date	Phase as of July 20, 2015
Branford Park WRP	20	2016	Construction
Woodley Park/Cricket Fields (ongoing construction)	10	2015	Construction
Sepulveda Basin Sports Complex WRP	308	2017	Phase 1: Construction Phase 2: Planning
Woodland Hills WRP	300	2019	Planning
Delano Park WRP	10	2015	Customer Connection
Fulton Middle School WRP	10	2016	Customer Connection
North Hollywood WRP	285	2017	Construction
Woodbury University	20	2016	Customer Connection
Total	963		

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

Exhibit 4T
Westside Area Near-Term Estimated Demands

Project Type	Estimated Annual Demand (AFY)	Estimated Service Date	Phase
Cal Portland Cement	14	2016	Planning
Hyperion Water Reclamation Plant Phased Expansion	20	2016	Construction
Los Angeles International Airport Irrigation Expansion	18	2016	Design
Playa Vista Phase II (ongoing construction)	43	2017	Customer Connection
Los Angeles World Airports Cooling Towers WRP	1,250	2025	Planning
Westchester Municipal Building	1	2022	Customer Connection
Westchester HS WRP	50	2016	Design
Total	1,396		

Source: LADWP Recycled Water Group, UWMP 2015 Recycled Water Update rev2015.08.29.xlsx

Westside Area

LADWP will continue to acquire recycled water from WBMWD to serve additional Near-Term demands of approximately 1,396 AFY in the Westside Area. Near-Term demands include five projects and two customer connections. Most of the additional recycled water demands are attributed to industrial use at LAX for cooling towers. Exhibit 4T summarizes Near-Term demands for the Westside Area.

Loyola Marymount University, irrigates with recycled water

4.4.2 Groundwater Replenishment

As part of the Recycled Water Master Planning documents (RWMP), the City proposed a Groundwater Replenishment (GWR) Project, also referred to as indirect potable reuse, using highly purified advanced treated recycled water from DCTWRP for spreading in existing spreading basins in the San Fernando Valley area. An Advanced Water Purification Facility (AWPF) is proposed to be constructed to further treat tertiary effluent from DCTWRP to produce highly purified recycled water for recharge. The new AWPF is expected to include microfiltration (MF), reverse-osmosis (RO), and advanced oxidation to recharge up to 30,000 AFY of advanced treated water by 2023/24. Recharge will occur by allowing water to percolate at the existing Hansen Spreading Grounds and the Pacoima Spreading Grounds.

Infrastructure improvements required to implement the GWR Project include the aforementioned AWPF and pipelines to convey product water to the spreading basins. Conveyance pipelines to the Hansen Spreading Grounds are already in place and were constructed as a part of the previous recycled water initiatives for the East Valley Water Recycling Project. However, additional pipeline infrastructure is required to use the Pacoima Spreading Grounds for spreading.

Native stormwater recharge will continue to occur at the spreading grounds in conjunction with the project. Use of the spreading grounds could be potentially restricted for purified recycled water spreading during wet-weather events and spreading of raw imported water. Currently, LADWP and the Los Angeles County Department of Public Works use multiple spreading grounds located in the eastern portion of the San Fernando Basin to recharge the underlying San Fernando Basin with stormwater. A detailed discussion of the San Fernando Basin and existing recharge operations is provided in Chapter 6, Local Groundwater, and Chapter 7 Watershed Management.

Goals for the Advanced Water Purification Facility are:

1. Recharge up to 30,000 AFY by FY 2023/24;

2. Production capacity of 35 mgd;

3. No regulatory limitations on spreading amounts; and,

4. Product water shall comply with requirements from the RWQCB, SWRCB, and be suitable for indirect potable reuse.

Proposed technologies for water purification include microfiltration or ultrafiltration, reverse osmosis, advanced oxidation using ultraviolet light with hydrogen peroxide, and post-treatment for product water stabilization. As a by-product of advanced water treatment, brine is created and must be disposed.

LADWP is working closely with LASAN and regulatory agencies to expedite completion of the project by FY 2023/24. The project is currently in the planning stage. An Environmental Impact Report in compliance with California Environmental Quality Act requirements is being prepared with an anticipated completion date of 2016. This document will describe the alternatives under consideration and develop a recommended alternative for approval. Regulatory requirements for GWR are discussed in sub-section 4.1.2, GWR Regulatory Requirements.

Independent Advisory Panel

GWR projects typically require an independent third party with scientific and technical expertise to provide expert peer review of key aspects of the project. This review can further ensure the technical viability of the GWR project and facilitate the regulatory process. To accomplish this, LADWP awarded a contract to the National Water Research Institute (NWRI) to form an Independent Advisory Panel (IAP) to provide expert peer review of the technical, scientific, regulatory, and policy aspects of the proposed GWR project, pilot project testing, and other potential groundwater replenishment projects to maximize reuse as part of the City's RWMP. The IAP process has provided a consistent, thorough, and transparent review of proposed GWR projects and pilot testing during their critical formation phase, as well as during the long-term implementation phase. Today the IAP continues to provide input on the GWR project and the potential for direct potable reuse.

NWRI has vast experience in the organization and administration of the IAP processes for other agencies such as Orange County Water District's Groundwater Replenishment System. NWRI assists the IAP process by assembling the IAP members, developing a detailed scope and approach for the IAP's review, coordinating and facilitating meetings, and preparing IAP reports.

The "Independent Advisory Panel for the City of Los Angeles Groundwater Replenishment Project" consists of 12 members with scientific and/or professional expertise in issues related to the implementation of groundwater replenishment projects. The selection of members with different areas of expertise was based on the requirements of the California Department of Public Health Draft GWR Reuse Regulations dated August 2008, as well as the composition of panels used by the Orange County Water District and the City of San Diego for the implementation of similar groundwater replenishment projects.

NWRI convened the Independent Advisory Panel for the first time in October 2010 to receive introductory information about the recycled water program and groundwater replenishment project. The Panel is expected to be involved throughout the planning, permitting, design, environmental documentation, and implementation of the groundwater replenishment project.

Some of the activities addressed by the IAP have included, but are not limited to review of the following:

- General approach for Recycled Water Master Planning;
- Hydrogeology (in-basin groundwater blending);
- Treatment (barriers to replace the fifty-percent blend criteria);
- Reliability features of the Advanced Water Purification Facilities;
- Source Control Evaluation for GWR;
- Draft Engineering Report for GWR; and
- Response to technical concerns raised by regulators and the public.

4.4.3 Long-term Recycled Water Conceptual Planning Efforts

LADWP is exploring partnership efforts with other utilities to develop long-term alternatives to maximize recycled water use beyond the FY 2024/25 Near-term projects planning horizon. To maximize recycled water use LADWP is investigating the following options:

- **Las Virgenes Municipal Water District Partnership Full Expansion**
  Las Virgenes MWD produces an excess supply of recycled water in the winter time at TWRF. With seasonal storage in place, over 2,000 AFY of recycled water

could potentially be available for Los Angeles. Finding additional customers or expanding infrastructure, such as a new pipeline connecting to the existing recycled water system, could allow LADWP to use the additional supply.

- **City of Burbank Partnership Full Expansion**

  Burbank Water & Power produces an excess supply of recycled water. Up to 6,000 AFY is estimated to be available. Finding additional customers or expanding infrastructure, such as a new pipeline connecting to the existing recycled water system, could allow LADWP to use the additional supply.

- **Hyperion Full Expansion Plus West Basin Municipal Water District Partnership**

  HWRP has the potential to supply additional secondary effluent (or further treated effluent) to WBMWD. West Basin's existing pump station is being expanded from 40 mgd to 70 mgd, with a potential full expansion to 98 mgd. LADWP does not anticipate a significant number of additional customers and uses because HWRP is located near the City of LA boundary away from areas identified for future recycled water expansion. Even though the majority of increased recycled water supply is likely to be used by West Basin MWD and other agencies, LADWP may be able to connect some additional customers as part of the overall expansion.

4.4.4 Cost and Funding

The capital cost of expanding the recycled water system to achieve the goal of 59,000 AFY of recycled water through the construction of near term projects and the GWR project is estimated at $1 – 1.2 billion. Capital costs to construct the GWR project are estimated at approximately $450 million in 2015 dollars. The project annual operations and maintenance costs are estimated at $22 million per year in 2015 dollars.

Unit Cost

Non-potable reuse and GWR projects are diverse, and result in a wide range of costs to implement and sustain. Non-potable reuse projects present numerous challenges, including distance from treatment plant and the associated transmission pipeline construction costs. This is weighed against customer size and recycled water adaptability to a particular commercial site or process. The approximate range of cost for the near-term non-potable reuse projects is estimated to be from $600 to $1,500 per acre-foot. This approximation includes capital, operation, and maintenance costs. Unit costs for the GWR project, including capital, operation, and maintenance costs, are estimated to be $910/AF in 2015 dollars.

Funding

Capital costs for RWMP projects will be covered by the funding sources identified below, as well as other sources as they become available.

- Water Rates – LADWP water rates are the primary funding source for the recycled water program.

- Federal Funding – LADWP will pursue Federal funding as it becomes available. In the past LADWP has received funding for recycled water projects from the Federal Water Project Authorization and Adjustment Act of 1992, Public Law 102-575 (HR429), and the United States Bureau of Reclamation Title XVI Program.

- State Funding – LADWP will pursue State funding for recycled water projects through the SWRCB and DWR as it becomes available. Proposition 1, Chapter 9 contains $625 million for grants and loans for water recycling projects. This funding is being administered through the SWRCB's Water Recycling Funding Program, which also provides low-interest loans from the Clean Water State Revolving Fund. Proposition 1, Chapter 7 contains $98 million for Integrated Regional Water Management implementation projects in the Los Angeles subregion (includes Ventura), including recycled water projects. IRWM funding is administered by DWR.

- MWD Local Resources Program Incentive – The Local Resources Program provides funding for water recycling and groundwater recovery projects that prevent a new demand on MWD or displace an existing demand on MWD. Financial incentives vary based upon the incentive payment structures selected by the applicant. In 2014 MWD adopted three incentive structures with incentives ranging from $340 per AF to $475 per AF based upon the incentive terms. As of FY 2014/15, LADWP has 11 funded LRP agreements with MWD for recycled water projects, and another 4 which are in some phase of the application process.

4.4.5 Outreach and Agency Coordination

Outreach with key stakeholders and the public, and coordination with agencies is necessary for the success of the City's recycled water program. LADWP and LASAN initiated an extensive outreach process in 2009 with the formation of the Recycled Water Advisory Group (RWAG).

Stakeholder Process

Through the combined outreach efforts of the LADWP and LASAN, the City continues to promote the advantages and safety of recycled water use. Outreach strategies include briefing key influential stakeholders and elected officials as well as presentations to Neighborhood Councils and community groups. Water recycling staff participates in multiple community events and responds to public inquiries regarding the City's goals and water supply challenges.

In addition, LADWP staff continues to reach out to K-12 students and faculty to educate them about the urban water cycle, the recycled water program, and various water treatment technologies.

At the center of the City's outreach efforts is continued dialog with stakeholders through the RWAG. The RWAG is a group of approximately 70 stakeholder organizations with varied perspectives representing specific ethnic groups, water interests, community groups, neighborhood councils, environmental groups, and business affiliations. The RWAG was formed in 2009 by the LADWP and LASAN to actively engage with the public regarding the negative perception of recycled water through two way communication. Since the group's launch, RWAG members have participated in a series of half-day workshops, tours, and other informational sessions which have familiarized them with the details of the water recycling process. The RWAG provided guidance in the development of the City of LA Recycled Water Master Planning documents. RWAG members have also formed working groups such as the Consensus Statement Working Group and the Public Outreach Working Group to tackle focused objectives.

Two main roles of the RWAG were:

1) To provide input on recycled water options from technical, environmental, financial, and social viewpoints.

2) Consider key project issues and discuss implementation challenges and acceptability.

The RWAG continues to share their opinions and concerns regarding the City's recycled water program during the planning and implementation of the Groundwater Replenishment project. The City also continues to outreach to the general public through elected official briefings and presentations to Neighborhood Councils and community groups.

Agency Coordination

To maximize recycled water use and to move forward with recycled water efforts, LADWP has closely coordinated and continues to coordinate with agencies at the local and state levels. Coordination is necessary to ensure adequate funding, identification of end-users, adequate availability of supplies, permitting and regulatory approvals, and regional cooperation. If Federal funding opportunities become available, LADWP will also coordinate with the applicable Federal agencies. Exhibit 4U provides a summary list of agencies that LADWP either coordinated with or is currently coordinating with to maximize recycled water use.

Financial Incentives

LADWP also coordinates recycled water end use with potential customers by assisting with facility retrofits and public education. Recycled water is provided to customers at a cost less than potable water. LADWP has implemented a new incentive program on July 11, 2012 designed to assist with onsite retrofits to convert customers to the use of recycled water.

4.4.6 Recycled Water Quality

All recycled water provided by LADWP meets, at minimum, Title 22 standards. Title 22, Chapter 4, of the California Code of Regulations establishes water quality standards and treatment reliability criteria for water recycling to ensure public safety as discussed in Section 4.1. Title 22 standards are achieved with tertiary treatment and disinfection.

Advanced wastewater treatment is currently provided for the Dominguez Gap Seawater Barrier at the TIWRP by the AWTF. The AWTF has advanced treatment that includes microfiltration and reverse osmosis, which removes many of the impurities remaining after tertiary treatment and disinfection. This level of treatment is proposed to be implemented for the planned groundwater replenishment project being developed. DCTWRP effluent used to recharge the San Fernando Basin via spreading basins is expected to undergo the additional treatment of advanced oxidation. Exhibit 4C, located in Section 4.2, summarizes the level of treatment provided by each of the City's water reclamation plants.

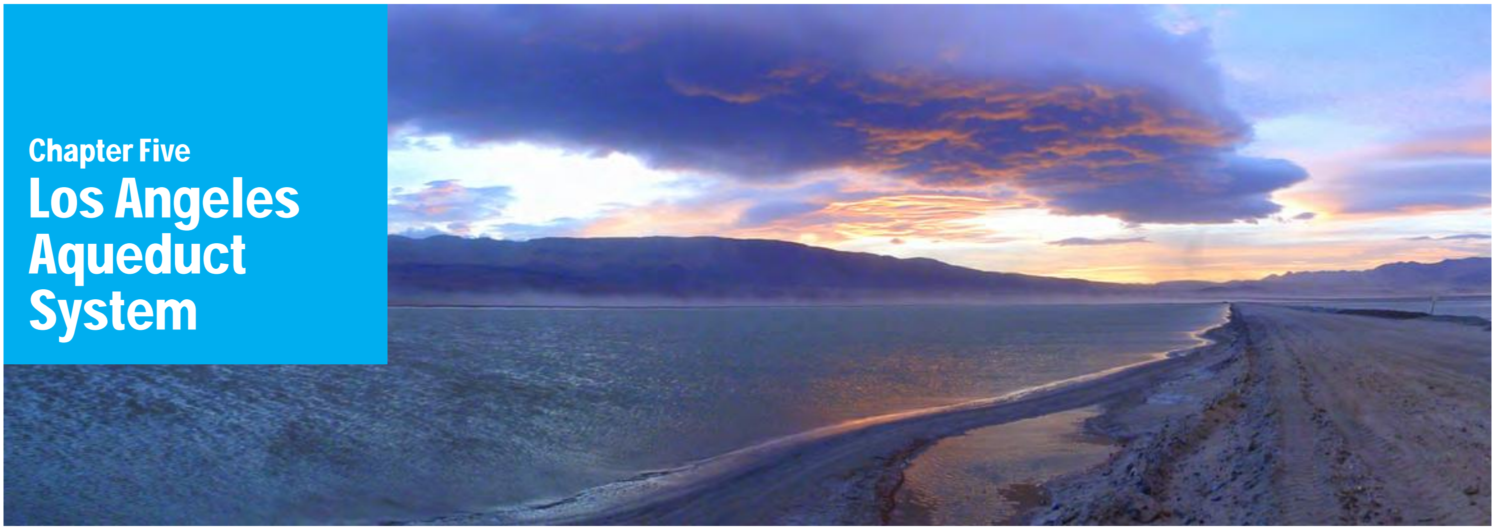
Exhibit 4U
Recycled Water Agency Coordination

Burbank Water and Power[1]	Los Angeles County Department of Public Works[1]
Central Basin Municipal Water District[1]	Metropolitan Water District of Southern California[1]
Glendale Water and Power[1]	Pasadena Water and Power[1]
Los Angeles County Sanitation Districts[1]	Water Replenishment District of Southern California[1]
Long Beach Water Department[1]	West Basin Municipal Water District[1]
Las Virgenes Municipal Water District[1]	Los Angeles Regional Water Quality Control Board
State Water Resources Control Board	Los Angeles County Department of Public Health
California Department of Public Health	City of Los Angeles Department of Public Works, Bureau of Sanitation

1. Met with agencies individually to discuss potential regional recycled water use.

Chapter Five

Los Angeles Aqueduct System

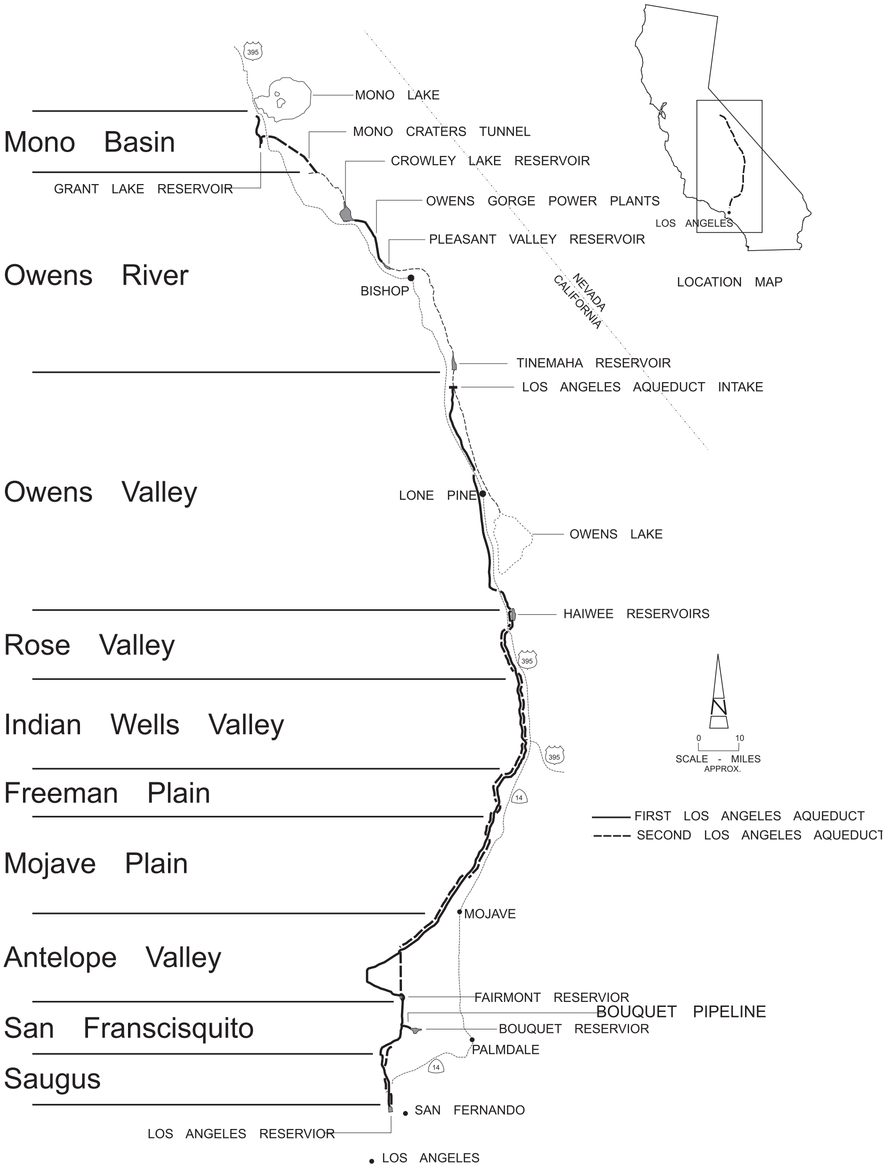


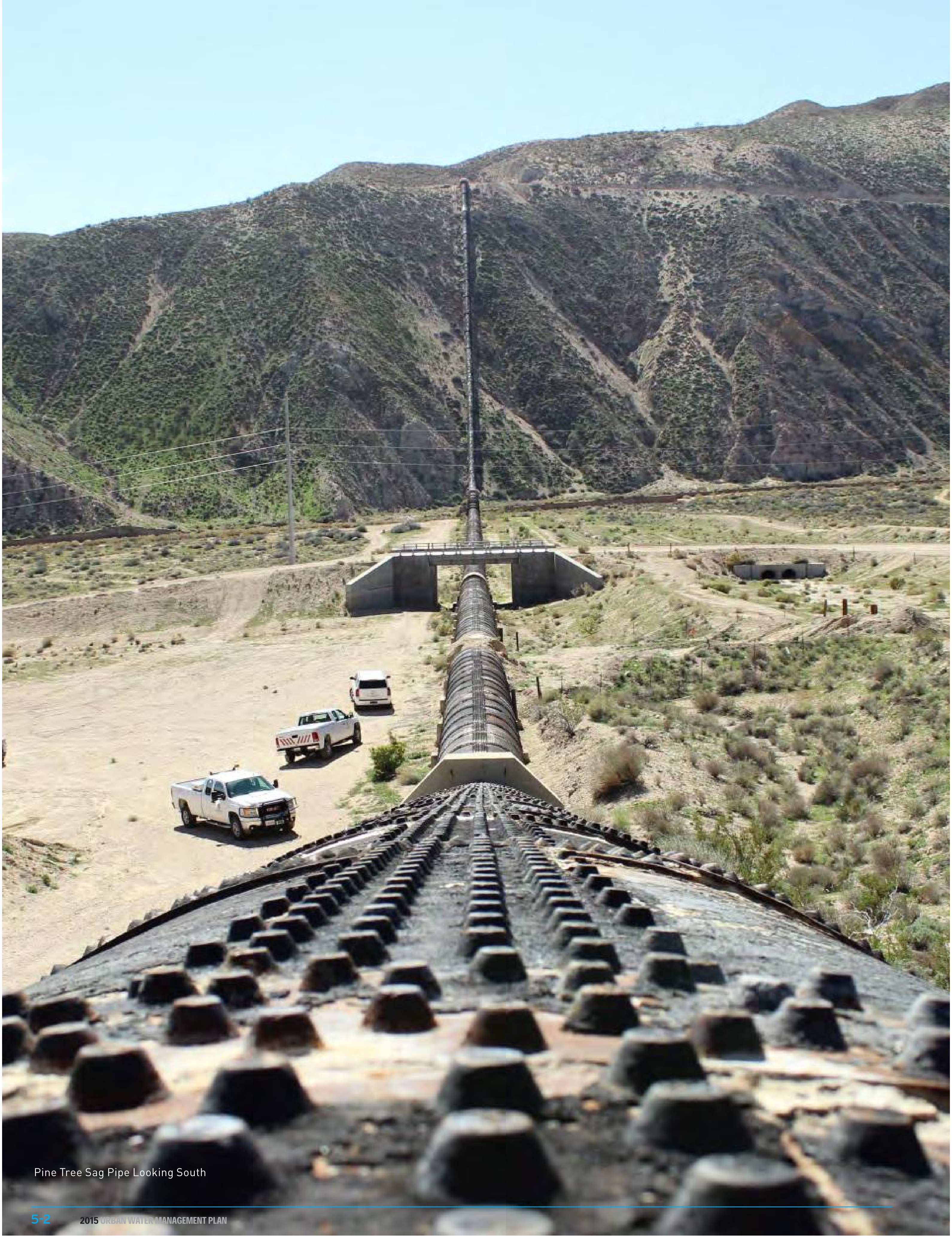
Stormy Sunrise on Owen's Lake

5.0 Overview

Local water supplies have been an integral part of the City's history. The City's population and economy was initially supported through a combination of local surface flows primarily from the Los Angeles River, and local groundwater pumping primarily from the San Fernando Basin. When it became apparent that the local groundwater supply and local surface flows were insufficient to meet the future water needs of the City, the citizens of Los Angeles under the leadership of William Mulholland approved by a 10 to 1 margin a $23 million bond measure to construct the First Los Angeles Aqueduct in 1913. This investment was equal to 12 percent of the entire City's assessed valuation at that time. Then in 1940, an additional $40 million was spent to extend the first aqueduct 40 miles north from the Owens River to streams that were tributaries to Mono Lake, see Exhibit 5A.

Exhibit 5A
Los Angeles Aqueduct System





Pine Tree Sag Pipe Looking South

To meet the additional water needs of its population, the City decided to construct a second barrel of the Los Angeles Aqueduct in 1963, later to become known as the Second Los Angeles Aqueduct. Construction of the Second Los Angeles Aqueduct was completed in 1970. The second aqueduct increased the City's capacity to deliver water from the Mono Basin and the Owens Valley to Los Angeles from 485 cubic feet per second (cfs) to 775 cfs.

The value of the City's historical investment in the Los Angeles Aqueduct (LAA) System is substantial. For nearly a century, the City has benefited from the delivery of high-quality, cost-effective water supplies from the Eastern Sierra Nevada.

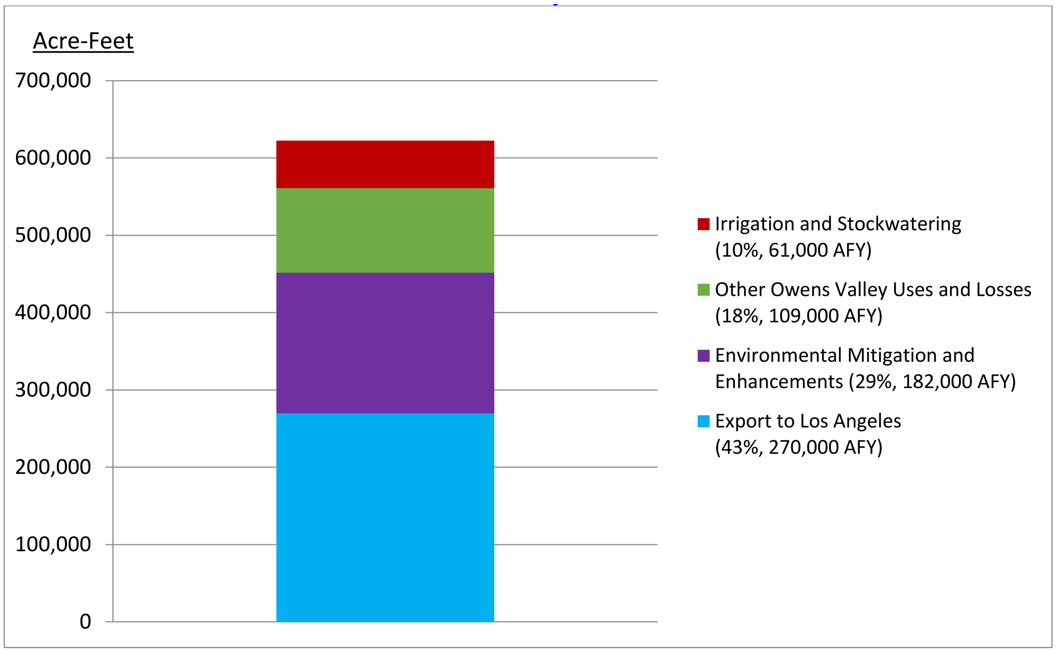
Over time, environmental considerations have required that the City reallocate approximately one-half of the LAA water supply to in-valley uses and environmental mitigation and enhancement projects. Between 1992 and 2015, the City has used approximately 182,000 acre-feet per year (AFY) of water to supply environmental mitigation and enhancement projects in the Owens Valley and Mono Basin. That is in addition to about 61,000 AFY supplied for irrigation and stockwater and 109,000 AFY for other in-valley uses, including uses on Native American Reservations and private lands, recharge, and evaporation and conveyance losses.

In 1991, the County of Inyo and the LADWP entered into a court-ordered agreement, the "Long Term Water Agreement," which established an overall goal for managing groundwater resources within Inyo County. The intent is to avoid certain described decreases and changes in vegetation, and to cause no significant effect on the environment which cannot be acceptably mitigated, while providing a reliable supply of water for export to Los Angeles and for use in Inyo County. In 1994, the State Water Resources Control Board (SWRCB) entered Decision 1631 which amended City water right licenses 10191 and 10192 to establish fishery protection flows for streams tributary to Mono Lake, and to protect public trust resources at Mono Lake and in the Mono Basin. LADWP's water rights licenses in the Mono Basin are under revision pursuant to a 2013 Settlement Agreement reached between LADWP, the Mono Lake Committee, California Trout and the California Department of Fish and Wildlife. LADWP's proposed license amendments include modification of the Grant Reservoir Spillgate to accommodate a new flow regime that will facilitate higher peak flows and more accurately manage lower wintertime base flows in order to complete fishery and habitat restoration on Rush Creek.

Prior to operation under the Long Term Water Agreement, average in-valley water uses and losses totaled 216,000 AFY. In contrast, these uses and losses increased to 278,000 AFY following implementation of the Long Term Water Agreement. Prior to Decision 1631, water exports from Mono Basin into the LAA averaged 90,000 AFY compared to recent average exports of 16,000 AF from the Mono Basin. Limiting water deliveries to the City from the LAA has directly led to increased dependence on imported water supplies from MWD. LADWP's purchase of supplemental water from MWD in FY 2013/14 was at an all-time high.

As indicated in Exhibit 5B, LAA deliveries comprise 43 percent of the total runoff in the Eastern Sierra Nevada in an average year, from Runoff Year (RY) 1992/93 to RY 2014/15. RY is measured from April 1st to March 31st of the following year. The majority of rainfall in the Eastern Sierra Nevada stays in the Mono Basin, Owens River, and Owens Valley serving ecosystem and other uses.

Exhibit 5B
Mono Basin and Owens Valley Water Use Allocations[1]



1. The average post-Water Agreement year begins RY 1992/93 and ends RY 2014/15

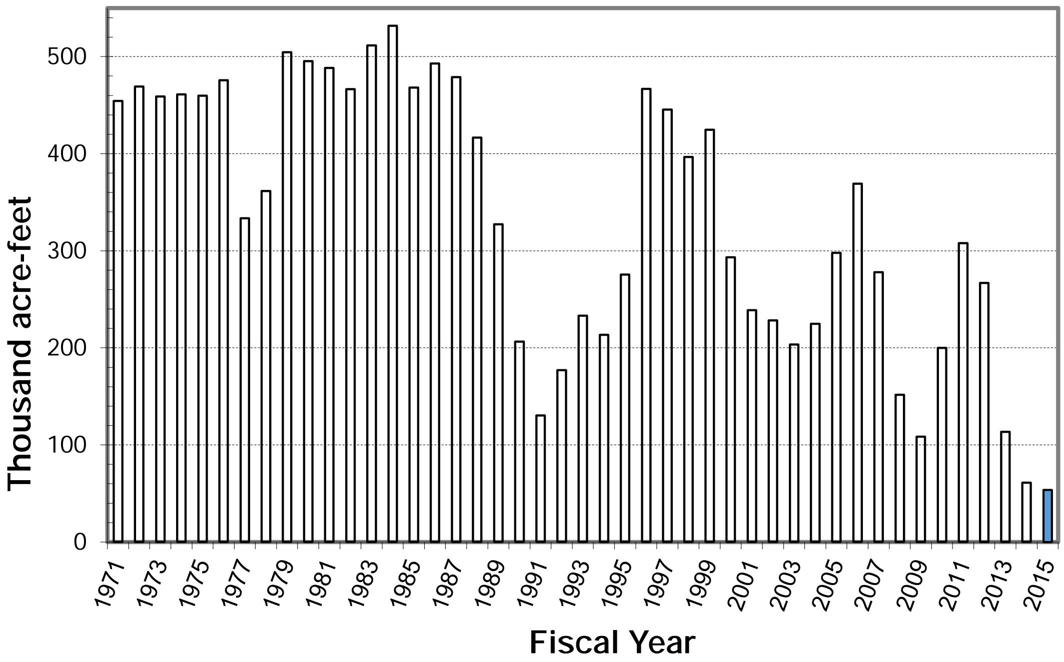
5.1 Historical Deliveries

Annual LAA deliveries are dependent on snowfall in the Eastern Sierra Nevada. Years with abundant snowpack result in larger water deliveries from the LAA, and typically reduced purchases of supplemental water from Metropolitan Water District (MWD). Conversely, low LAA deliveries in dry years increase the demand for supplemental water from MWD.

The impact to LAA water supplies due to varying hydrology in the Mono Basin and Owens Valley is amplified by the requirements to release water for environmental enhancement efforts in the Eastern Sierra Nevada. Since 1989, when City water exports were significantly reduced to comply with State Water Board orders to enhance the Mono Basin's ecosystem, LAA deliveries from the Mono Basin and Owens Valley ranged from 53,500 AF in FY 2014/15 to 466,600 AF in FY 1995/96. Average LAA deliveries since FY 1989/90 have been approximately 244,700 AFY, which is on average 40 percent of the City's total water needs.

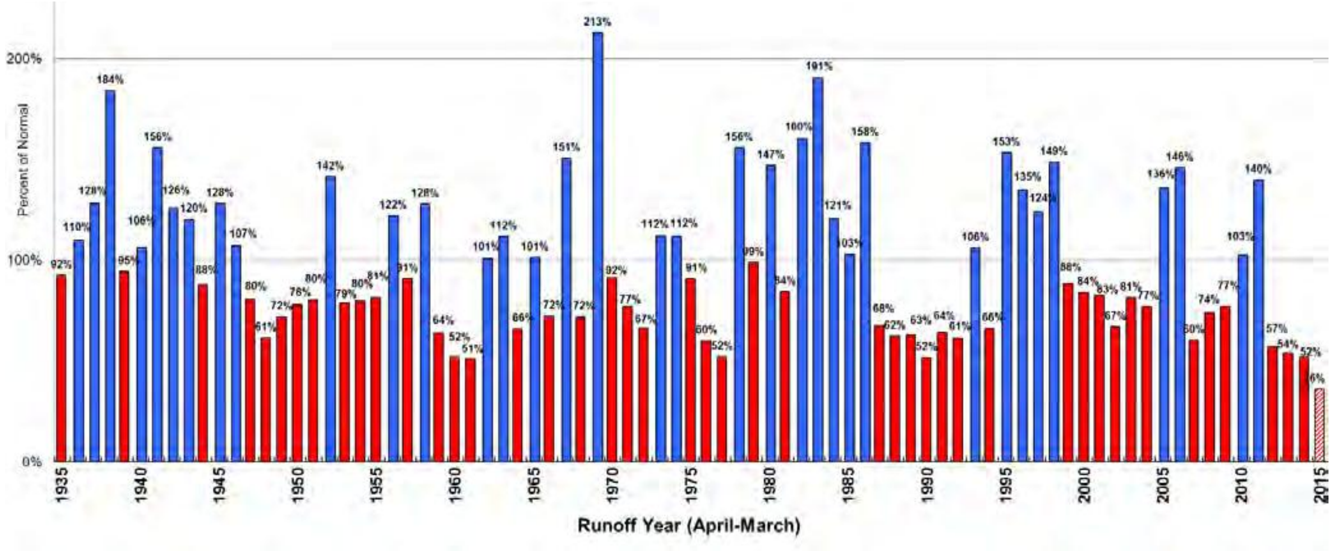
The cyclical nature of hydrology is exhibited best by LAA deliveries over the last fifteen years. This general period was characterized by a series of wet years, followed by a series of dry years that have extended into the current drought period. From FY 2010/11 through 2014/15, LAA deliveries supplied an average of 29 percent of the City's water needs. The reliability impact of hydrologic cycles on LAA supplies is evident throughout historical deliveries. A broader look at how deliveries from the LAA have fluctuated from year to year is shown in Exhibit 5C. In the 1970s and 1980s, majority of the aqueduct deliveries were above 400,000 AFY. They began to slide and dropped below 150,000 AFY by FY 1990/91 due to a severe drought. Deliveries recovered above 400,000 AFY in FY 1995/96 but started declining after the implementation of new environmental allocations. Deliveries in the two short wet periods around FY 2005/06 and FY 2010/11 have never rebounded back to above 400,000 AFY. Beginning in 2012, a multiple-year drought impacted the entire California State and LAA deliveries reached a new record low of 53,500 AF during FY 2014/15.

Exhibit 5C
Historical Los Angeles Aqueduct Deliveries



A long term perspective of the general cycle of wet and dry years for the Owens Valley is evident in Exhibit 5D, particularly since the late 1960s. As illustrated, reliance solely on one water supply source is not practical. Therefore, the City relies on the LAA in combination with the Colorado River Aqueduct and the State Water Project as the City's primary imported water sources. These imported sources combined with local groundwater, recycled water, and conservation make up the City's total water supply portfolio. This portfolio of water resources is fundamental to LADWP's ability to deliver a reliable water supply to meet the needs of nearly 4 million residents of Los Angeles.

Exhibit 5D
Owens Valley Runoff Percent of Normal



5.2 Mono Basin and Owens Valley Supplies

Surface runoff from snowmelt in the Eastern Sierra Nevada Mountains is the primary source of supply for the LAA. The LAA extends approximately 340 miles from the Mono Basin to Los Angeles. Water is conveyed the entire distance by gravity alone. LADWP regulates deliveries to the Los Angeles Aqueduct Filtration Plant through storage control at nine reservoirs. Six reservoirs are used for storage: Grant Lake, Long Valley, Tinemaha, North Haiwee, South Haiwee, and Bouquet Reservoir. The remaining three reservoirs are used to regulate flow for hydroelectric power plant generation, which include Pleasant Valley, Fairmont, and Drinkwater. The total combined reservoir storage capacity of the system is 300,246 AF. Hydroelectric power is generated at 12 power plants along the LAA. Combined maximum capability of the power generation facilities is 215 mega-watts.

The LAA is fed by runoff from the eastern slope of the Sierra Nevada Mountains. Runoff from the eastern slope reaches its maximum in the late spring and summer, after most of the year's precipitation has already occurred. The snowpack in the Eastern Sierra Nevada provides natural storage for the LAA system. This snowpack storage is necessary in light of the minimal regulatory storage capacity along the LAA system.

Water Rights

The City's water rights in the Eastern Sierra Nevada are comprised of riparian rights, pre-1914 appropriations, and post-1914 appropriations held on various streams in the Mono Basin and Owens Valley. Riparian rights are for stream flow used on land adjacent to the stream. Appropriations by the City based on post-1914 water rights are made pursuant to licenses issued by the SWRCB. The majority of the City's water rights are pre-1914 water rights established prior to enactment of the State Water Commission Act. The most significant basis for export of surface water from the Eastern Sierra Nevada is an appropriation claim in 1905 to divert up to 50,000 miner's inches (1,250 cfs) from the Owens River at a location approximately 15 miles north of the town of Independence into the LAA for transport to Los Angeles. The City files supplemental statements (for riparian and pre-1914 water rights) and licensee reports (for post-1914 water rights) of water diversion and use with the SWRCB for its diversions during each calendar year.

The City's water right licenses in the Mono Basin were amended by the SWRCB in 1994 through the Mono Lake Basin Water Right Decision 1631. Recently, water exported from the Mono Basin has been limited to 16,000 AFY based on a court order to raise the target elevation of Mono Lake and restore four streams that flow into Mono Lake. For RY 2015/16, the water exported from Mono Basin will be limited to 4,500 AF, as the Mono Lake water level dropped below the Water Right Decision 1631 trigger elevation of 6,380 feet.

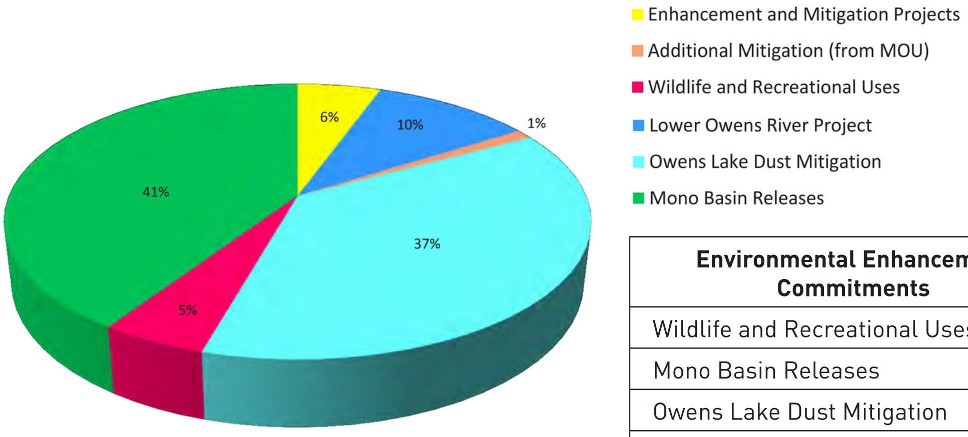
In 2013, LADWP, California Department of Fish and Wildlife, California Trout, and Mono Lake Committee entered into the Settlement Agreement Regarding Continuing Implementation of Water Rights Orders 98-05 and 98-07 (Settlement Agreement). Pursuant to the Settlement Agreement, further amendments by the SWRCB to the City's water right licenses are pending.

The primary groundwater right through which Los Angeles has developed groundwater resources in the Owens Valley is based on ownership of a majority of the land (approximately 314,000 acres) and associated water rights in the Owens Valley. LADWP manages groundwater resources in Inyo County according to a 1991 agreement between Inyo County and LADWP. In 1991, the County of Inyo and the LADWP entered a court ordered agreement, the "Long Term Water Agreement," which established an overall goal for managing groundwater resources within Inyo County. The intent of this agreement is to avoid certain described decreases and changes in vegetation, and to cause no significant effect on the environment which cannot be acceptably mitigated, while providing a reliable supply of water for exports to Los Angeles and for use in Inyo County.

5.3 Environmental Enhancement and Mitigation

Over time an increasingly larger portion of the LAA water supply has been reallocated to the environment. As a result, the City's average supply for environmental enhancement in the Owens Valley and Mono Basin has amounted to 182,000 AFY. To attempt to compensate for the loss of traditional LAA water supplies, LADWP has funded stormwater capture, conservation, and water recycling programs in Los Angeles to augment locally-developed supplies. Exhibit 5E illustrates the breakdown of LAA water supply by category. The environmental enhancement and mitigation projects that have been implemented as part of the City's commitment to meet the environmental water needs of the Owens Valley are also shown as part of Exhibit 5E. Among the environmental projects, LADWP is diverting 9,000 AFY for wildlife and recreational uses, 74,000 AFY for Mono Basin releases, 68,000 AFY for Owens Lake Dust Mitigation, 19,000 AFY for the Lower Owens River Project (LORP), 10,000 AFY of water from the LAA for Owens Valley enhancement and mitigation projects, and 2,000 AFY for additional mitigation for the Memorandum of Understanding (MOU). The Enhancement and mitigation projects were identified and described in the 1991 Environmental Impact Report on Water from the Owens Valley to supply the Second Los Angeles Aqueduct and noted subsequently in the Mitigation Monitoring Program. The 1997 MOU between LADWP, Inyo County, California Department of Fish and Game (CDFG), California State Lands Commission (SLC), Sierra Club, Owens Valley Committee (OVC), and Carla Scheidlinger outlines the requirement for environmental commitments in addition to those identified in the 1991 Environmental Impact Report concerning LADWP's groundwater pumping and related activities.

Exhibit 5E
Mono Basin and Owens Valley Environmental Enhancement Commitments[1]



Environmental Enhancement Commitments	AFY
Wildlife and Recreational Uses	9,000
Mono Basin Releases	74,000
Owens Lake Dust Mitigation	68,000
Lower Owens River Project	19,000
Enhancement and Mitigation Projects	10,000
Additional Mitigation (from MOU)	2,000
Sub Total	182,000

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1. The average post-Water Agreement year begins RY 1992/93 and ends RY 2014/15

Mono Basin

Exhibit 5F provides the maximum export levels from the Mono Basin under specified conditions as defined in the SWRCB Decision D1631 that was issued on September 28, 1994. Since the long-term average of Mono Basin exports before 1994 was approximately 90,000 AFY, the net reduction in water exports in the Mono Basin was estimated at 74,000 AFY of water mainly from Grant Lake Reservoir, Lee Vining Creek, Walker Creek, Parker Creek, and Rush Creek when Mono Lake elevation was still above 6,391 feet. As of April 2015, Mono Lake elevation reached 6,379 feet. This means that LADWP's Mono Lake exports will decrease to 4,500 AF for RY 2015/16 as opposed to 16,000 AF for RY 2014/15.

Extensive restoration and monitoring programs in the Mono Basin have improved the streams, riparian, fishery, and waterfowl habitats. In 2013, LADWP, California Department of Fish and Wildlife (CDFW), California Trout, and Mono Lake Committee (the Parties) entered into the Settlement Agreement Regarding Continuing Implementation of Water Rights Orders 98-05 and 98-07 (Settlement Agreement). The Settlement Agreement called for implementation of new flow regimes for the Mono Lake tributaries which included discharges of up to 750 cfs into Lower Rush Creek from Grant Lake Reservoir.

Exhibit 5G summarizes the Settlement Agreements Stream Ecosystem Flow (SEF) requirements for Lower Rush Creek. SEF requirements vary in relation to seven hydrologic conditions ranging from dry to extreme wet as identified by forecasted runoff for Mono Basin.

Exhibit 5F
Mono Lake Elevation and Exports

Mono Lake Elevation (feet)		Exports (AFY)
Transition	<6,377	0
	6,377 - 6,380	4,500
	6,380 - 6,391	16,000
	>6,391	export all runoff less minimum stream flow requirements and stream restoration flows
Post - Transition	<6,388	0
	6,388 - 6,391	10,000
	>6,391	export all runoff less minimum stream flow requirements and stream restoration flows

Exhibit 5G
Rush Creek Stream Ecosystem Flows

Flow Release Schedule	Flow Requirement
Year Type - Extreme Wet	
Starting between June 23 and July 19 with the 5-day peak between June 29 and July 29	220 cfs increasing to 750 cfs, 750 cfs for 5 days, 750 cfs decreasing to 220 cfs
Year Type - Wet	
Starting between June 20 and July 7 with the 5-day peak between June 27 and July 19	170 cfs increasing to 650 cfs, 650 cfs for 5 days, 650 cfs decreasing to 170 cfs
Year Type - Wet Normal	
Starting between June 19 and July 1 with the 3-day peak between June 26 and July 10	145 cfs increasing to 550 cfs, 550 cfs for 3 days, 550 cfs decreasing to 145 cfs
Year Type - Normal	
Starting between June 17 and June 25 with the 3-day peak between June 23 and July 3	120 cfs increasing to 380 cfs, 380 cfs for 3 days, 380 cfs decreasing to 120 cfs
Year Type - Dry-Normal II	
Starting between June 2 and June 15 with the 3-day peak between June 6 and June 21	80 cfs increasing to 200 cfs, 200 cfs for 3 days, 200 cfs decreasing to 80 cfs
Year Type - Dry-Normal I	
Between May 15 and July 3	80 cfs
Year Type - Dry	
Between May 18 and July 6	70 cfs

Note: Flow requirements and release schedule can be found in Tables 1A through 1F on pages 6 - 11 of the Settlement Agreement (SWRCB, 2013).

Lower Owens River Project

Beginning December 2006, the LORP, depicted in Exhibit 5H, releases water from the LAA to create a warm water fishery along a 62-mile section of the Owens River. Water is released near the LAA intake facility and a pump back station is located downstream to return flows to the LAA or to Owens Lake for dust control measures. In accordance with the Memorandum of Understanding between LADWP, Sierra Club, Owens Valley Committee, California Department of Fish and Wildlife, California State Land Commission and Inyo County and the approved Environmental Impact Report, annual monitoring reports are to be prepared to measure project success. The first LORP Annual Monitoring Report was prepared in 2008.

The Memorandum of Understanding prescribes requirements for LORP flows. Both base flows and seasonal habitat peak flows are required for the LORP. A flow schedule is provided in Exhibit 5I. Seasonal habitat peak flows vary between 40 cfs (zero additional flows beyond the base flow requirements) to 200 cfs. For below average RY, seasonal habitat flows may be incrementally lowered from the average RY requirements of 200 cfs to 40 cfs (base flow) in proportion to the forecasted runoff flows in the watershed. Base flows are constant at 40 cfs regardless of forecasted runoff flows. It is estimated that the long-term use and transit losses from the project will be approximately 19,000 AFY.

Exhibit 5H
Lower Owens River Project Area

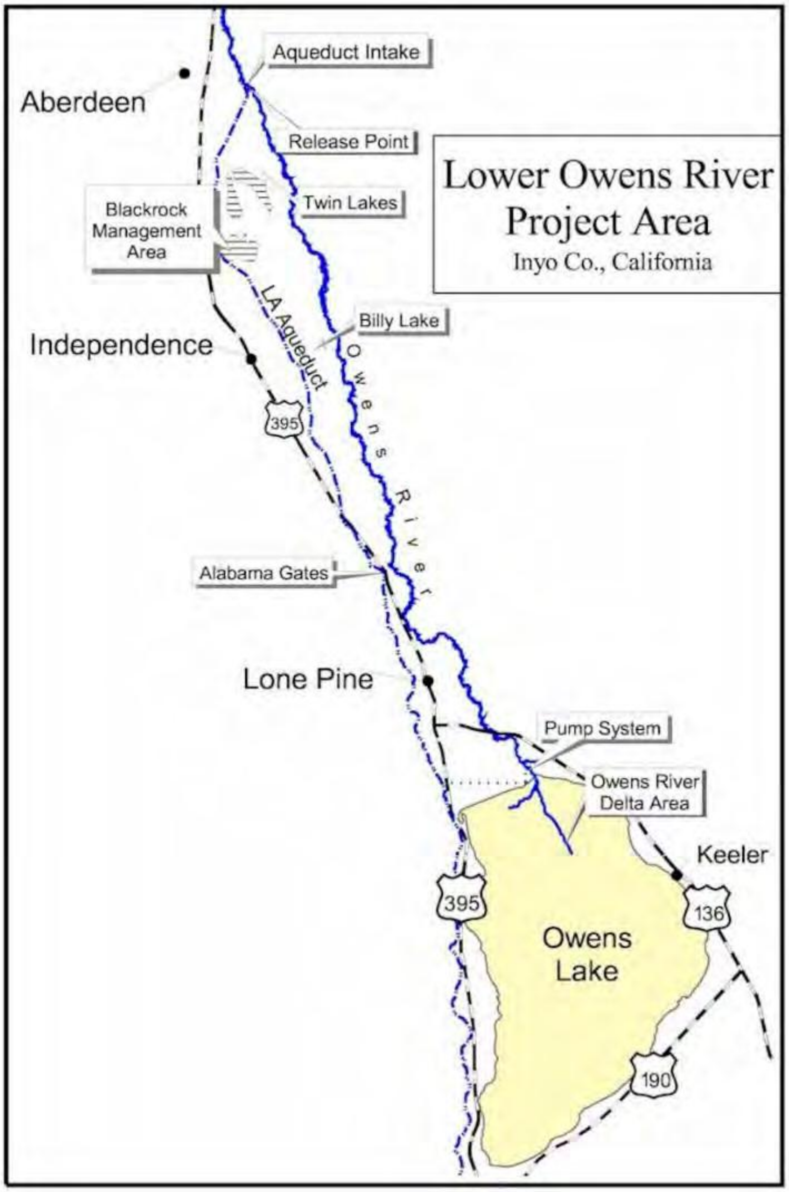


Exhibit 5I
Lower Owens River Base and Peak Seasonal Habitat Flow Requirements

Hydrologic Condition Forecasted[1]	Base Flow	Peak Seasonal
(Percent of Average Runoff)	(cfs)	Habitat Flow[2] (cfs)
50 percent or less	40	Base flow only
70 percent	40	100
100 percent or greater	40	200

1. Runoff forecast determined by LADWP's Runoff Forecast Model for Owens River Basin based on April 1st snow survey.
2. Peak season habitat flows are proportionately ramped up from 40 cfs to 200 cfs based on the percent of average runoff forecasted greater than 50 percent and less than 100 percent.

5.4 Owens Lake Dust Mitigation Program and Master Project

Historically, the Owens River was the main source of water for Owens Lake. Diversion of water from the river, first by farmers in the Owens Valley and then by the City, contributed to the lake being reduced to a small brine pool. Regulators concluded that the exposed lakebed became a major source of windblown dust, resulting in the United States Environmental Protection Agency (USEPA) classifying the southern Owens Valley as a serious non-attainment area for particulates (dust) also known as PM10 emissions in 1991. The PM standard includes Particulate Matter with a diameter of 10 micrometers or less (0.0004 inches or one-seventh the width of a human hair). USEPA's health-based national air quality standard for PM10 is below 50 microgram per cubic meter for an annual mean and below 150 microgram per cubic meter for daily concentration.

As a result of PM10 emissions exceeding regulations, the USEPA required California to prepare a State Implementation Plan (SIP) to bring the region into compliance with Federal air quality standards by 2006. In July 1998, LADWP entered into a Memorandum of Agreement with the Great Basin Unified Air Pollution Control District (GBUAPCD) that: 1) delineated the dust producing areas on the lakebed that needed to be controlled; 2) specified what measures must be used to control the dust; and 3) outlined a timetable for implementation of the control measures. The Memorandum of Agreement was incorporated into a formal air quality control SIP by the GBUAPCD. The plan was approved by the USEPA in October 1999. The regulators approved only three methods of dust control: two of which required the use of water. The California State Lands Commission staff believes that the third method, gravel cover, may not promote Public Trust Doctrine values.

LADWP's water use for dust mitigation purposes at Owens Lake has gradually increased over the years. Exhibit 5J summarizes yearly water use for the Owens Lake Dust Mitigation Program.

Exhibit 5J
Yearly Water Use on Owens Lake

Runoff Year	Total AF
2001/02	7,712
2002/03	22,983
2003/04	27,049
2004/05	28,981
2005/06	31,643
2006/07	42,542
2007/08	66,580
2008/09	61,326
2009/10	66,940
2010/11	75,267
2011/12	74,031
2012/13	75,341
2013/14	67,900
2014/15	53,700
2015/16[1]	61,000

1. RY 2015/16 is projected.

Since 2001, LADWP has diverted water from the LAA for the Owens Lake Dust Mitigation Program. A combination of shallow flooding, managed vegetation, and gravel cover are used as Best Available Control Measures for mitigating dust emissions from approximately 48.6 square miles of Owens Lake playa. Exhibit 5K provides a description of the Best Available Control Measures.

Exhibit 5K
Dust Control Mitigation Best Available Control Measures

Dust Control Measures		Description
Shallow Flooding	Sheet Flooding (Lateral)	Releases water from arrays of low-flow water outlets spaced at intervals of between 60 and 100 feet along pipelines laid along lake bed contours. Pipelines are spaced between 500 and 800 feet apart. This arrayed configuration of water delivery creates large, very shallow sheets of braided water channels. Water depths in sheet flooded areas are typically at most a few inches deep. The lower edge of sheet flooded areas has containment berms to capture and pond excess flows. The water slowly flows across the typically very flat lake bed surfaces downhill to tail-water ponds where pumps recirculate the water back to the outlets. To maximize project water use efficiency, flows to sheet flow areas are regulated at the outlets so that only sufficient water is released to keep the soil wet. Any water that does reach the lower end of the control area is collected and recirculated back through the water delivery system.
	Shallow Flooding (Pond)	Water containment berms that allow ponds to be formed that submerge the emissive lake bed areas. These ponds are up to four feet deep. The containment berms are typically rock-faced to protect them from delivery to the pond area until the pond reaches a size and depth sufficient to submerge the required amount of emissive water. Water delivery then ceases until evaporation reduces the pond size to a set minimum.
	Tillage with Best Available Control Measure Backup (TwB2)	TwB2 consists of soil tilling and/or wetting within all or portion of Shallow Flooding Best Available Control Measure where sufficient shallow flood infrastructure and available water supply exists.
	Brine Shallow Flooding	Brackish water containment berms that allow ponds to be formed that submerge the emissive lake bed areas. These ponds are up to four feet deep. The containment berms are typically rock-faced to protect them from delivery to the pond area until the pond reaches a size and depth sufficient to submerge the required amount of emissive water. Brackish water delivery then ceases until evaporation reduces the pond size to a set minimum.
Managed Vegetation		Control measure consists of creating a farm-like environment from barren playa. The saline soil must first be reclaimed with the application of relatively fresh water and then planted with salt-tolerant plants that are native to the Owens Lake basin. Thereafter, soil fertility and moisture inputs must be managed to encourage rapid plant development and maintenance. Existing Managed Vegetation areas are irrigated with buried drip irrigation tubing and a complex network of buried drains to capture excess water for reuse on the Managed Vegetation area or in Shallow Flooding areas. Managed Vegetation is sustainable at Owens Lake only if salt from the naturally occurring shallow groundwater is prevented from rising back into the rooting zone.
Gravel Blanket		Two to four-inch layer of coarse gravel laid on the surface of the Owens Lake playa will prevent emissions by preventing the formation of efflorescent evaporate salt crusts, because the large pore spaces between the gravel particles disrupt the capillary movement of saline water to the surface where it can evaporate and deposit salts. The gravel also creates a surface that has a high threshold wind velocity so that direct movement of the large gravel particles is prevented and the finer particles of the underlying lake bed soils are protected. Gravel Blankets are effective on essentially any type of soil surface.

LADWP has achieved the regulatory requirements of the Phase 7A Project by the required deadline of December 31, 2015. With completion of the Phase 7A Project's dust mitigation components, LADWP has mitigated approximately 45 square miles of dust emissions from Owens Lake playa. Exhibit 5L provides a summary of the phases and their completion dates.

Exhibit 5L
Owens Dust Mitigation Program

Phase	Date Competed
Phase 1 North	December 2001
Phase 1 South	July 2002
Phase 2	April 2003
Phase 3	September 2004
Phase 4	November 2005
Phase 5	December 2006
Phase 7	April 2010
Phase 8	October 2012

Exhibit 5M provides a summary of the GBUAPCD's SIPs and square miles of dust mitigation completed under the SIP.

Exhibit 5M
Owens Dust Mitigation Completed

SIP	Total Area Mitigated (Square Miles)
1998	16.5
2003	13.3
2008	14.7

LADWP reached a historic agreement with the GBUAPCD on November 14, 2014. The agreement was entered as a Stipulated Judgment approved by the Sacramento County Superior Court on December 30, 2014. The agreement for the first time established an upper limit of 53.4 square miles that the City could potentially be ordered to mitigate dust emissions from Owens Lake playa by the GBUAPCD. Without the agreement, the City could have been potentially responsible for mitigating dust emissions for up to approximately 88 square miles of Owens Lake playa, if other regulators concurred. The agreement further allows LADWP to implement new waterless dust control measure on Owens Lake playa. The agreement also contains a commitment by the GBUAPCD to collaboratively work with LADWP to develop other water efficient and non-water dust control methods for use on Owens Lake. The GBUAPCD has also agreed to support LADWP in securing the necessary approvals, right-of-ways, leases, and permits for installation of approved water efficient and waterless dust control measures from regulatory and oversight agencies such as the California State Lands Commission and CDFW. As part of this historic agreement, LADWP has agreed to mitigate dust emissions for an additional 3.62 square miles of Owens Lake playa as was originally ordered by the GBUAPCD in 2011 and 2012 (Phase 9/10 Project). The mitigation of dust emissions for the additional 3.62 square miles of Owens Lake playa is to be completed by December 31, 2017 at an estimated cost of $200 million. The Phase 9/10 Project is anticipated to result in further water conservation at Owens Lake through increasing use of water efficient and waterless dust mitigation measures. Upon completion of the Phase 9/10 Project, LADWP will mitigate approximately 48.62 square miles of dust emissions in the Owens Lake playa. Hence, the GBUAPCD's potential future dust mitigation orders to LADWP cannot exceed an additional 4.8 square miles.

LADWP is also working collaboratively with the local Native American tribes, Lone Pine Chamber of Commerce, Inyo County, GBUAPCD, CDFW, California State Lands Commission, U.S. Bureau of Land Management, U.S. Forest Service, California Native Plant Society, Eastern Sierra Audubon Society, Sierra Nevada Conservancy, Rio Tinto Minerals, and other stakeholders to develop and implement the Master Project. The Master Project's goal is to continue to meet the ambient air quality standards while maintaining wildlife habitat values on Owens Lake and conserving water.

The Master Project is anticipated to be fully implemented by 2024. The estimated cost is between $600 million to $1 billion. Depending on the Master Project's overall habitat requirements and values, LADWP anticipates conserving and further reducing water usage for dust mitigation purposes on Owens Lake to between 40,000 and 50,000 AFY.

Cascades on the Los Angeles Aqueduct

5.5 Water Quality

As land owners of much of the Mono Basin and Owens River watersheds, LADWP has placed strict limits on the extent of development impacting the City-owned watersheds. Snowmelt from the Eastern Sierra Nevada is a high quality water source containing very low concentrations of total organic carbon (TOC), bromide, and other constituents that can form disinfectant byproducts during the water treatment process. LADWP conducts routine monitoring of all of its water supplies for over 170 constituents and contaminants. One hundred of theses constituents and contaminants have enforceable standards.

The LAA supply is the main source of natural arsenic in LADWP's water supply. The Owens River flows through volcanic formations and receives input from geothermal springs throughout the Owens Valley, but predominately from Hot Creek in Long Valley. Geothermal springs in these areas have arsenic concentrations of around 200 parts per billion (ppb). Concentrations are dramatically reduced as water in the area mixes with snow melt and other pristine water sources. Historic untreated LAA water arsenic concentrations have ranged from 10 to 74 ppb. During the last 5 years of routine compliance monitoring from 2010 to 2014, the highest arsenic concentration after treatment at Cottonwood Treatment Plant and the Los Angeles Aqueduct Filtration Plant was 6 ppb, while the average arsenic concentration within LADWP's water distribution system was 3.2 ppb, both well below the current Federal and State drinking water standard of 10 ppb set by USEPA in 2000. In anticipation of more stringent arsenic regulations in the future, LADWP is taking a proactive approach in addressing this issue by investigating and planning enhanced coagulation treatment.

LADWP completed an evaluation and preliminary design report for enhanced coagulation at the Los Angeles Aqueduct Filtration Plant (LAAFP) in December 2006 as a means of addressing future water quality regulations faced by LADWP, including arsenic. However, the need to meet the Stage 2 Disinfectants/Disinfection Byproducts Rule (S2DBPR) by 2012, delayed work on the final design to complete other major projects. An enhanced coagulation facility using the process as outlined in the report is planned as part of the treatment process at the Los Angeles Aqueduct Filtration Plant by 2032.

To comply with the 2012 deadline for the S2DBPR, the water quality improvement effort focused on the conversion from chlorine to chloramine as a secondary disinfectant. LADWP obtained a 2-year extension to the 2012 compliance date citing major capital improvement projects needed to comply. This transition, which was completed in May 2014, allowed LADWP to maintain the same high level of disinfection in its water distribution system, while minimizing the formation of the disinfection byproducts (DBPs), including Total Trihalomethane, Halogenic Acetic Acid, and bromate. This conversion also required a change in the primary disinfectant used at the LAAFP. Ozone which for many years provided primary disinfection could not be used with the increasing reliance on SWP supply. Bromate, a disinfection byproduct of ozone, forms in the presence of the high bromide found in SWP supplies, especially during dry years when sea water intrusion is most pronounced. In response, LADWP built the second largest state-of-the-art ultra-violet (UV) disinfection treatment facility in the nation. The UV treatment and conversion to chloramines has reduced DBP levels in the water distribution system by nearly 50 percent. The use of chloramines will provide additional operational flexibility by allowing the blending of purchased MWD water (which contains chloramines) into the LADWP distribution system without the problems associated with creating a chlorine/chloramines interface when blending the two supplies.

5.6 Projected Deliveries

Near-term water deliveries are forecasted for the LAA using two models, the Runoff Forecast Model and the Los Angeles Aqueduct Simulation Model (LAASM). These two models, used jointly, accurately predict the amount of water available from the LAA.

The Runoff Forecast Model is used to predict total Owens Valley and Mono Basin stream runoff. The model's estimating equations were developed using historical rainfall, snowfall, and streamflow data. Model inputs consist of 6 months of antecedent rainfall and streamflow data, as well as the final snowpack levels on April 1st. The model's output is the forecasted runoff for the Owens Valley and Mono Basin during the twelve month period following April 1st, assuming that median rainfall occurs during those twelve months.

Runoff flows from the Owens Valley to the City of Los Angeles are modeled by the LAASM. LAASM uses the output of the Forecast Model as input, along with estimates of various uses within the Owens Valley. LAASM uses estimating equations based on historical data to forecast various losses, including evaporation and infiltration, as well as other inflows such as unmetered springs. The final output from LAASM is the volume of LAA water projected to be delivered to the City of Los Angeles.

Taking the foreseeable factors discussed earlier in this chapter into consideration, the average annual long-term LAA delivery over the next 25 years, using the 50-year average hydrology from FY 1961/62 to 2010/11, is expected to be approximately 278,000 AFY and gradually decline to 267,000 AFY due to climate change impact. However, with the anticipated completion of the Master Project by 2024, the projected LAA delivery will increase to 286,000 AFY due to water conserved at Owens Lake. Deliveries for a series of dry years, assuming a repeat of FY 2012/13 through 2014/15 hydrology, are expected to range from approximately 33,700 AFY to 111,400 AFY during FY 2015/16 through FY 2017/18. A single dry year minimum of 32,400 AFY is expected with a repeat of FY 2014/15 hydrology. An annual reduction factor due to climate change impact is applied for both multiple dry years and single dry years. Detailed projections of LAA deliveries by year are provided in Chapter 11, Water Service Reliability Assessment.

5.7 LAA Delivery Cost

The costs associated with the LAA water supply are primarily operation and maintenance costs. Therefore, the unit cost of importing water through the LAA to the City varies with the quantity of water delivered, which is highly dependent on hydrologic conditions. During dry years, the amount of water delivered to the City decreases, which results in an increase to the unit cost. Over the years, Eastern Sierra Nevada environmental enhancement project costs have also contributed to rising overall LAA delivery unit costs. The Owens Lake Dust Mitigation Program and Lower Owens River Project are two examples. Exhibit 5N summarizes the historical unit cost of treated water from the LAA. The peaks occurred when LAA deliveries significantly decreased during FY 1990/91, 2002/03, 2008/09, and 2014/15 with the LAA delivering 130,300 AF at $499/AF, 203,400 AF at $419/AF, 108,500 AF at $1,003/AF, and 53,500 AF at $2,723 respectively.

Exhibit 5N
Historical Unit Cost of LAA Treated Water

Exhibit 5O shows the unit cost of LAA treated water from FY 2010/11 to 2014/15. The 5-year average was $1,481/AF. The increase in cost for FY 2014/15 was due to LAA deliveries being the lowest on record.

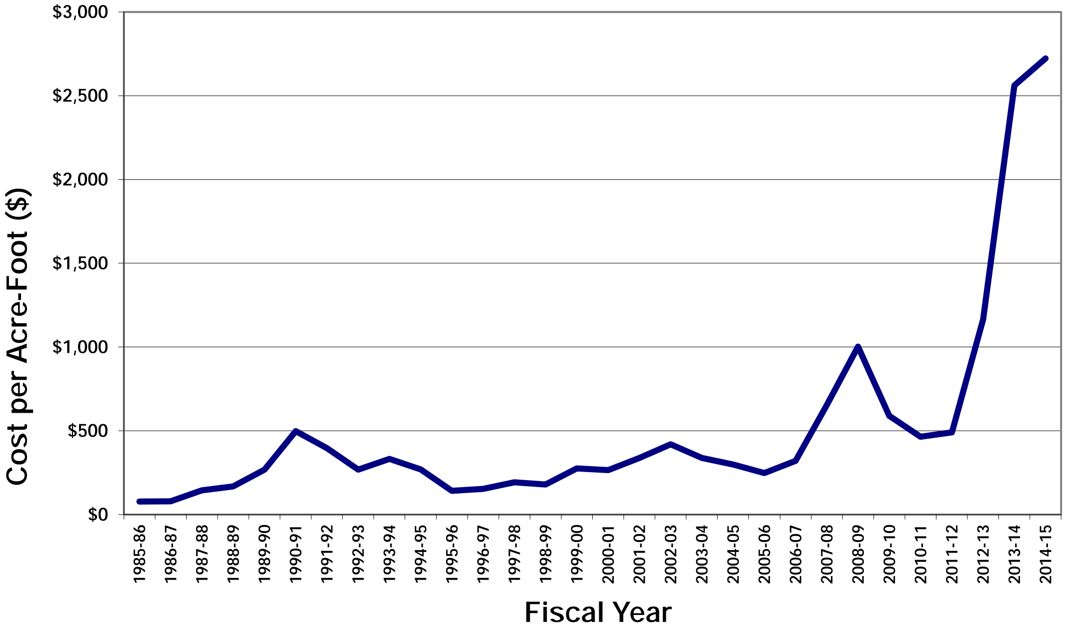


Exhibit 5O
Annual Unit Cost

	Fiscal Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
Unit Cost per AF	$464	$491	$1,165	$2,562	$2,723

Chapter Six

Local Groundwater

Mission Wellfield Water Tank

6.0 Overview

A key resource that the City has relied upon as a major component of its local water supply portfolio is local groundwater. Over the last five years local groundwater has provided approximately 12 percent of the total water supply for Los Angeles, and since 1970 has provided up to 23 percent of total supply during extended dry periods when imported supplies become less reliable. California is experiencing a multi-year dry period that began in 2012 and continued through 2015. The State's surface water resources have been diminishing during this period and the California Department of Water Resources (DWR) has responded by reducing water allocations to the State Water Project (SWP). Similar hydrologic conditions affecting the Los Angeles Aqueduct (LAA) system's source waters, contained in the Eastern Sierra snowpack, have led to historic low deliveries of Owens Valley supply. Governor Jerry Brown declared a statewide drought emergency on January 17, 2014 and signed into state law the Sustainable Groundwater Management Act (SGMA) on September 16, 2014. The Metropolitan Water District (MWD) enacted its Water Supply Allocation Plan effective July 1, 2015, thereby limiting its delivery of imported water to Southern California member agencies. As a result, local groundwater resources have become increasingly important to California communities, including Los Angeles.

Several sources of local groundwater within Los Angeles are accessible to the City. The Upper Los Angeles River Area (ULARA) watershed is the principal groundwater resource where the City produces local groundwater from the San Fernando and Sylmar Basins. The City also produces local groundwater from Central Basin and is entitled to produce water from the neighboring West Coast Basin. The Hollywood and Santa Monica Basins are local resources where the City may potentially develop future drinking water supplies in partnership with neighboring municipalities. Combined, these basins can potentially supply the City with more than 110,000 AFY of groundwater. However, various challenges have restricted the City's use of these local resources.

Industrial contamination issues are the principle reason for restricted use of local groundwater pumping by the City. Much of LADWP's pumping capacity has been impaired by contaminants, primarily volatile organic compounds (VOCs). In the San Fernando Basin (SFB), more than 80 of LADWP's 115 water supply wells have been removed from service, or restricted in use. In neighboring Sylmar Basin, contamination has caused two of three LADWP water supply wells to be removed from service. Two of ten LADWP water supply wells in the Central Basin have been impaired, taken off line, and demolished as a result of groundwater contamination issues. Water quality problems associated with hydrocarbon pollutants caused LADWP to discontinue utilizing its West Coast Basin facilities in 1980. Furthermore, declining groundwater levels and overdraft conditions have become additional concerns for

Los Angeles basins where decades of expanding urbanization, increasing impervious hardscape, and channelization of stormwater runoff have diverted natural replenishment away from local aquifers. Aging wellfields and distribution system infrastructure has also presented challenges to the development and use of the City's local groundwater resources.

Combined, these challenges have caused the City to renew its focus on sustainable management of its local groundwater basins. Responding to groundwater contamination issues has been a high priority of the City, particularly in the SFB. Recently completed studies have provided analysis of groundwater quality and characterization of the extent of contaminants affecting the City's largest well fields in the basin. Expanded basin remediation systems are under development to remove contamination from the local groundwater basin for the betterment of the environment and to restore the beneficial uses of this important basin. The expanded remediation facilities are anticipated to be operational by 2021. Efforts in the Sylmar and Central Basins have been focused on rehabilitation of LADWP's well fields. Water supply wells impaired by contamination are being replaced using modern construction standards to restore lost pumping capacity and improve water quality.

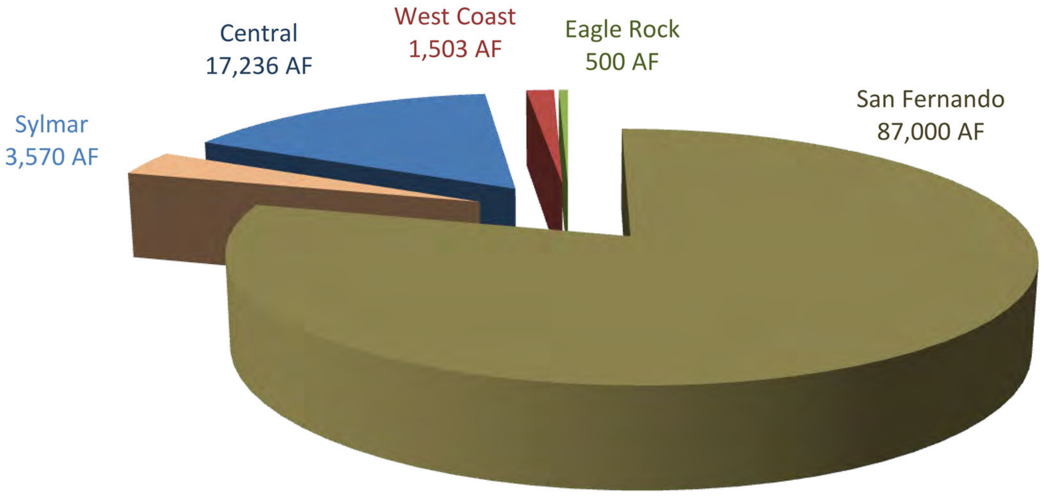
LADWP continues to invest in stormwater recharge projects to restore local groundwater basin levels by enhancing and enlarging existing stormwater capture facilities, as discussed in Chapter 7: Watershed Management and Stormwater Capture. Investments in advanced treatment systems in SFB to produce purified recycled water for groundwater replenishment and indirect potable reuse are discussed in Chapter 4: Water Recycling. These investments will help augment the City's groundwater and ensure basin water levels remain sustainable for many decades into the future. With the recent conclusion of water rights litigation in December 2015, the Superior Court of the State of California has affirmed the City's entitlements to groundwater in Antelope Valley Groundwater Basin. Although native groundwater may only be used locally within the basin, the City is entitled to use the Antelope Valley Groundwater Basin as an underground reservoir to store imported supplies for future export to Los Angeles during emergencies or dry periods.

Manhattan Wellfield

6.1 Groundwater Rights

The City owns water rights in the San Fernando, Sylmar, Eagle Rock, Central, and West Coast Basins. All of these basins are adjudicated by judicial decrees of the Superior Court of the State of California (each Judgment is provided in Appendix F). The City's combined water rights in these basins are approximately 109,809 AFY, of which approximately 87,000 AFY are located in the SFB, 500 AFY in the Eagle Rock Basin, and 3,570 AFY in Sylmar Basin. Central Basin water rights were recently increased from 15,000 AFY to 17,236 AFY as a result of three purchase transactions completed during 2014 and 2016. Water rights in the West Coast Basin are 1,503 AFY, which the City may produce from the Central Basin per the Third Amended Central Basin Judgment. Exhibit 6A graphically depicts the City's annual local groundwater entitlements by basin.

Exhibit 6A
Annual Local Groundwater Entitlement



Total: 109,809 AFY

The ULARA Groundwater Basin Adjudication

The ULARA watershed, in its entirety, is addressed in DWR Bulletin 118 as basin number 4-12. ULARA watershed encompasses four primary groundwater basins: San Fernando, Sylmar, Verdugo, and Eagle Rock Basins. The City's groundwater entitlements in these basins were established by judicial decree of the Superior Court of the State of California for the County of Los Angeles in Case No. 650079, *The City of Los Angeles, Plaintiff, vs. Cities of San Fernando, et. al., Defendants,* dated January 26, 1979 (ULARA Judgment) and the subsequent Sylmar Basin Stipulations (Sylmar Stipulation). Appendix F contains the ULARA Judgment and Sylmar Stipulation.

Groundwater Basin Management and Sustainability

The ULARA Judgment requires safe yield operations for each of the basins to ensure groundwater extractions over the long-term do not create a condition of overdraft in any one of these basins. Basin management in ULARA is achieved by collective efforts of a court-appointed Watermaster and ULARA Administrative Committee of representatives from five public water supply agencies overlying the ULARA Basins. The five public agencies include representatives from the City of Burbank, City of Glendale, City of Los Angeles, City of San Fernando, and Crescenta Valley Water District.

Reports furnished by the ULARA Administrative Committee members enable the Watermaster to publish annual reports. The annual reports monitor and account for actual and projected groundwater extractions, water imports and exports to and from each basin, natural and artificial groundwater recharge, generation and reuse of recycled water, changes in groundwater elevations and storage, and groundwater quality. ULARA Administrative Committee members have made significant contributions towards ensuring sustainable management of ULARA basins. These efforts include operation of groundwater remediation systems, use of an extensive network of groundwater monitoring wells, routine reporting on groundwater elevation and water quality, management and mitigation of urban runoff water quality, and development of enhanced stormwater recharge and groundwater replenishment.

Federal and State regulatory agencies are also involved with managing water quality and are requiring responsible parties to assist with expedited cleanup of groundwater contamination at sites within the ULARA watershed. These regulatory agencies include the Los Angeles Regional Water Quality Control Board (LARWQCB), State Water Resources Control Board—Division of Drinking Water (DDW), California Department of Toxic Substance Control (DTSC), and the United States Environmental Protection Agency (USEPA). The Watermaster and ULARA Administrative Committee members routinely meet and coordinate efforts with these agencies. As required by the 2009 Statewide Recycled Water Policy, the Watermaster and ULARA Administrative Committee members are preparing a Salt and Nutrient Management Plan for each basin within the ULARA watershed. This plan will quantify the effects and possible mitigation of salt loading activities on groundwater, in order to protect groundwater quality from long-term degradation.

Historical Groundwater Production

On average over the past five years, about 89 percent (59,621 AFY) of the City's local groundwater supply was produced from ULARA groundwater basins, while the Central Basin provided 11 percent (7,514 AFY). Exhibit 6B summarizes the City's local groundwater production by basin over the last five years.

LADWP utilizes conjunctive use strategies to optimize available surface water and groundwater to balance supplies with demand. Through conjunctive use, the timing of groundwater pumping can be used to meet varying demands. During previous successive dry-year periods, LADWP would pump groundwater at greater-than-average rates for the first few years of the drought, followed by lower pumping rates in subsequent years to facilitate groundwater basin replenishment. This strategic pumping would serve to meet dry year needs while also preventing an overdraft condition within the basin.

Since 2007, groundwater contamination issues in the SFB have greatly limited LADWP's ability to strategically increase groundwater pumping. As a result, LADWP has been limited in its ability to effectively use conjunctive use strategies for SFB groundwater operations. As basin remediation is expanded, the beneficial use of the SFB to store and supply groundwater conjunctively can begin to be restored. Eventually, LADWP will regain its ability to conjunctively use the basin to ensure water supply reliability while at the same time protecting the basin against overdraft conditions.

With the 2012 onset of the recent drought and resulting statewide water shortages, the need for groundwater supplies has never been greater. MWD encouraged all its member agencies to reduce their reliance on imported water supplies from the drought impacted SWP. LADWP

Exhibit 6B
Local Groundwater Basin Supply
Fiscal Year (July through June in AF)

Groundwater Basin	2010/11	2011/12	2012/13	2013/14	2014/15	Average	Percentage
San Fernando	44,029	50,244	50,550	68,784	80,097	58,741	88
Sylmar	225	1,330	1,952	891	0	880	1
Central	5,099	9,486	6,310	9,727	6,948	7,514	11
Total	49,353	61,060	58,812	79,402	87,045	67,135	100

responded by proactively increasing groundwater pumping from SFB to reduce LADWP's deliveries from the SWP. In an effort to respond to the statewide emergency, by maximizing this water source, LADWP cautiously increased pumping rates in the SFB recognizing that this strategy may need to be limited if contaminant concentrations at each operating wellhead increased. Water quality conditions have been closely monitored and LADWP will curtail pumping as necessary to ensure continued compliance with safe drinking water standards. As compared with previous non-drought years, LADWP successfully increased its pumping during FY 2013/14 and FY 2014/15 as shown in Exhibit 6B.

Groundwater Development and Augmentation Plan

As Los Angeles Mayor and City leaders call for locally sustainable water supplies, LADWP is taking a comprehensive approach towards development of the City's local groundwater assets. Concurrent with the pursuit of immediately beneficial groundwater projects, the Groundwater Development and Augmentation Plan (GDAP) is the next step towards developing the use, storage, and augmentation of local groundwater supplies. GDAP will help LADWP identify projects, programs, and strategies that secure, enhance, and diversify water supply to the region. GDAP will result in a prioritized program of capital improvement projects that LADWP can develop and pursue in cooperation with its regional partners.

6.2 San Fernando Basin

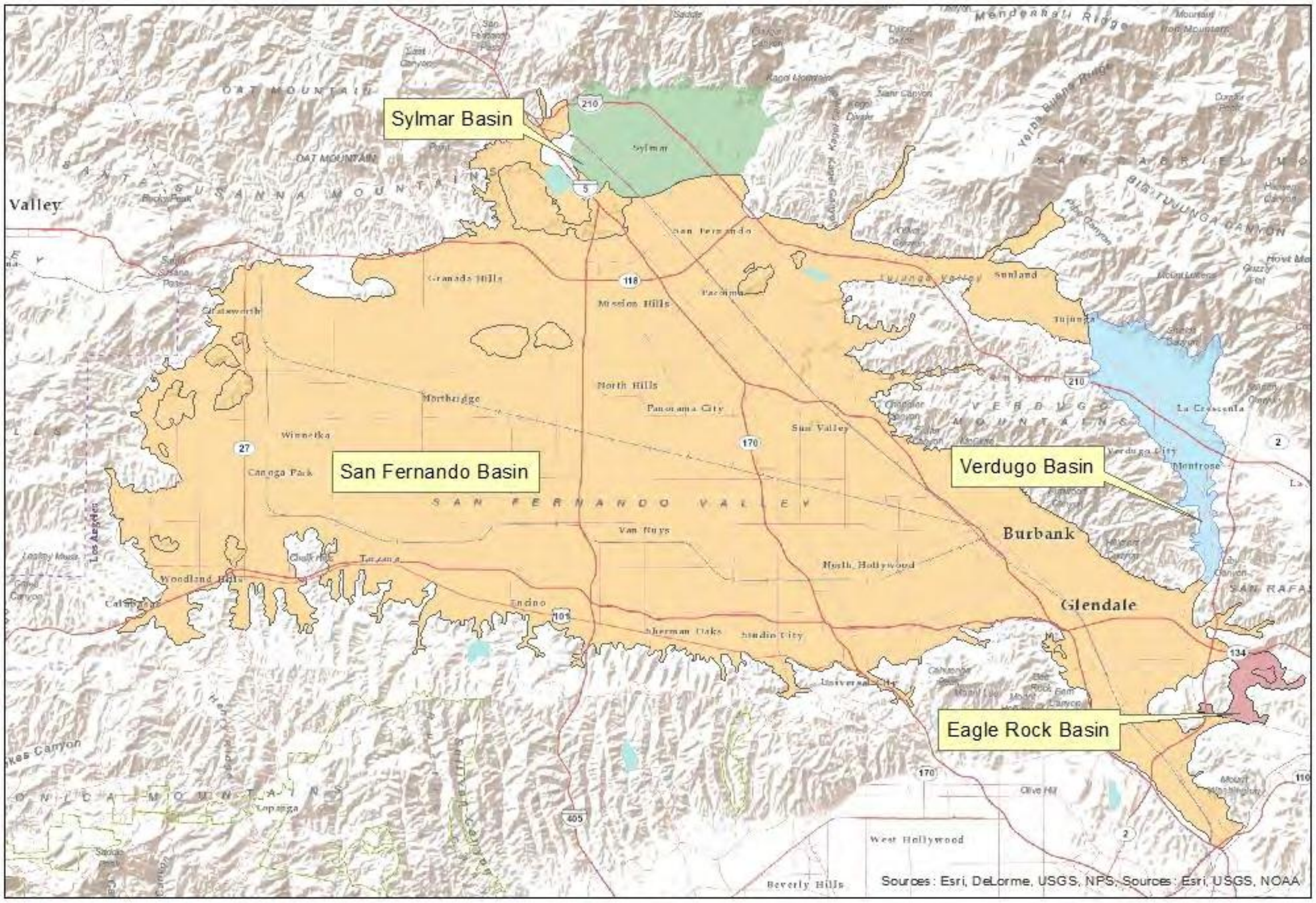
The primary source of local groundwater for the City is the SFB, which has provided as much as 92 percent of the City's groundwater supply during the recent five-year period, ranging from 44,029 AFY to 80,097 AFY. The SFB is the largest of four groundwater basins in ULARA, spanning 112,000 acres. This basin is bounded on the east by the Verdugo Mountains; on the north by the Little Tujunga Syncline and the San Gabriel and Santa Susana Mountains; on west by the Simi Hills; and on the south by the Santa Monica Mountains. Exhibit 6C provides a map depicting the four groundwater basins of ULARA.

LADWP's well fields were generally installed over a 65-year period spanning from 1924 to 1991.LADWP has ten major well fields within the SFB comprising a total of 115 wells, which if fully operational have a maximum pumping capacity of 540 cubic feet per second (cfs). The actual pumping capacity is significantly less due to the large number of wells that have become inoperable or restricted mostly due to contamination.

Tujunga, Rinaldi-Toluca, and North Hollywood Wellfields are LADWP's largest and primary well fields providing a maximum combined pumping capacity of nearly 268 cfs. The Tujunga and Rinaldi-Toluca Wellfields provide nearly 70 percent (213 cfs) of the City's maximum active pumping capacity in SFB. Erwin, Verdugo, and Whitnall provide flexibility and additional capacity of 29 cfs. Pollock Wellfield is located along the Los Angeles River Narrows and provides nearly 6 cfs of capacity to produce groundwater that would otherwise outflow from the SFB. The North Hollywood Operable Unit (NHOU) Wellfield is a USEPA Superfund facility that provides approximately 2 cfs remediation capacity with treated groundwater being discharged into the LADWP water distribution system. Collectively these eight well fields have a maximum active capacity to pump nearly 305 cfs of SFB groundwater.

Two remaining well fields, Crystal Springs and Headworks Wellfields, have historically provided an additional 65 cfs of pumping capacity but are no longer in service. Planning efforts are underway to revitalize and restore operations at Headworks Wellfield. The most recent well fields are Rinaldi-Toluca established in 1988 and Tujunga established in 1991.

Exhibit 6C
San Fernando Basin



Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA

Groundwater Rights

In accordance with the ULARA Judgment, the City has the exclusive right to utilize the surface waters tributary to the Los Angeles River (LA River) and all native groundwater within the SFB, which represents the Pueblo Water Right of the City of Los Angeles. The City also has the right to recapture Import Return Water, groundwater derived from percolation attributable to delivered imported water. This Import Return Water is calculated each year by the ULARA Watermaster based on 20.8 percent of water LADWP delivered to customers overlying the basin, including delivery of recycled water. Native safe yield has been determined as 43,660 AFY and Import Return Water averages approximately 43,000 AFY, therefore the City's estimated water right in SFB is 87,000 AFY. The ULARA Judgment allows groundwater to be stored within the basin when the City pumps less than its annual water right, and stored water credits may be pumped in future years to supplement the City's water supply. The direct spreading of both imported surface water and recycled water by the City increases the water rights by an equal amount.

In September 2007, the Cities of Los Angeles, Glendale and Burbank entered into a ten-year Interim Agreement for the Preservation of the San Fernando Basin Water Supply (Interim Agreement). The Interim Agreement is intended to address reductions in stored groundwater within the basin and accumulation of stored water credits. The Interim Agreement acknowledged the need for projects to enhance stormwater recharge capacity, limited pumping of stored water credits, began the accounting for groundwater losses from the basin, and it also envisioned a future basin safe yield study.

In response to the Interim Agreement, LADWP has worked in collaboration with Los Angeles County Flood Control District (LACFCD), other local agencies, and non-local governmental organizations to develop and sponsor various projects that will significantly enhance stormwater recharge capacity in the basin. Additionally, as described in the Interim Agreement, the ULARA Watermaster has placed limits on the pumping and usage of stored water credits. The ULARA Watermaster determines the proportion of credits that can be made available during each water year (Available Credits) and restricts the remaining balance (Reserve Credits). As of October 1, 2013, the City has accrued stored water credits amounting to 537,453 AF, of which 175,806 AF was made available for use and 361,648 AF was placed on reserve.

As groundwater levels increase within the basin due to natural infiltration, stormwater capture, etc., more Reserve Credits will become available for use. This ensures stored water can be pumped in a sustainable manner that will not result in a condition of critical overdraft for the basin. A basin safe yield study was prepared in 2009 but not finalized. At that time, the ULARA Watermaster determined that SFB was not in a condition of overdraft and that current operations did not pose an imminent threat to water supplies. This affords basin pumpers time to complete stormwater recharge enhancement projects while also compiling data necessary for a future re-evaluation of safe yield.

Groundwater Development

Los Angeles River Narrows Underflow Study: Groundwater in the SFB naturally flows across the basin in a general southeasterly direction towards the Los Angeles River Narrows where the LA River bends to a southward alignment as it flows towards river gaging station Gage F-57C-R. Gage F-57-C-R is owned and operated by LA County Flood Control District. Groundwater becomes shallow in this area, tending to rise into an unlined reach of the LA River where it emerges as flow within the river channel. Subsurface groundwater also flows southward from this same locality leaving the SFB. This groundwater outflow is accounted for annually in the basin water budget provided with each ULARA Watermaster Report.

These annual losses are estimated using a methodology developed in the Report of Referee in 1962 utilizing readings from Gage F-57C-R and other nearby river gages. Average annual losses from 1971 through 2012 due to rising groundwater was estimated at 3,257 AFY; average annual losses due to subsurface outflow was estimated at 400 AFY. From 1915 until 1983, LADWP reduced basin outflows by diverting LA River surface water into Headworks Spreading Grounds and extracting the replenished groundwater from nearby Headworks Wellfield, until operations ceased due to discovery of contaminated groundwater at the wellheads. The Headworks Spreading Grounds has since been decommissioned and LADWP has repurposed the site for a recently constructed water storage reservoir. Pollock Wellfield, located upgradient of Gage F-57C-R, remains in operation and LADWP continues to produce groundwater intercepting much of the potential outflow losses.

During the 1990s to 2000s, a number of events resulted in the need to re-examine the outflow situation:

1. Pollock Wellfield was taken out of service for a decade until the 1999 installation of a groundwater treatment plant,
2. Headworks Wellfield and Spreading Grounds were removed from service,
3. Local stream gages were abandoned or became dysfunctional, and

4. Gage F-57C-R readings were deemed unreliable due to maintenance and construction issues.

To improve the understanding of basin outflows and accurately quantify the flux of water through the basin boundary, LADWP began working with ULARA Watermaster to evaluate various river gages and identify the need for repair or replacement of any problematic gaging station. These continuing efforts also involve coordination with LACFCD, owner of the gauging stations. LADWP is now securing an expert consultant who will prepare a hydraulic and hydrogeologic computer model to simulate groundwater flows through this region of the narrows. The results and findings will be integrated into an improved methodology for basin outflow estimations and the overall basin water budget calculation. Proposals for additional measurement systems and strategies to contain or reduce basin losses will also be considered.

Saugus Formation Exploration and Test Wells at Van Norman Complex: Two exploratory test wells have been constructed at LADWP's Van Norman Complex to investigate hydrogeology, water quality, and potential yield for groundwater production from this region of the Saugus Formation. The test wells have been sited near the Los Angeles Aqueduct Filtration Plant intake channel to accommodate test pump discharges and avoid the cost of conveyance discharge lines. The first exploratory well VN-EW-1 was completed to 1,660 feet below ground surface and exploratory well VN-EW-2 was completed to 1,680 feet below ground surface. Initial laboratory tests indicate water produced from both test wells are of acceptable water quality, complying with all safe drinking water standards. Groundwater from confined aquifer units was found to be in an artesian condition with natural flow as much as 150 gallons per minute (gpm); pumping tests will evaluate long term drawdown and sustainable yield to produce groundwater from this aquifer.

Groundwater Quality

During 1980s testing of water supply wells in SFB, trace levels of the contaminants trichloroethylene (TCE), perchloroethylene (PCE), and other VOCs were discovered. The presence of these contaminants is due to past improper chemical handling and disposal practices of industries in the San Fernando Valley. Additionally, the 1990s saw the emergence of hexavalent chromium (chromium VI or Cr(VI)) and perchlorate detected in various wells within the SFB. Nitrate concentrations have also been detected in an increasing trend since the 1990s. The source of nitrate originates from agricultural activities across the San Fernando Valley. Most recently, 1,4-dioxane has been an emerging chemical of concern with an increasing trend.

Industrial contaminants have severely impaired the majority of LADWP's 115 wells in the SFB. Of these, 57 wells have been removed from service, lowering LADWP's pumping capacity by an estimated 236 cfs. Of the remaining 58 wells, various contaminants have been recorded in 45 wells at concentrations exceeding the Maximum Contaminant Level (MCL) established by State and Federal regulatory agencies. Among these contaminants of concern are VOCs (TCE, PCE, and carbon tetrachloride), nitrates, and perchlorate. Marginal levels of contamination have been detected in the remaining 13 wells, mostly due to VOCs. Hexavalent chromium has also been detected in some of LADWP's wells. However, LADWP remediates groundwater and blends with other sources to remove or lower contaminants to concentrations below MCL to ensure groundwater delivered to customers complies with State and Federal safe drinking water standards.

LADWP's established its two largest well fields, Rinaldi-Toluca and Tujunga, in areas that were at one time believed to have been located away from known contamination areas. Since that time, these important well fields have also been significantly impacted by contamination sources that are yet to be fully investigated. As discussed in following sections, LADWP has developed various programs to accelerate basin remediation – including the comprehensive Groundwater System Improvement Study and monitoring well installation program, interim wellhead treatment facilities, and collaborative efforts with State and Federal regulatory agencies to investigate sources of contamination and identify potentially responsible parties.

Agency Cooperation of SFB Remediation

LADWP actively coordinates with the California Water Resources Control Board, DDW, LARWQCB, DTSC, and USEPA to pursue protective and remedial measures for the SFB. DDW, LARWQCB, and DTSC are the three regulatory agencies with enforcement responsibilities within the SFB. The LARWQCB and the DTSC issue enforcement directives for pollutant sites and guide the development of cleanup work plans and the cleanup of polluted groundwater sites. DDW oversees the quality of potable water from groundwater sources. USEPA administers the Superfund Program in SFB.

In 1987, LADWP entered into a Cooperative Agreement with the USEPA to conduct the "Remedial Investigation of Groundwater Contamination in the San Fernando Valley." Under this agreement, LADWP received funds from the USEPA's Superfund Program to carry out: (1) construction, operation, and maintenance of the NHOU consisting of a groundwater treatment facility and a system of eight production wells (construction completed in 1989), and (2) completion of the Remedial Investigation to characterize the SFB and the nature and extent of its groundwater contamination. The Remedial Investigation included: (a) 88 shallow and clustered monitoring wells to monitor contamination plumes of TCE, PCE, and nitrates in the SFB installed in 1992, (b) the development of a groundwater flow model (Flow Model) and the preparation of the Remedial Investigation report that was completed for the USEPA in 1992, and (c) on-going monitoring for TCE, PCE, nitrates, and emerging contaminants.

The Flow Model is a three-dimensional computer simulated model of the SFB based on the MODFLOW model program code that was developed by the United States Geological Survey. It consists of four layers that represent the various depth zones of the SFB. Geologic and hydrogeologic data for the basin, generated through field investigations, were analyzed to develop the physical site characterization of the basin for the MODFLOW Flow Model. The Flow Model produced simulated groundwater levels, gradients, and their fluctuations as a function of time. Based on field monitoring and Flow Model simulations, groundwater production strategies are reviewed and adjusted monthly to balance the City's water supply need with SFB management.

San Fernando Basin Groundwater Remediation Programs

In coordination with other agencies, LADWP has completed or is planning various projects to maintain the SFB as a reliable local water supply for the City. The following summarizes the various remediation programs LADWP is pursuing in the SFB.

Groundwater System Improvement Study (GSIS)

LADWP completed the 6-year, $11.5-million study in February 2015 that provides the basis for a comprehensive remediation and cleanup program to address groundwater contamination in the SFB.

One of the fundamental goals of the GSIS was to fill data gaps and provide a framework to collect data and assess overall groundwater quality in eastern SFB. The GSIS was executed as an iterative and dynamic study, whereby data gaps were identified, addressed, and then re-assessed.

The two primary data gaps identified during initial evaluation of available data included:

- Comprehensive water quality data to identify the chemicals of concern (COCs), including emerging and future contaminants, as identified by the DDW, as well as their distribution in groundwater in the eastern SFB
- Geophysical and hydrogeologic characteristics of the eastern SFB, specifically in areas of North Hollywood, Rinaldi-Toluca, and Tujunga Wellfields, required to update and refine the Hydrogeologic Conceptual Site Model (HCSM)

LADWP developed a monitoring well installation, sampling, and analysis program to fill these data gaps. The monitoring well installation, performed between 2013 and 2014, included the collection of the following data to assist with the development of the HCSM:

- Lithologic data collected through logging of soils by an onsite geologist and geophysical logging of the borehole. This information, along with data from adjacent wells, was also used to determine the appropriate screen intervals for the multi-level monitoring wells.
- Soil properties (e.g., soil bulk density, porosity and hydraulic conductivity) through geotechnical testing of select soil samples.
- Water quality samples collected at discrete depths in situ during advancement of the borehole and from the nested well casings after well completion.

Water quality data was collected from existing monitoring wells and production wells (a total of 67 wells sampled in 2012/2013) and 26 newly-installed multi-level nested monitoring wells (a total of 75 screen locations) were sampled during 2014. These sampling events included a comprehensive list of more than 400 chemicals that were analyzed.

Combining the data from the above mentioned monitoring events with water quality data from the historic record, a total of 93 chemicals were detected in the groundwater above a regulatory threshold at least once since water quality monitoring began in 1980. Only a portion of these chemicals pose a long-term risk to human health or the environment and require attention during the evaluation and design of remedial alternatives in the Draft Feasibility Study. To prioritize these COCs, each of the 93 chemicals was evaluated with respect to occurrence in the SFB and LADWP production wells, toxicity, and relation to regulatory thresholds and treatment requirements.

Using these criteria, a total of 12 COCs were identified as "high priority," which consist of the following:

- Organic Chemicals
    - TCE
    - PCE
    - Cis-1,2-Dichloroethene (cis-1,2-DCE)
    - 1,1-Dichloroethene (1,1-DCE)
    - 1,2-Dichloroethane (1,2-DCA)
    - Carbon tetrachloride
    - 1,2,3-Trichloropropane (1,2,3-TCP)
    - 1,4-Dioxane
    - NDMA
- Inorganic Chemicals
    - Cr(VI)
    - Perchlorate
    - Nitrate

The remaining chemicals were reported at least once above established regulatory limits but are considered lower priority. In fact, when treatment is considered, many will be addressed through treatment technologies for the high-priority COCs.

The Remedial Investigation Report summarizes investigative results from the GSIS as well as other data sources and updates the current conceptual understanding of the SFB. The report is an update to the 1992 Remedial Investigation Report for the San Fernando Valley because many of the findings from that report form the basis of the current HCSM model. The Remedial Investigation Update Report presents LADWP's latest understanding of the groundwater basin physical characteristics, nature and extent of contamination, fate and transport characteristics, and the contaminants' risk to human health and the environment.

With the completion of the Remedial Investigation Update and Draft Feasibility Study, LADWP will be able to proceed with the necessary environmental reviews, design, permitting, construction, and startup of the groundwater remediation facilities to effectively contain, clean, and remove contaminants from SFB.

Groundwater Remediation Facilities

North Hollywood Operable Unit: In 1989, the NHOU was placed into service with a design remediation capacity of 2,000 gpm (3,230 AFY); however actual capacity averages less than 1,300 AFY. This facility includes an aeration tower which forces air streams vertically through the tower against the downward flow of water to strip and remove VOCs from contaminated groundwater. The air stream ladened with VOCs continues along its path through a vapor-phase granular activated carbon (GAC) to remove VOCs from the air emissions before release to the atmosphere.

The NHOU was designed, constructed, and operated under supervision by USEPA pursuant to their consent decree with the Responsible Parties. This fifteen-year consent decree expired on December 31, 2004, however, the VOC contaminants have not been completely remediated from the targeted region of the basin. USEPA continues working with Responsible Parties and LADWP to implement the Second Interim Remedy (2IR) which has a targeted treatment capacity of 4,923 AFY. The 2IR will improve hydraulic containment of contaminant plumes, thereby protecting LADWP's nearby production wells, and add treatment technology capable of treating contaminants, such as Cr(VI) and 1,4-dioxane, that cannot be removed by the existing NHOU aeration tower.

USEPA amended its Record of Decision on January 10, 2014 adding re-injection of treated groundwater effluent as an equally preferred option for the 2IR. LADWP proposed an alternative Cooperative Containment Concept; if successfully negotiated among the parties, this concept will more than double the target treatment capacity to 10,500 AFY. Agreement on this concept will allow Responsible Parties to discharge treated groundwater into LADWP's drinking water system instead of re-injecting water back into the ground. Parties expect to conclude negotiations on the Cooperative Containment Concept and begin construction as early as 2018.

Pollock Wells Treatment Plant: Pollock Wells Treatment Plant was constructed with LADWP funds and placed into service in 1999. The plant treats groundwater pumped from two extraction wells using four liquid-phase GAC vessels at a total design flow of 3,000 gpm. The Pollock Wells Treatment Plant was designed to treat for TCE and PCE and restore a critical well field used to contain and reduce the loss of groundwater flowing out of SFB through Los Angeles River Narrows.

Temporary Tujunga Wellfield Treatment Study Project: Implemented May 2010, LADWP and MWD constructed the Temporary Tujunga Wellfield Treatment Study Project to install wellhead treatment on two of the 12 Tujunga water supply wells and test the effectiveness of coconut-based media for removing VOCs from groundwater. This project remediates contaminated groundwater using ten liquid-phase GAC vessels for each wellhead. To date, coconut-based GAC has proven to operate effectively. This facility provides remediation at a rate of up to 8,000 gpm (12,000 AFY). The capital cost of approximately $7.5 million was fully funded by LADWP and construction was completed in November 2009.

Groundwater Interconnection with City of Burbank Water and Power: LADWP and City of Burbank Water and Power (BWP) have partnered on a project to optimize use of the Burbank Operable Unit (BOU), a SFB groundwater remediation facility implemented in 1996. Currently, BOU operates near design capacity during hotter months of the year when water demands are high. During cooler months, the BOU must operate below design capacity due to low water demand. This project will enable BOU to operate at optimal flow rates for longer periods of each year to remediate and remove more contaminants from the groundwater basin. BWP will convey the additional treated groundwater into LADWP's system via a new interconnecting pipeline. BWP expects this project will enable remediation of as much as an additional 3,000 AFY of groundwater and remove an extra 1,500 pounds of contaminants annually from SFB. This project will also restore use of more local groundwater to the City of Los Angeles.

Expanded San Fernando Basin Remediation Strategies

Pursuant to recommendations provided by the Groundwater System Improvement Study, LADWP plans to implement comprehensive basin remediation at its three primary well fields in SFB: Tujunga, Rinaldi-Toluca and North Hollywood Wellfields. Concurrent with this strategy, LADWP has initiated studies to characterize groundwater in the southeast region of SFB surrounding Headworks, Pollock, Erwin, Whitnall, and Verdugo Wellfields. Results of this characterization study will provide the basis for implementation of additional basin remediation facilities.

LADWP will continue to investigate the utilization of various advanced and/or emerging groundwater treatment technologies for removal of contaminants such as VOCs, Cr(VI), 1,4-dioxane, nitrate, and perchlorate.

6.3 Sylmar and Eagle Rock Basins

The Sylmar Basin has provided as much as 3 percent of the City's local groundwater during the recent five-year period, providing as much as 1,952 AF during FY 2012/13, see exhibit 6B. The Sylmar Basin is located in the northern part of ULARA and spans 5,600 acres. This basin is bounded on the north and east by the San Gabriel Mountains; on the west by a topographic divide in the valley fill between the Mission Hills and the San Gabriel Mountains; and on the south by the Little Tujunga syncline, which separates it from the SFB.

LADWP's Mission Wellfield had a total of 7 wells constructed; two of which were constructed before 1961 and five of which were constructed between 1961 and 1977. Of these, only two remain operable; however one of these two wells have been removed from service due to groundwater contamination issues and may be demolished. The Mission Wells Improvement Project will install three replacement water supply wells and associated infrastructure. Phase I installation of a new water storage tank was completed in 2009. Phase II installation of the wells and treatment facilities is ongoing. Two off-site monitoring wells have also been installed to evaluate water quality near the well field. The three replacement wells are scheduled to be in service by 2016, thereby restoring LADWP's pumping capacity and ability to produce the City's annual water rights and stored water credits in the Sylmar Basin.

The Eagle Rock Basin is the smallest of the four basins and located in the southeast corner of ULARA spanning only 800 acres. Eagle Rock Basin is bounded by the San Rafael Hills on the north and west, by the Repetto Hills on the east and south, and a small alluvial area to the southeast consisting of a topographic divide. The safe yield of Eagle Rock Basin is derived from imported water delivered by LADWP, and there is no measurable native safe yield. LADWP has the right to produce the entire safe yield from the basin, but has not established groundwater production facilities in this basin. Currently, one private party pumps groundwater from Eagle Rock Basin and compensates the City for such pumping in accordance with the ULARA Judgment.

Groundwater Rights

Water rights in Sylmar Basin were originally established by the 1979 ULARA Judgment which recognized prior overlying rights of two private land owners and appropriative rights of the cities of San Fernando and Los Angeles. This Judgment also recognized the cities' rights to store water within the basin and recapture Import Return Water, calculated as 35.7 percent of imported water delivered. On August 26, 1983, the ULARA Watermaster reported to the Los Angeles Superior Court that Sylmar Basin was in a condition of overdraft. In response, the Los Angeles Superior Court signed the 1984 Stipulated Agreement limiting total pumping to 6,210 AFY, divided equally between the two cities. In 1996, ULARA Watermaster recommended and ULARA Administrative Committee approved increasing the safe yield to 6,510 AFY for a ten-year period. In 2006, ULARA Watermaster re-evaluated the safe yield and recommended a subsequent increase to 6,810 AFY, which the Los Angeles Superior Court approved subject to various conditions. Conditions included requiring the two cities to install groundwater monitoring wells to assist in determining basin outflows used to evaluate basin storage capacity. In 2012, ULARA Watermaster completed an updated re-assessment of safe yield which resulted in a temporary and conditional increase in safe yield to 7,140 AFY, allowing each City the right to produce 3,570 AFY. Court approved this new stipulated Agreement which will expire upon conclusion of the 2015-16 water year.

Stored water credits accumulated in the basin are determined by the Watermaster pursuant to ULARA Judgment and subsequent stipulations. As of October 1, 2013, the City has accrued 9,014 AF of stored water credits in the Sylmar Basin.

Water Quality

Groundwater quality issues in the Sylmar Basin related to TCE contamination has impaired one of the two remaining production wells at LADWP's Mission Wellfield. TCE has also been detected in trace amounts in the second well. LADWP has removed the impaired well from service to ensure groundwater produced from the well field surpasses State and Federal safe drinking water standards. Recently installed replacement wells have shown the presence of hexavalent chromium, or Cr(VI), detected at trace levels, and TCE above the MCL in one of the three wells. LADWP anticipates that well field blending will be sufficient to ensure Cr(VI) concentrations remain below the State MCL of 10 parts per billion (ppb). Evaluations are underway to determine the need for remediation systems to fully address TCE contamination at this well field.

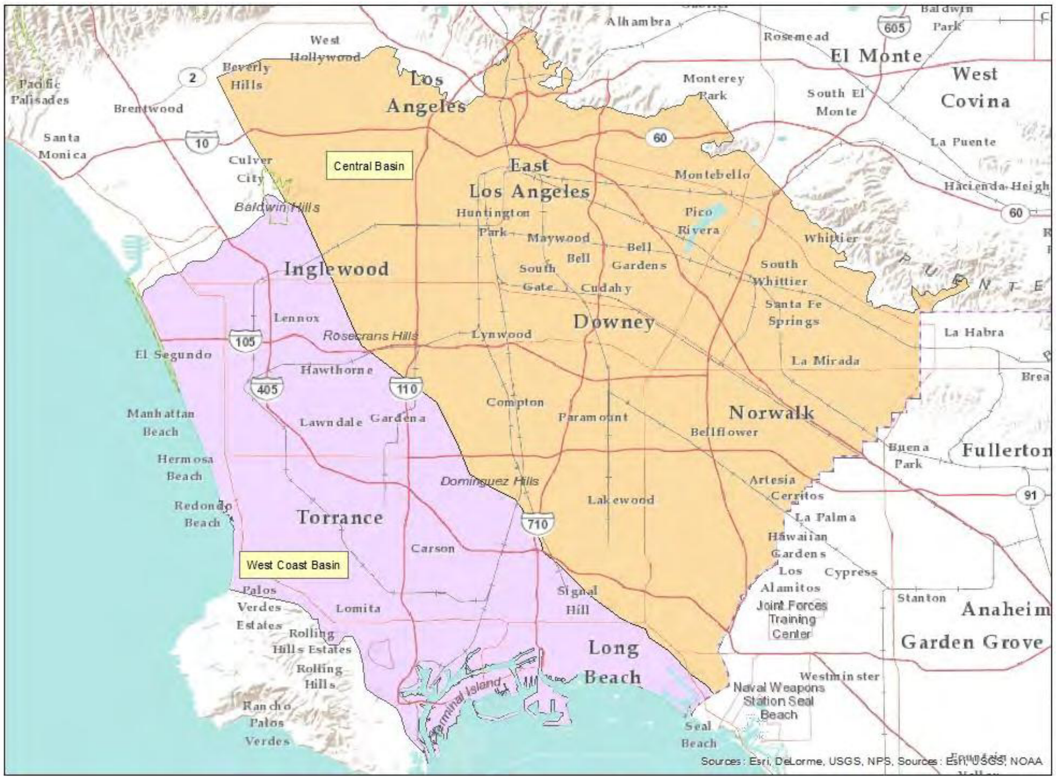
6.4 Central Basin

Over the recent five-year period, the Central Basin has provided as much as 15 percent of the City's local groundwater supply ranging from 5,099 AF to 9,727 AF through two well fields, see exhibit 6B. Known as sub-basin number 4-11.04 in DWR Bulletin 118, the Central Basin Watermaster service area overlies about 227 square miles of the Central Basin in the southeastern part of the Los Angeles Coastal Plain in Los Angeles County as depicted in Exhibit 6D. The Central Basin Watermaster service area is bounded by the Newport-Inglewood Uplift on the southwest, the Los Angeles-Orange County line on the southeast, and an irregular line that approximately follows Stocker Street, Martin Luther King Boulevard, Alameda Street, Olympic Boulevard, the boundary between the City of Los Angeles and unincorporated East Los Angeles, and the foot of the Merced and Puente Hills on the north. Twenty-three incorporated cities and several unincorporated areas are within the Central Basin Watermaster service area.

Groundwater within the basin provides a large portion of the water supply needed by overlying residents and industries. Central Basin Watermaster Service Report for FY 2013/14 indicates 131 parties with rights to groundwater in the Central Basin.

LADWP produces Central Basin groundwater from the Manhattan and 99th Street Wellfields. Six production wells were installed at the Manhattan Wellfield between 1928 and 1974, and two active wells remain with a production capacity of 7.0 cfs. Production wells were installed at the 99th Street facility between 1974 and 2002 and the remaining four active wells have a production capacity of 6.1 cfs. The 99th Street wells are newer and have relatively little mechanical or other problems. The Manhattan wells are approaching the end of their useful life and have experienced water quality issues and mechanical deterioration which has limited their capacity. To restore pumping capacity in Central Basin, LADWP is implementing the Manhattan Wells Improvement Project, discussed in detail on the succeeding section.

Exhibit 6D Central Basin



Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA

Groundwater Rights

Beginning over 50 years ago, groundwater overdraft and declining water levels in Central Basin threatened the area's groundwater supply and caused seawater intrusion in the southern part of Central Basin. However, timely legal action and adjudication of the water rights halted the overdraft and prevented further damage to Central Basin. Today, groundwater use in Central Basin is restricted to Allowed Pumping Allocations set by Superior Court Judgment and is monitored by a court-appointed Watermaster. The Central Basin Judgment was amended in December 2013 and major changes include new provisions to allow parties to augment and store groundwater, and to appoint a new Watermaster Panel. The Watermaster consists of three separate arms with different functions. The first arm is the Administrative Body, to administer the Watermaster accounting and reporting functions. This role is performed by the Water Replenishment District of Southern California (WRD). The second arm is the Central Basin Water Rights Panel (CBWRP), which enforces issues related to pumping rights defined in the adjudication. The CBWRP is made up of seven water rights holders who are selected through election. The third arm is the Storage Panel, which is comprised of the CBWRP and the WRD Board of Directors. Annually, the Watermaster prepares a Watermaster Service Report indicating groundwater extractions, replenishment operations, imported water use, recycled water use, finances of Watermaster services, administration of the water exchange pool, and significant water-related events in the Central Basin.

The City's entitlement in the Central Basin of 15,000 AFY was established by judgment of the Superior Court of the State of California for the County of Los Angeles through the Central Basin Judgment (Case No. 786,656 – third amended judgment). The City purchased additional pumping rights in 2014 and 2016 in three separate transactions, bringing the total annual pumping right in the Central Basin to 17,236 AF. The City has also utilized the new storage provisions allowed under the third amended judgment, and has accrued 6,020 AF of stored water in the Central Basin (Central Basin Watermaster Service Report, FY 2014/15). In addition to its annual entitlement, the Central Basin Judgment allows for carryover of unused water rights, up to a maximum of 40 percent of the purveyor's pumping allocation for FY 2014/15. This carryover percentage will increase annually by 10 percent until reaching its final level of 60 percent. The Central Basin Judgment also allows for over extraction of an additional 20 percent under emergency situations that would be debited against the purveyor's following year entitlement. The City can use its carryover storage right for operational flexibility and conjunctive use. Combined with previously accrued emergency storage, the City's groundwater in storage is 11,270 AF into FY 2015/16.

Water Quality

Although the Manhattan and 99th Street Wellfields in the Central Basin are located approximately 4 miles apart, there is a significant variation in water quality between the facilities. Two of the six Manhattan wells have been impaired by contamination exceeding the MCL of 5 ppb for TCE. Wellfield blending was not sufficient to allow continued operation of these impaired wells which showed TCE concentrations as high as 20 ppb, requiring that these wells be removed from service. The two remaining wells have also shown TCE detected at trace levels below the MCL. The impaired wells, along with two other mechanically deteriorated wells, have been demolished. Four replacement production wells have been installed at Manhattan Wellfield and test results have demonstrated that improved water quality can be produced from these wells. LADWP will continue to manage and operate the wellfields in such a way that ensures groundwater quality complies with State and Federal safe drinking water standards.

Groundwater produced from 99th Street Wellfield does not currently show detection of any industrial contaminants above the MCLs; however, two naturally occurring constituents, manganese and iron, exceed secondary MCLs, requiring treatment to comply with safe drinking water standards. These two constituents do not pose a risk to human health, but at existing concentrations they do affect the aesthetic qualities of the groundwater such as taste, color, and odor. LADWP's application of zinc orthophosphate, via corrosion control treatment, acts as a sequestering agent. Additionally, sodium hypochlorite oxidizes manganese, and both of these treatments provide effective water quality control for manganese and iron. Hydrogen sulfide is also present, but with chlorination, it does not pose an imminent threat to the reliability of this well supply.

Manhattan Wellfield Improvement Project: The Manhattan Wellfield Improvement Project (MWIP) was initiated to restore the pumping capacity of the Manhattan Wellfield and to produce the City's annual entitlement to groundwater in the Central Basin plus accumulated groundwater storage credits. The project will reduce the City's reliance on imported water purchased from MWD and thereby reducing LADWP's cost of procuring water by approximately $2 million per year.

Wells and infrastructure at Manhattan Wellfield date to the 1920s. A number of wells have been decommissioned largely due to age and corrosion resulting in casing failures and sand intrusion as well as contaminant plumes impacting the local water quality. The MWIP proposes to rehabilitate and/or construct up to two groundwater monitoring wells and up to eight groundwater production wells and related facility infrastructure, including well collector and discharge lines, electrical upgrades and SCADA controls.

As of April 2015, the MWIP has been accelerated in order to obtain $3M in Proposition 84 Integrated Regional Water Management State Grant funding. Construction of the first new monitoring well started in July 2014 and MH-MW-01 was completed at the end of February 2015. Construction of the replacement production wells began in October 2014. Piping designs have been approved and on-site improvements began in late December 2014. Electrical designs are undergoing review. Delivery of well pumps is expected by summer 2016 when production well and piping construction is completed. Per the Grant Funding Agreement, the well field is to be on-line by late 2016.

Wellfield No. 3 Feasibility Study and Site Investigations: It is anticipated that additional water rights will be purchased or leased, and stored groundwater will continue to accumulate. While planned improvements at the Manhattan Wellfield will significantly increase production, additional capacity will be needed to utilize the City's entire annual water rights including stored groundwater.

LADWP is evaluating the feasibility of establishing additional extraction facilities in the Central Basin. The study assesses existing and forecasted groundwater supplies, potential environmental impacts of a new well field construction and operation, potential sites for well field development, and economic cost/benefit analysis. Additionally, LADWP has plans to construct two monitoring wells in the Central Basin to further evaluate hydrogeology, groundwater quality, and well performance. Early study results anticipate a 5,000 AFY design production capacity, with a 15,000 AFY expansion option.

6.5 West Coast Basin

Due to localized groundwater contamination issues and deterioration of water quality, LADWP discontinued operating its Lomita Wellfield and has been unable to pump its entitlement from the West Coast Basin since 1980. Referred to as sub-basin number 4-11.03 by DWR Bulletin 118, the West Coast Basin underlies 160 square miles in the southwestern part of the Los Angeles

Coastal Plain in Los Angeles County. The West Coast Basin is bounded on the west by Santa Monica Bay, on the north by Ballona Escarpment, on the east by the Newport-Inglewood Uplift, and on the south by San Pedro Bay and the Palos Verdes Hills. Twenty incorporated cities and several unincorporated areas overlie the West Coast Basin (West Coast Basin Watermaster Service Report, FY 2013/14).

Groundwater Rights

In 1945, when intrusion of seawater caused by declining water levels threatened the quality of the groundwater supply, legal action was taken to halt the overdraft and prevent further damage to the West Coast Basin. In 1955, the Superior Court of Los Angeles County appointed DWR as the Watermaster to administer an Interim Agreement. In 1961, the Court retained DWR as the Watermaster of the Final West Coast Basin Judgment (Case No. 506,806 – amended judgment). Similar to the Central Coast Basin, an annual Watermaster Service Report is prepared. The West Coast Basin Judgment affirmed the City's right to produce 1,503 AFY of groundwater from this basin.

In 2014, the West Coast Basin Judgment was amended in a manner similar to the Central Basin Judgment. The new Watermaster for the West Coast Basin also consists of the Administrative Body (handled by WRD, as in the Central Basin), West Coast Basin Water Rights Panel, and Storage Panel. Parties will also be able to store specified quantities of water in the West Coast Basin, and certain parties (including the City) are able to pump unused West Coast Basin rights out of the Central Basin, per the Central Basin Judgment.

Water Quality

Groundwater quality problems in the West Coast Basin were previously related to high levels of total dissolved solids (TDS), hydrocarbons, and chlorides. LADWP halted operations in the basin in September of 1980 with closure of the Lomita Wellfield, and intends to study the feasibility and cost of restoring groundwater pumping.

6.6 Antelope Valley Groundwater Basin

The City has entitlements to pump 3,975 AF of native groundwater from Antelope Valley Groundwater Basin (AVGB) and to store water it imports into the basin for future export. Utilization of the basin to meet city water demand will be limited to supplies imported and stored in the AVGB. Native safe yield entitlements may only be used locally within the basin. However, water imported and stored in the AVGB can be exported for use in the City. Known by DWR Bulletin 118 as sub-basin number 6-44, the AVGB underlies 1,580 square miles of an extensive alluvial valley in the western Mojave Desert. The elevation of the valley floor ranges from 2,300 to 3,500 feet above sea level. The basin is bounded on the northwest by the Garlock fault zone at the base of the Tehachapi Mountains and on the southwest by the San Andreas fault zone at the base of the San Gabriel Mountains. The basin is bounded on the east by ridges, buttes, and low hills that form a surface and groundwater drainage divide and on the north by Fremont Valley Groundwater Basin at a groundwater divide approximated by a southeastward-trending line from the mouth of Oak Creek through Middle Butte to exposed bedrock near Gem Hill, and by the Rand Mountains farther east.

Total groundwater storage capacity in AVGB is reported to be between 68 million acre-feet (MAF) (Planert and Williams 1995) and 70 MAF (DWR 1975). For the shallow section of the basin between 20 and 220 feet below ground surface, the storage capacity is reported to be 5.4 MAF (Bader 1969). However, the AVGB has a documented history of declining groundwater levels resulting in land subsidence and adverse effects to overlying land caused by excessive groundwater pumping. Much of the AVGB supported extensive agricultural production in the early part of the twentieth century followed by a shift towards rapid urbanization during the latter part of the century. The shift brought about renewed demand for groundwater, which resulted in a dramatic decrease in groundwater levels.

Groundwater Rights

Declining groundwater levels and concerns about the availability of groundwater became more pronounced as public water suppliers increased pumping for municipal supply. Litigation over Antelope Valley groundwater rights began in October 1999 with certain private land owners filing complaints and public water suppliers responding with cross-complaints. In August 2005, the various actions were consolidated into the Antelope Valley Groundwater Cases which continued under the Santa Clara County Superior Court supervised by the Honorable Jack Komar. Overlying landowners collectively have the paramount right to native groundwater and public water suppliers have claimed prescriptive rights against the landowners. The City of Los Angeles has standing in this litigation as one of the overlying landowners in the basin.

During the 1960s and 1970s, the City, by and through Los Angeles World Airports (LAWA), acquired approximately 27 square miles of land in Antelope Valley for the purpose of developing an international airport in Palmdale. LAWA has leased their properties to tenants using the land for agricultural production, which has been supported by groundwater pumping and use of treated effluent supplied by Los Angeles County Sanitation District No. 20.

After more than a decade of litigation, four trial phases, and various attempts to comprehensively adjudicate the water rights, litigation concluded on December 23, 2015 with Judge Komar signing the Antelope Valley Groundwater Adjudication settlement. The Court determined the native safe yield as 82,300 AFY and total safe yield inclusive of import return flows as 110,000 AFY. The United States government asserted a paramount federal reserved right to 11,000 AFY for Edwards Air Force Base. The Court found the basin to be in overdraft since at least 1951 and has estimated current pumping at between 130,000 and 150,000 AFY. The City's entitlement to pump 3,975 AFY may only be used on LAWA land in the Antelope Valley. Settlement provisions also allow parties to carryover and store unused annual entitlements in AVGB, and ability to transfer entitlements (purchase/sell) between parties in the Antelope Valley. The City's right to store imported water in AVGB allows for later recovery and export to the City, subject to any irretrievable losses that may be determined by the Watermaster.

The City's annual entitlement to native groundwater may be useful for LAWA's future development of an international airport in Palmdale since the native groundwater may be used only on overlying land. The right to store imported water is of broader interest to LADWP. This would allow LADWP to import water from various sources such as the Eastern Sierra for example, temporarily store these supplies within the AVGB, and recover the water for export to Los Angeles at times when it is necessary to manage seasonal peak demand or augment supplies during dry periods, emergencies, or natural disaster. The LAA and State-owned California Aqueduct are facilities which may be used to convey imported supplies into AVGB for storage. Additional facilities, such as percolation basins or injection wells, are necessary to physically place water into storage. Pumping facilities are also needed to recover stored water from AVGB for conveyance to the City. Agencies who own storage and extraction facilities may become potential partners to facilitate the City's use of underground storage in AVGB.

Water Quality

AVGB groundwater quality typically contains calcium bicarbonate where the basin approaches the surrounding mountains, and sodium bicarbonate or sodium sulfate near the central part of the basin (Duell 1987). In the eastern part of the basin, the upper aquifer contains sodium-calcium bicarbonate, while the lower aquifer contains sodium bicarbonate (Bader 1969). TDS averages 300 milligrams per liter (mg/L), ranging from 200 to 800 mg/L (KJC 1995). High levels of boron and nitrates have also been observed in the basin (KJC 1995). Based on water quality data reported to the State, concentrations detected in certain wells have exceeded the MCL for inorganics, radiological constituents, nitrates, and/or VOCs/SVOCs.

6.7 Sustainable Groundwater Management Act (SGMA)

Amidst a multiple year drought, California is challenged with several statewide water shortage issues, including over pumping which results in land subsidence and dry well issues. In response to the current drought, Governor Jerry Brown and the State Legislature enacted the SGMA which took effect on January 1, 2015. With SGMA, the State focused upon equipping and empowering local agencies with tools needed to manage local groundwater basins in a sustainable manner. Actions necessary to achieve sustainability will vary with each basin, but SGMA generally requires local agencies to form Groundwater Sustainability Agencies (GSAs), develop and implement Groundwater Sustainability Plans (GSPs), and monitor and report status of groundwater conditions within each basin. By enacting the new law the State seeks to mitigate and prevent the occurrence of adverse effects caused by unreasonable use of groundwater, such as groundwater storage depletion, land subsidence, seawater intrusion, water quality degradation, critical overdraft basin conditions, and surface water depletions.

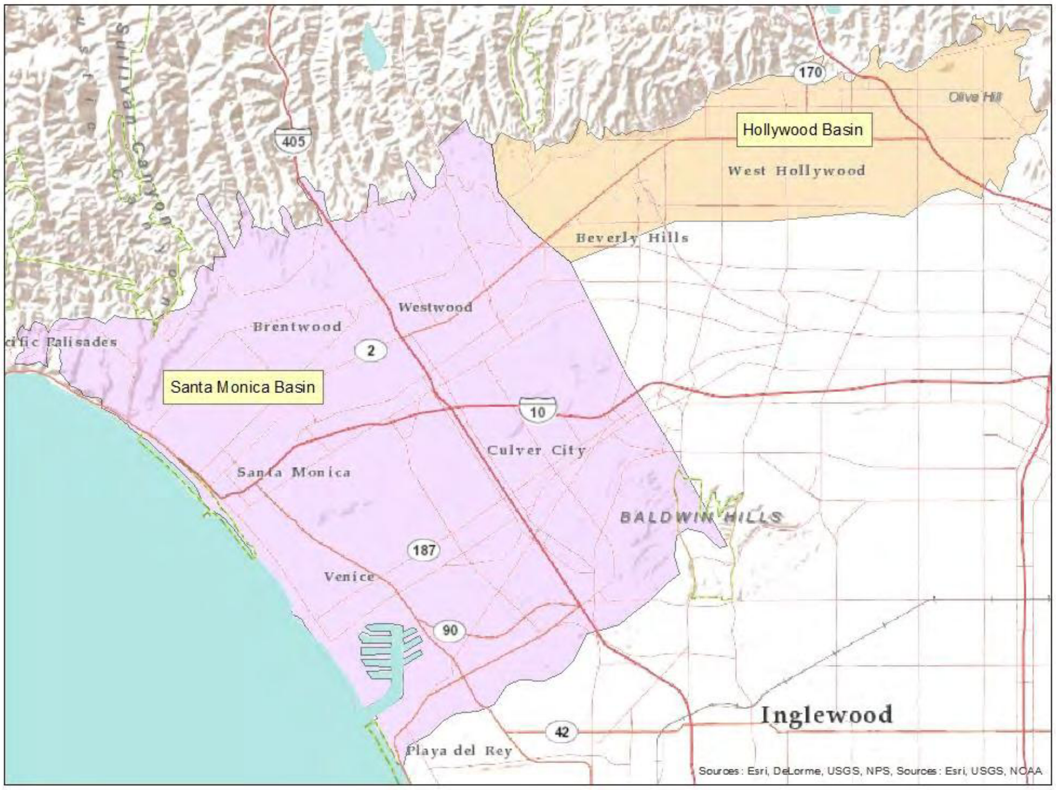
The State has made funding and technical assistance available to ensure local agencies can implement SGMA successfully. Agencies who fail to comply will risk having their basin(s) being placed on probationary status which authorizes the State to step in and implement SGMA on their behalf. Advancing guidelines for the SGMA, DWR is developing its Strategic Plan for a Sustainable Groundwater Management (SGM) Program. DWR's SGM Program will implement the new and expanded responsibilities identified in SGMA. Some of these expanded responsibilities include: (1) developing regulations to revise groundwater basin boundaries, (2) adopting regulations for evaluating and implementing GSPs and coordination agreements, (3) identifying basins subject to critical conditions of overdraft, (4) identifying water available for groundwater replenishment, and (5) publishing best management practices for the sustainable management of groundwater.

Throughout the development of SGMA, there was broad public consensus that adjudicated basins are well managed, subject to Court jurisdiction, and should not be the primary focus for SGMA. Therefore, the new law only requires managers of adjudicated basin to file a copy of the adjudication with DWR and the annual reports which document basin conditions. Los Angeles overlies both adjudicated and unadjudicated basins; therefore LADWP will work with its regional partners towards implementing SGMA for the unadjudicated basins that are located within the City's boundaries.

6.8 Unadjudicated Basins

The Central and West Los Angeles areas of the City overlie the Hollywood Basin, Santa Monica Basin, and the northerly area of Central Basin located outside

Exhibit 6E
Hollywood and Santa Monica Basins



Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA

of the adjudicated basin boundary. The unadjudicated Hollywood and Santa Monica Basins are depicted in Exhibit 6E. Although the potential for utilizing these basins for groundwater supply may present certain challenges related to water quantity and quality, the call by City leaders to increase use of local resources has prompted a renewed view towards all of the City's groundwater assets including potential supplies from these basins. Therefore, LADWP anticipates developing groundwater resources in a manner that is locally sustainable and in cooperation with its regional partners in each of the basins.

With the passing of the SGMA, cities with overlying land in unadjudicated basins are mandated to sustainably manage their respective basins, particularly those considered by the State to be of medium or high priority. While Hollywood Basin is considered to be a low priority basin, Santa Monica Basin is considered a medium priority basin. Per regulatory guidelines, a Groundwater Sustainability Agency must be established by June 30, 2017, and a GSP must be established by January 31, 2020. This also applies to the unadjudicated northern area of Central Basin, a high priority basin. LADWP plans to move forward in collaborating with municipalities and agencies overlying these basins to comply with the SGMA.

6.9 Water Quality Goals and Management

The groundwater management efforts that LADWP has undertaken resulted in all groundwater delivered to LADWP customers meeting or exceeding all DDW water quality regulations. As part of its regulatory compliance efforts, LADWP works with the DDW to perform water quality testing on production and monitoring wells.

Groundwater Monitoring

Every well that is pumped to supply water to the City is actively monitored by LADWP as required by DDW. LADWP's groundwater monitoring program is comprised of several distinct components. These components include the monitoring of metals (Hexavalent Chromium and lead), coliform bacteria, inorganics, VOCs, unregulated compounds such as vanadium, boron, and disinfection by-products. The frequency and level of monitoring (i.e., annually, quarterly, or monthly) depends on the level of contamination found in each well. Monitoring for all contaminants is performed in close proximity to where the water is being pumped from the wells, typically the blend point. If water quality problems are detected, the well source is immediately isolated and retested. LADWP conducts extensive field and laboratory tests throughout the year for hundreds of different contaminants to ensure that they are well within the safe levels before serving water to customers.

Operating Goals

LADWP has established operating goals for TCE, PCE, nitrates, perchlorate, and total chromium that are more stringent than the MCLs permitted by Federal or State regulations. These stricter operational goals provide an additional safety margin from these contaminants for City customers. Exhibit 6F summarizes these water quality goals and compares them with the State-regulated requirements, which are generally more stringent than Federal requirements.

TCE and PCE compounds are commonly used in industries requiring metal degreasing such as automotive, aerospace, and fabrication. PCE was commonly used in dry cleaning and automotive repair industries.

Nitrate is a concern because of its acute effect on infants, who are most sensitive to nitrate's effect of reducing the uptake of oxygen to the blood. The current standard for nitrate is 45 parts per million (ppm). A single exceedance of the nitrate standard is classified as an acute violation requiring immediate public notification. Treatment for nitrates may eventually become necessary for affected City groundwater supplies.

In October 2007, an MCL was adopted for perchlorate of 6 ppb. Perchlorate is an inorganic compound that is commonly used in the manufacture of rocket fuels, munitions, and fireworks.

Exhibit 6F
Operating Limits of Regulated Compounds

Compound	State of California Limit	LADWP Operational Goals (ppb)	LADWP Added Factor of Safety
Trichloroethylene (TCE)	5 ppb	3 ppb	40%
Perchloroethylene (PCE)	5 ppb	3 ppb	40%
Nitrate (N03)	45 ppm	30 ppm	33%
Perchlorate (CI04)	6 ppb	4 ppb	33%
Hexavalent Chromium (Cr(VI))	10 ppb	6 ppb	40%
Total Chromium	50 ppb	30 ppb	40%

99th Street Wellfield

Managing Emerging Contaminants of Concern

LADWP addresses emerging contaminants on many levels: 1) by encouraging the development of standardized testing to enable early detection and supporting the regulatory framework by providing early occurrence data, 2) by advocating good science and a balanced approach to risk assessment, 3) by seeking to gain a risk perspective with other existing contaminants to manage the emerging contaminants in the absence of regulations, 4) by supporting early interpretation of emerging contaminants in collaboration with research and regulatory agencies, and 5) by supporting the research to develop cost-effective treatment for the removal and management of these emerging contaminants.

The response to Cr(VI) is an example of how LADWP addresses an emerging contaminant. Prior to 2014 Cr(VI) did not have an enforceable drinking water standard. However, Cr(VI) was included in the State total chromium standard of 50 ppb. Chromium is a heavy metal that has been used in industry for various purposes including electroplating, leather tanning, and textile manufacturing, as well as controlling biofilm formation in cooling towers. LADWP began low level monitoring of Cr(VI) long before monitoring was required by regulators. LADWP supported new health-effects research needed to support risk assessment and advocated a balanced approach to risk management. LADWP funded research to develop new treatment technologies to reduce Cr(VI) detection levels. In April 2014, an MCL for Cr(VI) of 10 ppb was established by the State and became effective on July 1, 2014.

An increasing number of LADWP's North Hollywood wells have contamination of 1,4-dioxane above the 1 ppb Notification Level set by the USEPA. Several of LADWP's North Hollywood wells were removed from service due to the increasingly compromised water quality and critical need for plume management. Presently, there are no treatment systems installed on these wells and thus LADWP is losing their use of these wells for the foreseeable future. To make up this loss, LADWP will have to replace this water with imported water purchased from MWD.

Most recent among emerging contaminants are pharmaceutically active compounds and personal care products that are emerging in rivers, lakes, and waterways from urbanized areas. Concerns exist regarding the occurrence and effects of endocrine disrupters, hormone-shifting compounds, and pharmaceuticals. Technology now allows the detection of compounds down to the parts per trillion levels, thus some of these previously invisible compounds are now being detected in water supplies. The risk assessment sector is having difficulty keeping pace with rapid advances in analytical detection technology. The question of what health risks these contaminants pose at low levels needs more investigation. LADWP will continue to proactively address emerging contaminants through early monitoring and utilization of a balanced approach to risk management.

LADWP will be incorporating appropriate treatment processes into future groundwater treatment facilities. LADWP has and will continue to solicit input from stakeholders to properly plan and develop processes for removal and treatment of emerging contaminants. LADWP's Recycled Water Advisory Group is an example of ongoing efforts to solicit input.

6.10 Groundwater Pumping Cost

Exhibit 6G graphically illustrates LADWP's annual unit-cost to produce local groundwater for the City over the previous 21 years. Costs include operating and maintaining water well pumps, conveyance piping, disinfection treatment systems, electrical services, associated repairs, annualized depreciation of fixed infrastructure, and related financing and overhead costs. Payments of groundwater replenishment fees to an outside agency are also included. Other related costs were recently recognized and are now being incorporated into this analysis beginning with Fiscal Year 2010-11; these

Exhibit 6G
Historical Cost of Groundwater Pumping

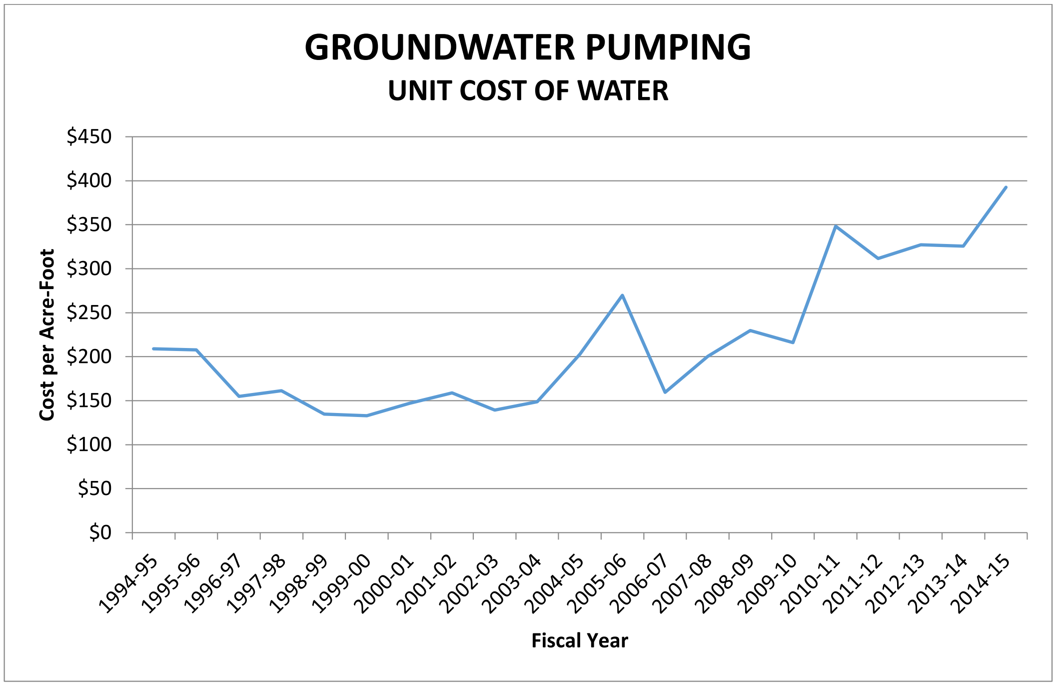


Exhibit 6H
Annual Unit Cost ($/AF)

Fiscal Year	2010/11	2011/12	2012/13	2013/14	2014/15
Unit Cost	$348	$312	$327	$326	$392

related costs include pressurization of groundwater to service pressure, payment of fees to the Court-appointed Watermasters, and groundwater planning and management services. Exhibit 6H tabulates annual unit costs for the recent five year period, and the five-year average is $341 per acre-foot.

6.11 Groundwater Production Forecast

Exhibit 6I presents LADWP's forecast for groundwater production from each basin through fiscal year ending June 30, 2040. The projection accounts for projects that restore capacity of LADWP's existing well fields and the implementation of expanded basin remediation in San Fernando Basin. Although excluded from the figures provided, LADWP anticipates pumping additional volumes in conjunction with enhanced groundwater recharge and replenishment using stormwater and purified recycled water as presented in Chapter 7: Watershed Management and in Chapter 4: Water Recycling. Please see the respective chapters for water supply forecasts associated with these related activities.

LADWP utilizes various strategies to respond to dry period conditions when surface water supplies become diminished. Historically, LADWP has operated its groundwater resources conjunctively with surface water supplies by reducing pumping during wet periods when more surface water can be used for municipal supply and increasing pumping during dry periods to compensate for reduced availability of surface water supplies. This strategy allows for greater replenishment to the local groundwater basins during wet and normal periods, and prevents conditions of severe overdraft when groundwater pumping is increased during dry periods.

The various water rights judgments also enable conjunctive use strategies through provisions allowing water rights holders to pump less than their annual entitlements and accumulate groundwater into storage. Parties may then produce this stored groundwater in subsequent years, such as during dry periods for example. Certain provisions of the water rights judgments also allow temporary increases in pumping while requiring equivalent reductions in pumping in subsequent years. This provides flexibility for parties who may have no accumulated groundwater in storage. LADWP utilizes these judgment provisions and has accumulated stored groundwater within each of its operating basins to provide supplemental water during dry periods, natural disasters, and emergencies.

Exhibit 6I
Groundwater Production 2014/15 to 2039/40 for all Weather Conditions

Basin	**2014/15 (Actual)**	**2019/20**	**2024/25**	**2029/30**	**2034/35**	**2039/40**
	AFY					
San Fernando[1]	80,097	90,000	88,000	84,000	92,000	92,000
Sylmar[2]	0	4,170	4,170	4,170	4,170	3,570
Central[2]	6,948	18,500	18,500	18,500	18,500	18,500
Total	87,045	112,670	110,670	106,670	114,670	114,070

[1] SFB remediation facilities are expected to be in operation in FY 2021/22. Use of groundwater storage credits allows for increased pumping above safe yield.

[2] Use of groundwater storage credits in Sylmar Basin and Central Basin allows for temporary increase in pumping above safe yield until stored water credits have been expended.

Chapter Seven

Watershed Management

Hansen Spreading Grounds

7.0 Overview

Stormwater runoff from urban areas is an underutilized local water resource. Within the City of Los Angeles, the majority of stormwater runoff is directed to storm drains and ultimately channeled into the ocean. This unused stormwater carries many pollutants that are harmful to marine life and public health. In addition, local groundwater aquifers that should be replenished by stormwater are receiving less recharge than in the past due to increased urbanization. Urbanization has increased the City's hardscape, which has resulted in less infiltration of stormwater and a decline in groundwater elevations.

In response, LADWP's Watershed Management Group was created in January 2008 to develop and manage the water system's involvement in emerging issues associated with local and regional stormwater capture. The Watershed Management Group coordinates activities with other agencies, departments, stakeholders and community groups for the purpose of planning and developing projects and initiatives to improve stormwater management within the City. The Group's primary goal is to increase stormwater capture by expanding centralized stormwater capture facilities and promoting distributed stormwater infiltration and reuse systems. Achieving this goal will help the City achieve its long-term strategy of enhancing local water supply through stormwater capture, in coordination with Mayor Eric Garcetti's Executive Directive No. 5 and the City of Los Angeles Sustainable City pLAn. While working to increase stormwater capture for improved long-term groundwater reliability, other watershed benefits can also be achieved including increased water conservation, improved water quality, open space enhancements, wildlife habitat, flood control, and social/economic benefits.

LADWP's Stormwater Capture Master Plan (SCMP), which was completed in August 2015, comprehensively evaluated stormwater capture potential within the City. This 2015 Urban Water Management Plan (UWMP) utilized the SCMP as the basis for quantifying stormwater that could be captured for local water supply benefits. Stormwater capture can be achieved by increasing infiltration into groundwater basins (i.e., groundwater recharge) and by onsite capture and reuse of stormwater for landscape irrigation (i.e., direct use). Conservatively, additional stormwater capture projects will increase groundwater recharge by 66,000 AFY and direct use by 2,000 AFY, using both centralized and distributed projects and programs. A conservative estimate of total stormwater capture potential in 2035 is 132,000 AFY, which includes both existing and additional new stormwater capture. Under a more aggressive approach total stormwater capture potential in 2035 could be up to 178, 00 AFY.

As mentioned above, urbanization encroached onto historical waterway floodplains resulting in channelization of these waterways, which once recharged the San Fernando Basin (SFB) groundwater aquifers with large volumes of stormwater runoff. As these floodplains were undergoing rapid development, LADWP and the Los Angeles County Flood Control District (LACFCD) reserved several parcels of land for use as stormwater spreading facilities. These facilities are adjacent to some of the largest tributaries of the Los Angeles River, and the Pacoima and Tujunga Washes.

During average and below average years, these spreading facilities are very effective at capturing a large portion of the stormwater flowing down the tributaries. However, storm flows during wet and extremely wet years exceeds the capacity of these facilities. Weather patterns in Los Angeles are highly variable, with periods of both dry years and wet years. Some climate studies predict that these patterns may become more extreme in the future. The SCMP identified future centralized projects to capture an additional 35,000 AFY to 51,000 AFY by 2035, based on a conservative or aggressive approach, respectively.

Furthermore, a significant portion of the watershed is not located adjacent to large tributaries, and therefore cannot be served by existing spreading facilities. These areas are the urbanized low-lying flatlands where stormwater runoff typically accumulates. Therefore, the SCMP identified a strategy to develop and implement distributed stormwater infiltration solutions. These distributed solutions include widespread, smaller projects at the neighborhood scale and landscape changes at the individual parcel scale. The SCMP identified future distributed infiltration and direct use projects, programs and policies to capture an additional 33,000 AFY to 63,000 AFY by 2035, based on conservative or aggressive approach, respectively.

With ever-increasing attention being placed on stormwater capture, other challenging conditions beyond imperviousness and changing climate patterns have been identified. These challenges include aging spreading facilities, landfills adjacent to spreading facilities, floodplain encroachment, substructure impacts, and other man-made conditions that limit the ability to capture stormwater for later use. Solutions exist for many of these challenges. For example, the aging delivery systems at the spreading facilities can be retrofitted with new gates and telemetry. Other conditions, such as the presence of large sanitary landfills adjacent to spreading facilities, are more difficult to rectify.

With increasing pressure on traditional water resources, LADWP is undertaking a significant effort to augment its local water supply portfolio with increased stormwater capture. This effort aligns with LADWP's mission of providing safe, reliable, and environmentally sensitive water supply for the City of Los Angeles.

7.1 Importance of Watershed Management to Groundwater Supplies

Managing native stormwater is a necessary step towards maintaining a healthy groundwater basin. Urbanization and its associated increase in impervious surfaces has altered the natural ability of stormwater to replenish local groundwater aquifers. Stormwater systems in the City were designed primarily for flood control to convey stormwater runoff to the Pacific Ocean as quickly as possible, thereby minimizing the potential for flooding while maximizing the land area available for development. Within LADWP's service area, the SFB is the most receptive to regional stormwater capture and recharge through spreading basins because of its predominantly sandy soils. However, stormwater that once percolated into groundwater is now being channeled across impervious surfaces and through concrete-lined channels to areas outside the San Fernando Valley. Several other groundwater basins within LADWP's service area may provide varying levels of opportunities for development of stormwater capture. These basins include: Central Basin, West Coast, Hollywood Basin, Santa Monica Basin, Main San Gabriel, Sylmar, Verdugo, and Eagle Rock. The Central and West Coast basins have clear legally adjudicated mechanisms in place that would allow for storage and recovery of additional stormwater in a manner beneficial to the City's local water supply goals.

An essential task of watershed management is to retain as much stormwater runoff as possible for groundwater recharge, which is the process of increasing an aquifer's water content through percolation of surface water. Groundwater recharge occurs in the SFB primarily through the infiltration of natural rainfall, captured local stormwater, and/or imported irrigation water. LADWP has not utilized imported water for spreading and recharge since 1998. Groundwater recharge supports the health of LADWP's SFB groundwater supplies by addressing the long-term reduction in stored groundwater within the SFB, protecting the safe yield of the groundwater basin, and ensuring the SFB's long-term water supply reliability.

During storm events, large volumes of stormwater are captured with existing centralized facilities for spreading purposes. Centralized stormwater capture facilities (i.e., spreading grounds, dams, reservoirs) are engineered features located in specific locations that capture large runoff flows when available, and subsequently deliver this runoff to spreading basins where it is infiltrated into underlying groundwater aquifers. These facilities on average have captured and infiltrated 27,000 AFY, with a historic high of 96,899 AFY. LADWP coordinates these activities with the LACFCD to effectively recharge the SFB through the spreading of native stormwater. Flood control facilities are the primary means to divert native runoff into the spreading ground facilities listed on Exhibit 7A and mapped on Exhibit 7B. LACFCD oversees operations at the Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The Tujunga Spreading Grounds are operated by LACFCD in partnership with LADWP.

Exhibit 7A
SFB Spreading Grounds Operations Data

		Annual Spreading (AF)	
Facility	**Location**	**Average[1]**	**Historic High[2]**
Branford	Mission Hills, CA	552	2,142
Hansen	Sun Valley, CA	13,647	35,192
Lopez	Lake View Terrace, CA	587	3,922
Pacoima	Pacoima, CA	6,851	24,164
Tujunga	Sun Valley, CA	5,034	31,479
	Total	26,671	96,899

1. Historic average through December 2015

2. Historic high at each facility was determined independently

Exhibit 7B
Spreading Ground Facility Locations

7.2 Additional Benefits of Watershed Management

Watershed management provides additional important benefits to the City, including increased water conservation, improved water quality, open space enhancements, wildlife habitat, flood control, and social/economic benefits.

7.2.1 Water Quality

Water quality in local streams, rivers and the Pacific Ocean is improved by reducing pollutants reaching downstream waterways. Stormwater runoff is a conveyance mechanism that transports pollutants from the watershed into various waterways, and ultimately the Pacific Ocean. Pollutants include, but are not limited to, bacteria, oils, grease, trash, and heavy metals. The City must comply with adopted Total Maximum Daily Loads (TMDLs) for pollutants. TMDLs set maximum limits for specific pollutants that can be discharged to a water body without causing the water body to become impaired or limiting certain uses, such as water body contact during recreation.

In 2009, the Los Angeles City Council adopted the Water Quality Compliance Master Plan for Urban Runoff. This 20-year plan provides a strategy for cleaning stormwater and runoff to protect the City's waterways and the Pacific Ocean. Capturing stormwater runoff for groundwater recharge removes a portion of the pollutant conveyance mechanism, which in turn reduces downstream pollution and thereby assists the City with water quality compliance and improving the overall health of its waterways.

The 1987 amendment to the Clean Water Act, required that the U.S. Environmental Protection Agency (USEPA) issue National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater permits for discharges from large Municipal Separate Storm Sewer Systems (or MS4s), which are systems serving a population of 250,000 or more. An NPDES Permit allows stormwater discharges into surface waters such as rivers, lakes, creeks, or the ocean. The Los Angeles Regional Water Quality Control Board (LARWQCB) issues NPDES Permits in the Los Angeles area, wherein the permit requires a decrease in pollutants to the maximum extent practicable in stormwater and urban runoff. NPDES MS4 Permit Order No. R4-2012-0175 was adopted on November 8, 2012 by the LARWQCB and became effective on December 28, 2012. The purpose of the Permit is to ensure the MS4s within Los Angeles County are not causing or contributing to exceedances of water quality objectives, which are set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWL) and water quality-based effluent limits (WQBELs). The EWMP compliance path is designed to enable permittees to collaborate within specific Watershed Management areas in order to implement multi-benefit regional projects that, where feasible, retain all non-stormwater runoff and all stormwater runoff from the 85th percentile, 24-hour storm event. EWMPs were prepared/approved for the City, by watershed, as part of LASAN's compliance with MS4 Permit in June 2015.

7.2.2 Water Conservation

Water conservation is achieved by enhancing the capture and management of localized runoff for uses that reduce potable demands. Distributed stormwater capture is the primary stormwater capture mechanism that provides water conservation. Distributed stormwater capture includes stormwater Best Management Practices (BMPs) that utilize vegetation, soils, and natural processes to manage stormwater runoff close to the source and capture localized dry and wet weather runoff. Distributed projects are smaller-scale projects that can provide water supply benefit at the neighborhood and even residential level, and can be placed throughout the City on any landscape, including parks, public and private development, public infrastructure and rights of way, and entire residential blocks. Distributed direct use projects aim to conserve water by capturing stormwater for uses that reduce potable water demand. Examples of distributed direct use projects that reduce potable demands include rain gardens, cisterns, and rain barrels.

7.2.3 Open Space Enhancement

Open space enhancement can be an added benefit of some stormwater capture/groundwater recharge projects, which at times provide additional open space areas that may include passive recreation, educational opportunities, and habitat restoration. Most projects involve increasing vegetation and recreational amenities to create opportunities for wildlife habitat and a recreational/educational resource for the local community. Additionally, open space enhancements assist the City in improving the overall quality of life for residents and provide substantial aesthetic improvements to the urban landscape.

7.2.4 Wildlife Habitat

Wildlife habitat can be improved or augmented through stormwater capture projects that include restoration of native vegetation. For example, projects that include open space enhancements may also provide habitat for aquatic life, birds and insects while helping to replenish groundwater supplies and improve water quality. Additionally, removal of invasive species increases native vegetation that provides food and habitat for wildlife.

7.2.5 Flood Control

Flood control benefits are achieved when demand on the conveyance capacity of the storm drain system is reduced. Groundwater recharge projects reduce potential flooding by diverting a portion of storm flows into recharge areas, thereby decreasing the demand on the overall capacity of the storm drain system.

7.2.6 Social/Economic

Social and economic benefits can be provided by stormwater capture projects. Specific benefits include: passive recreation, neighborhood revitalization, public health improvement, educational opportunities, and job creation.

7.3 Stormwater Capture Master Plan

The Stormwater Capture Master Plan, completed in 2015, investigated potential strategies for advancement of stormwater and watershed management throughout the City. Stormwater capture projections presented in this UWMP are based on the SCMP. The SCMP is a document that outlines LADWP's strategies over the next 20 years to: (1) implement stormwater policies, programs and projects in the City, and (2) contribute to the development of more reliable and sustainable local water supplies, which ultimately reduce the City's purchase of imported water.

7.3.1 Goals and Benefits

The SCMP includes an evaluation of existing stormwater capture facilities and projects, quantifies the maximum stormwater capture potential, develops feasible stormwater capture alternatives (i.e., projects, programs, policies etc.), and proposes potential strategies to increase stormwater capture. The SCMP also evaluates the multi-beneficial aspects of increasing stormwater capture, including potential open space alternatives, improved downstream water quality, and peak flow attenuation in downstream channels, creeks, and streams such as the Los Angeles River.

The goals of the SCMP include:

- Quantification of the stormwater capture potential, including both long-term (2099) as well as a 20-year implementation timeline;
- Identification of new projects, programs, and policies to increase stormwater capture for water supply;
- Prioritization of opportunities based on water supply criteria;
- Development of costs and benefits for proposed projects, programs, and policies;
- Definition of timing and key milestones at 5-year intervals/implementation rates (2020, 2025, 2030, and 2035); and
- Identification of potential funding strategies that could be used for program and project implementation.

7.3.2 Key Stakeholders

Project partners and supporters included:

- City of Los Angeles Department of Public Works
- City of Los Angeles Department of Water and Power
- Community-based organizations/ stakeholders (e.g. TreePeople, Inc., Council for Watershed Health, The River Project)
- County of Los Angeles Department of Public Works
- Los Angeles County Flood Control District
- Metropolitan Water District of Southern California
- U.S. Army Corps of Engineers

The SCMP's target audiences were grouped into four categories:

(1) The internal audience, which consisted of local and state elected officials, regulators, and entities involved in research or implementation programs related to stormwater capture. Groups included City, County, State, and Federal departments, such as the Mayor and City Councilmembers, USEPA Region 9 Administrators, LARWQCB members, and the SWRCB.

(2) The Technical Advisory Team, which consisted of internal LADWP and City staff, as well as representatives from other government agencies with planning-level interests and overlap with LADWP's master planning process.

(3) Key regional stakeholders, which included critical opinion leaders and leaders of environmental, neighborhood, civic, and community organizations.

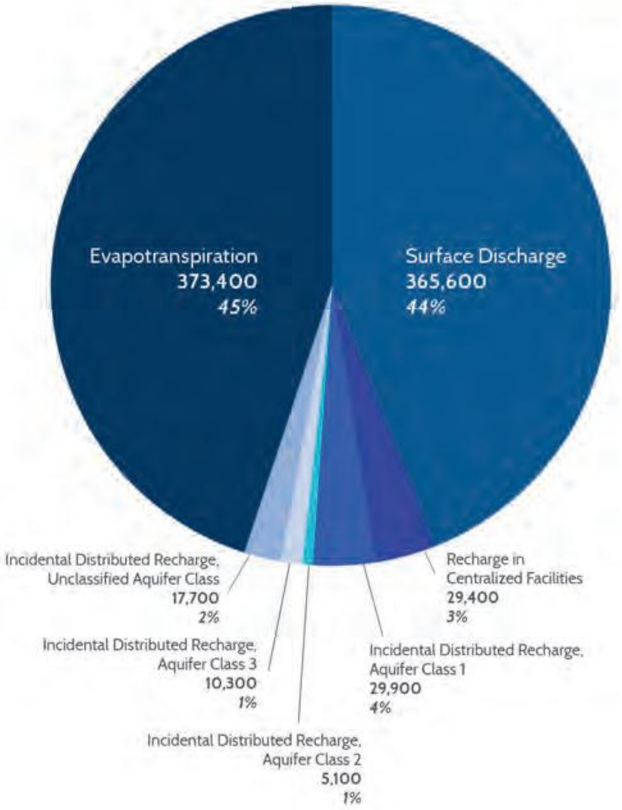
(4) The general public, which included the citywide audience, constituents of key stakeholders, and the media.

7.3.3 Existing Capture

The SCMP used two watershed models to estimate the existing stormwater capture occurring in the City, both in centralized facilities (e.g. spreading grounds) and as incidental distributed capture on pervious surfaces. The primary model was Los Angeles County's Load Simulation Program (LSPC) model because it is constructed with all of the major centralized facilities in place, calibrated to simulate runoff for the SCMP study area, and can simulate the routing, drainage networks, storage in dams, and infiltration in spreading grounds. The second model used to corroborate the LSPC results was the Ground Water Augmentation Model (GWAM) because it models evapotranspiration and recharge more robustly than LSPC, though it does not have the ability to simulate the flow routing.

As shown in Exhibit 7C, results indicate that an average annual volume of 831,400 AF of water enters the City (volumes are based on the average annual volume for the period of record from 1988 to 2011) as precipitation, irrigation, or runoff from upstream areas and leaves either as evapotranspiration, capture in centralized facilities, incidental capture on pervious surfaces, or as runoff downstream. Approximately 11% or 92,000 AF of the total incoming water currently goes to recharge aquifers, which is split between 29,000 AF of centralized stormwater capture and 63,000 AF of incidental distributed stormwater capture. However, only 35,000 AF of the incidental distributed stormwater capture is recharged into water supply aquifers. Combined, the total existing amount recharged into water supply aquifers is 64,000 AF. The San Fernando Valley is where most of the incidental distributed recharge is occurring and where all of the existing centralized facilities are located.

Exhibit 7C
Watershed Model Results



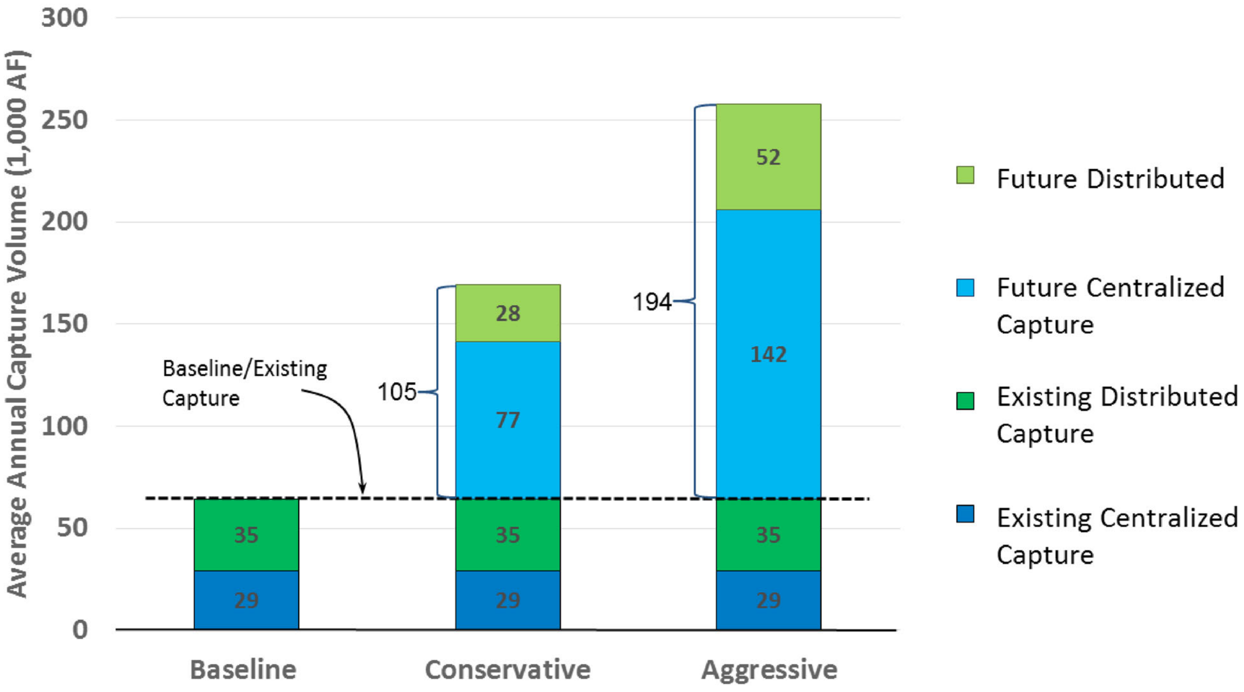
7.3.4 Potential Capture

The SCMP analyzed potential capture to determine how much of the inflow to the City could realistically be captured in centralized facilities (e.g. spreading grounds), distributed facilities/infiltration BMPs (e.g. rain gardens), incidental distributed capture/recharge on pervious land, and direct use storage facilities (e.g. cisterns). This analysis defined the Conservative and Aggressive implementation scenarios, and modeled those scenarios to determine how much capture is attainable. The two scenarios create an "envelope" of the range of potential future outcomes and reflect broader conditions outside the direct control of LADWP that could impede or accelerate stormwater capture.

Man-made obstacles that could potentially be addressed in the future were mapped for the entire City area, including contaminant plumes, superfund sites, dewatering permits, production wells influenced by untreated stormwater, and heavy industrial land uses. Under the Conservative Scenario these obstacles were assumed to remain, and those areas considered off-limits. Under the Aggressive Scenario, it was assumed that these obstacles were removed so that these constraints did not impact opportunity. For the purposes of the UWMP, the Conservative Scenario numbers are utilized.

The long-term (2099) stormwater capture potential is 179,000 AFY and 258,000 AFY under the Conservative and Aggressive scenarios, respectively. This capture potential is shown on Exhibit 7D and represents a long-term (2099) capture volume of approximately double and triple the existing volume.

Exhibit 7D
Existing and Long-Term (2099) Potential Stormwater Capture



The SCMP provides an implementation strategy for stormwater capture over the next 20 years, at 5-year increments, using centralized and distributed capture. Under the SCMP implementation strategy, LADWP could increase its stormwater capture by nearly 68,000 to 114,000 AF per year by 2035 for a total capture amount of 132,000 AF (Conservative) and 178,000 AF (Aggressive). Of the 68,000 AF increase in stormwater capture, under the Conservative Scenario:

- 35,000 AF will come from centralized stormwater capture for recharge.
- 31,000 AF will come from distributed stormwater capture for recharge.
- 2,000 AF will come from distributed stormwater capture for direct use.

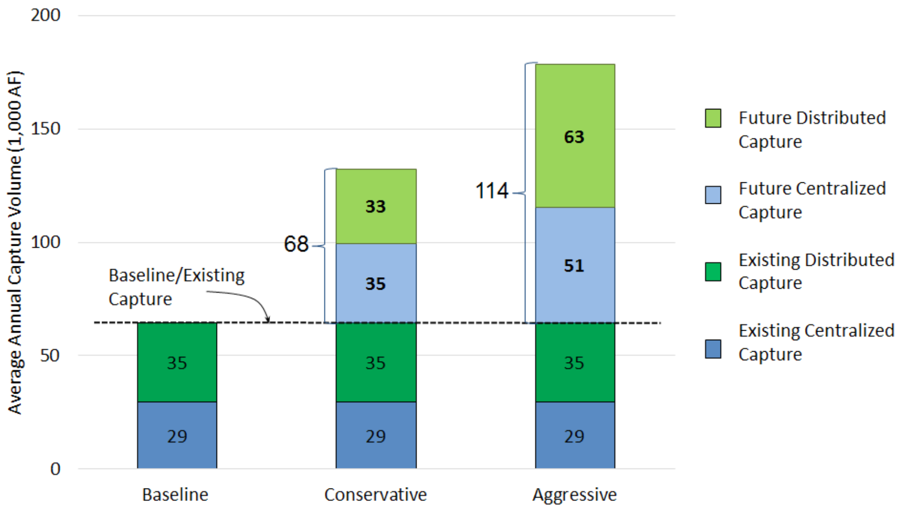
As in the existing condition, most of the increase in recharge will take place in the San Fernando Valley under both scenarios. Capture volumes are summarized in the Exhibits 7E and 7F for the 20-year implementation timeline ending in 2035.

Exhibit 7E
Potential Distributed and Centralized Stormwater Capture in 2035

Type of Stormwater Capture			Conservative Scenario (AF)	Aggressive Scenario (AF)
Existing/ Baseline Capture	Baseline Recharge	Centralized Capture	29,000	29,000
		Incidental Distributed Capture	35,000	35,000
		Subtotal Existing/Baseline Capture	64,000	64,000
Future Capture	Recharge Potential	Centralized Facilities	35,000	51,000
		Distributed Facilities	31,000	56,000
		Subtotal Recharge	66,000	107,000
	Direct Use Potential	Distributed Direct Use	2,000	7,000
	Total Future Capture		68,000	114,000
Total Existing/Baseline + Future Capture			132,000	178,000

Source: LADWP, Stormwater Capture Master Plan, 2015.

Exhibit 7F
Distributed and Centralized Capture - 2035



7.3.5 Implementation

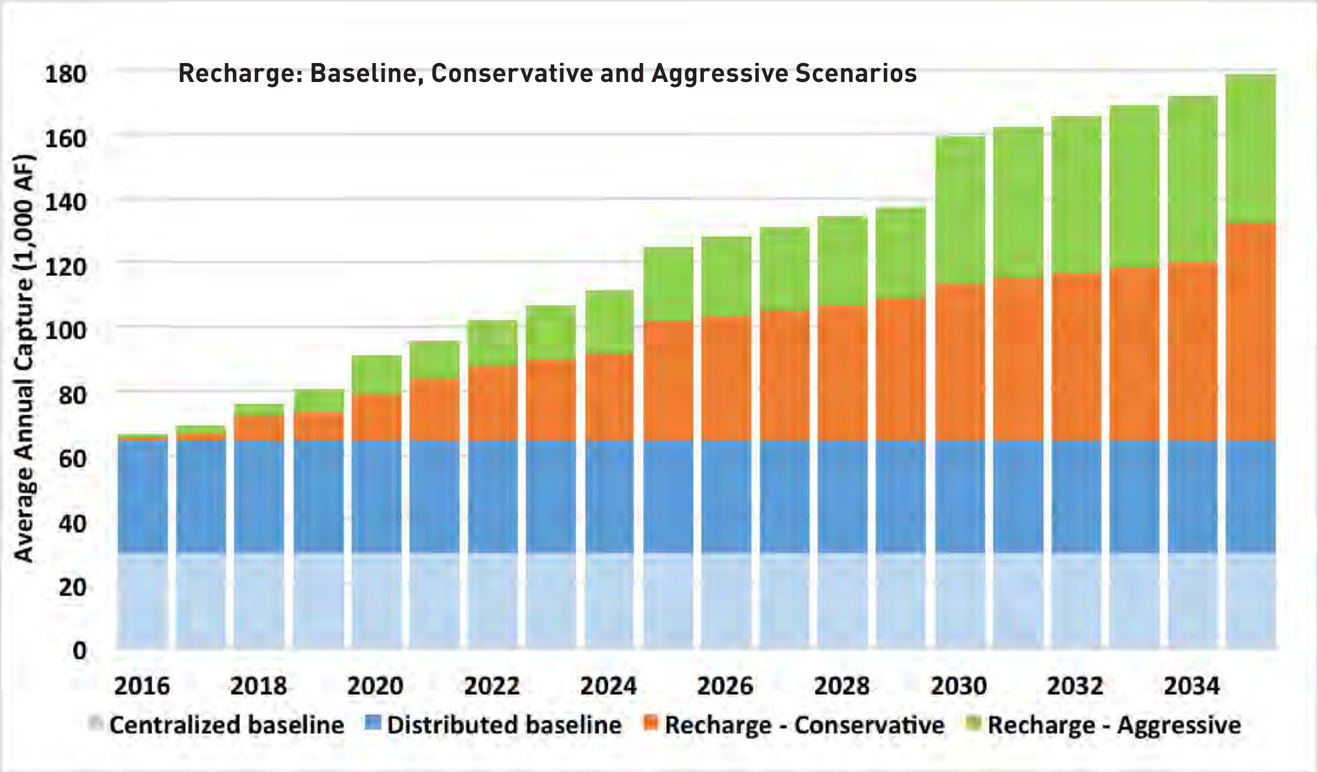
The SCMP defines five-year targets for stormwater capture over the next twenty years (2020, 2025, 2030, and 2035) and presents recommended avenues for implementation using a combination of centralized and distributed projects. The projected average annual capture through time is illustrated on Exhibit 7G.

For centralized projects, a comprehensive list of alternatives was compiled from review of previously-implemented stormwater capture studies, LADWP's current list of centralized projects, new project concepts, and stakeholder input. Implementation phasing was developed by analyzing the status of each project, understanding the technical complexity of each project, determining the level of permitting required, and assessing the individual project costs and partnership opportunities. These projects are described in Section 7.4.

For distributed capture, program type alternatives were developed by creating categories based on different combinations of project attributes, including tributary area (either projects capturing runoff from a single property or those that capture runoff from an entire neighborhood), land use type (private property land uses or streets in the public right of way), and ultimate use of captured water (aquifer recharge or direct use). This categorization includes (1) on-site infiltration, (2) on-site direct use, (3) green street programs, (4) subregional infiltration, and (5) subregional direct use. These programs are described in Section 7.5.

Using the SCMP centralized and distributed implementation rates for the Conservative Scenario, LADWP can more than double the existing capture over the next 20 years to approximately 132,000 AFY.

Exhibit 7G
Potential Average Annual Capture through Time



Tujunga Spreading Grounds

7.4 Centralized Stormwater Capture Projects

Existing centralized stormwater capture facilities will require infrastructure improvements to maximize their capture capacity during extreme wet years. Weather patterns vary dramatically in Los Angeles with extreme wet years and extreme dry years. Therefore, new projects are necessary to expand the capability to capture a larger portion of stormwater flows during wet years. Multiple opportunities exist to develop new recharge projects and improve existing recharge projects in the SFB as identified in the SCMP. LADWP is proactively working in close partnership with LACFCD on multiple stormwater projects. LADWP, in collaboration with LACFCD has supported and contributed resources toward the design, construction, and implementation of a variety of projects to increase groundwater recharge of the SFB. Additionally, multiple agreements between LADWP and LACFCD have been approved to facilitate the completion of recharge studies, design work, and construction projects in the SFB for groundwater recharge, flood protection, and other benefits.

The SCMP identifies a full suite of future centralized stormwater capture projects for implementation in the 20-year timeline for the Conservative Scenario, of which the most significant projects are summarized in Exhibit 7H. To guide LADWP in prioritizing projects, the SCMP developed evaluation criteria that were used to score each of the projects. The ranking criteria included items such as stormwater capture potential and cost, as well as ownership and partnership opportunities. Each of these criteria was weighted based on its relative importance to LADWP. Under the SCMP Conservative Scenario for 2035, centralized stormwater capture projects will increase stormwater capture by approximately 35,000 AFY for a total centralized capture of 64,000 AFY, raising groundwater levels and ensuring future water supply reliability.

Each future project listed in Exhibit 7H is described below.

Exhibit 7H
Potential Centralized Stormwater Capture Programs

Project	Historical Annual Recharge (AFY)	Increased Annual Recharge (AFY)	Expected Annual Recharge (AFY)	Estimated Project Completion	Total Project Cost (Millions $ 2015)
Big Tujunga Dam Sediment Removal	0	500	500	2021	$ 33.00
Boulevard Pit Multi-use Project	0	9,760	9,760	2034	$ 118.00
Branford Spreading Basin Upgrade	552	597	1,149	2019	$ 1.10
Bull Creek Stormwater Capture	0	3,000	3,000	2020	$ 8.80
Canterbury Power Line Easement	0	1,000	1,000	2034	$ 29.03
East Valley Baseball (Strathern) Park	0	750	750	2024	$ 16.15
Hansen Dam Water Conservation	0	3,400	3,400	2024	$ 6.00
Hansen Spreading Grounds	13,647	0	15,747[1]	0	$ -
Lakeside Debris Basin	0	238	238	2034	$ 0.12
Lopez Spreading Grounds Upgrade	587	480	1,067	2019	$ 8.00
Old Pacoima Wash	0	1,000	1,000	2024	$ 44.22
Pacoima Dam Sediment Removal	0	700	700	2024	$ 85.00
Pacoima Spreading Grounds Upgrade	6,851	2,000	8,851	2019	$ 30.00
Rory M. Shaw (Strathern) Wetlands Park	0	590	590	2019	$ 46.00
Sheldon Pit Multi-use Project	0	4,500	4,500	2034	$ 75.00
Tujunga Spreading Grounds Upgrade	5,034	4,200	9,234	2017	$ 27.25
Valley Generating Station Stormwater Capture	0	118	118	2020	$ 1.62
Van Norman Stormwater Capture	0	2,308	2,308	2021	$ 10.00
Whitnall Hwy Power Line Easement	0	110	110	2018	$ 11.00
Total Historical/Baseline + Future Capture	**26,671[2]**	**35,251**	**64,022[1]**		**$ 550.29**

Source: LADWP, Stormwater Capture Master Plan, 2015.

1. Hansen Spreading Grounds is a completed project that historically recharges 13,647 AFY. Recent upgrades in 2012 increased its capacity by 2,100 AFY to 15,747 AFY. This increased capacity did not contribute to historical baseline.
2. There is a known discrepancy between baseline actual capture (26,671 AFY) and existing SCMP modeled capture (29,000 AFY), but difference is assumed to be negligible.

Big Tujunga Dam Sediment Removal. The Big Tujunga Dam Sediment Removal Project will remove accumulated sediment from Big Tujunga Reservoir. It is estimated that the total amount of accumulated sediment in the Big Tujunga Reservoir is approximately 2 million cubic yards. Additional sediment is expected to flow into the reservoir over the next few years as the watershed recovers from recent forest fires. The sediment removal project will permanently remove up to 4.4 million cubic yards of sediment from the reservoir. The project will be completed over approximately five years starting in the summer of 2015 and will result in an increased annual capture/recharge of 500 AFY.

Boulevard Pit Multi-Use Project. The Boulevard Pit Multi-Use Project is an active aggregate mine operated by Vulcan Materials Company (Vulcan) which Vulcan estimates will be in service through 2020. The site is approximately 140 acres and has been mined to a depth of more than 250 feet below ground surface at its deepest point. If acquired and enhanced with stormwater capture facilities, then the available storage capacity for stormwater would be approximately 15,000 AF. According to the latest draft of the "Tujunga Wash Watershed Groundwater Recharge Master Plan", the average annual groundwater recharge benefit from converting the Boulevard Pit into a stormwater detention facility has been estimated at 9,760 AF.

Branford Spreading Basin Upgrade. The Branford Spreading Basin Upgrade will remove fine silts from the basin and install new pumps to drain the basin and transfer water to the Tujunga Spreading Grounds. The expected additional stormwater capture associated with this project is 597 AFY.

Bull Creek Stormwater Capture. The Van Norman Complex has a 13 square mile tributary area and has large potential for stormwater capture. These flows exit the Van Norman Complex through Bull Creek and are eventually lost to the ocean via the Los Angeles River. This project proposes conserving a portion of the lost water by diverting flows from Bull Creek, using a six-foot high rubber dam, and conveying flows through a 60-inch pipeline to Pacoima Spreading Grounds, where it would spread and recharge the SFB. The project will capture 3,000 AFY of stormwater.

Canterbury Power Line Easement. The Canterbury Power Line Easement project would modify the 18.8 available acres of the Canterbury Power Line Easement to construct 24 recharge basins. The recharge basins would receive and retain stormwater from the adjacent Pacoima Spreading Grounds and local flows from neighboring tributary area between the Pacoima Diversion Channel and the Canterbury Easement. Constructing the Canterbury Power Line Easement project is expected to capture 1,000 AFY of stormwater.

East Valley Baseball (Strathern) Park. The East Valley Baseball (Strathern) Park project will modify approximately 9 acres of land to construct three infiltration basins. The infiltration basins will receive and retain stormwater from the Tujunga Spreading Grounds and tributary flows from a local storm drain. The project is anticipated to capture 750 AFY of stormwater.

Hansen Dam Water Conservation. In 1999 the U.S. Army Corps of Engineers (USACE) completed a feasibility study to examine operational changes and facility improvements at the Hansen Dam as part of a cost-shared study with LACFCD. The only structural modification associated with the plan is the conversion of the two ungated outlets to slide gate outlets. Operational changes include allowing the water conservation pool to encroach into the flood control pool up to an elevation of 1,030 feet during the flood season (October 1 through February 28, as defined by USACE). This project will increase stormwater capture by 3,400 AFY.

Lakeside Debris Basin. The 70-acre Lakeside debris basin property, located just east and adjacent to the interchange of the 5 and 405 Freeways, is owned by the LADWP. The LADWP has developed a joint project with the Department of Recreation and Parks to plan, design, and construct sports fields within this property. This project will result in stormwater capture of 238 AFY.

Lopez Spreading Grounds Upgrade. The Lopez Spreading Grounds Upgrade involves deepening the existing Lopez Spreading Grounds and improving the intake and delivery system. LACFCD is the lead agency for the project. Additional stormwater capture in the amount of 480 AFY is expected from the project.

Old Pacoima Wash. The Old Pacoima Wash Stormwater Infiltration Project would involve construction of multiple infiltration basins in an approximately two-mile stretch of the Old Pacoima Wash. Each infiltration basin would receive and retain stormwater from the upstream Pacoima Spreading Grounds, and would act as an extension of the spreading grounds. Constructing the Old Pacoima Wash infiltration basins project is expected to capture 1,000 AFY in stormwater

Pacoima Dam Sediment Removal. The Pacoima Dam Sediment Removal project involves removing sediment from behind Pacoima Dam to increase storage volume. The sediment build-up behind the dam has decreased the capacity to about 3,300 AF. The project will involve excavating 5 million cubic yards of sediment and increasing the storage volume by 3,000 AF. Increased storage would decrease the number of reservoir spill events and increase the available recharge flow for the Pacoima and Lopez Spreading Grounds. The excavation will extend over 7,000 feet upstream of the existing dam. The project is projected to produce an additional annual water recharge benefit of 700 AFY.

Pacoima Spreading Grounds Upgrade. LADWP in conjunction with LACFCD is upgrading the Pacoima Spreading Grounds by improving the intake and stormwater storage capacity. Annual average stormwater capture is expected to increase by approximately 2,000 AFY with completion of the project. Other project benefits include flood protection, water quality improvements, and passive recreation.

Rory M. Shaw (Strathern) Wetlands Project. The Rory M. Shaw (Strathern) Wetlands Park Project consists of constructing stormwater capture and treatment facilities within the bounds of a 46-acre site formerly used as a gravel pit. This project will construct detention ponds and wetlands to store and treat stormwater runoff. The treated flows will then be pumped to the adjacent Sun Valley Park for infiltration in the underground basins. In addition to increased groundwater recharge, flood protection, and water quality improvements, the project will include habitat restoration and recreational opportunities. This project will increase stormwater capture by 590 AFY.

Sheldon Pit Multi-Use Project. The Sheldon Pit is located immediately adjacent to the LACFD's Tujunga Wash Channel on the south east bank. The pit was an active aggregate mine and is now operated by Vulcan for fine sediment placement and presently Vulcan has no plans to cease operations. The site is approximately 138 acres and has been mined to a depth of approximately 250 feet below ground surface at its deepest point. If acquired and enhanced with stormwater capture facilities along with multi-use attributes, then the available capacity of storage for stormwater would be approximately 6,000 AF. This project entails a massive water conservation effort by diverting water from Tujunga Wash into Sheldon Pit for groundwater recharge while open space attributes would provide benefits such as habitat enhancement and both active and passive recreational opportunities. The expected additional stormwater capture associated with this project is 4,500 AFY.

Tujunga Spreading Grounds Upgrade. LADWP and the LACFCD are cooperatively working to enhance the Tujunga Spreading Grounds. Enhancements include deepening and consolidating the existing basins into 9 large spreading basins, installing two high flow intakes with 60-foot inflatable rubber dams, and modifying the existing intake to improve water quality and remove sediments. Other equipment to be installed includes control houses, slide gates and spillways, and a remote control telemetry system. The project plan incorporates community access and open space for passive recreation, limited to operational constraints. The City will maintain the open space attributes of the project, and the LACFCD will continue to operate the recharge facilities. The project will increase stormwater capture by 4,200 AFY.

Valley Generating Station Stormwater Capture Project. LADWP is leading efforts to capture and infiltrate stormwater from the Valley Generating Station, from adjacent streets, and from the Tujunga Wash Channel. The project will capture and infiltrate all stormwater from the Valley Generating Station, increasing stormwater capture by 118 AFY.

Van Norman Stormwater Capture Project. This project will involve an outlet modification and cleanout of the Lower San Fernando Dam to allow for stormwater capture. Operational changes will be made to allow for controlled dam releases. This will allow for stormwater that is stored and captured at Van Norman Complex to run into the future Bull Creek Stormwater Capture Project pipeline and eventually infiltrate in Pacoima Spreading Grounds. This project will increase stormwater capture by 2,308 AFY.

Whitnall Hwy Power Line Easement. The Whitnall Highway Power Line Easement stormwater capture project is located in the Sun Valley Watershed in the northeast San Fernando Valley. Stormwater runoff will be captured at several locations along the easement and directed into a network of swales, culverts, and infiltration basins. Additional uses of the project site may include open space and recreational enhancements. The project will result in up to 110 AFY of stormwater capture.

7.5 Distributed Stormwater Capture

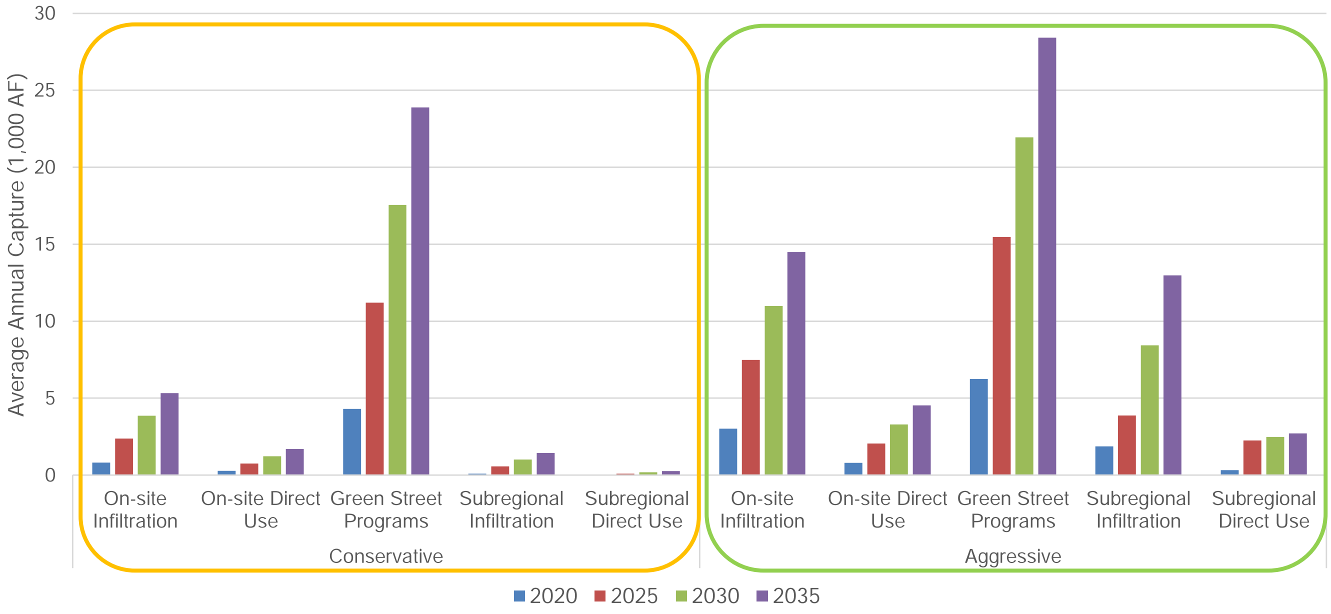
Distributed stormwater/runoff capture refers to capturing localized dry and wet weather runoff, and is further categorized as groundwater recharge capturing less than 100 AF or any direct stormwater capture system capturing less than 10 AF. Dry weather runoff is any runoff that occurs in the absence of rainfall from inefficient irrigation systems, overwatering, A/C condensate, or other wasteful outdoor water use practices, while wet weather runoff occurs as a direct result of rainfall. Wet weather runoff represents a significantly larger volume of water than dry weather runoff, but either weather runoff can be beneficially used.

Throughout the City there are opportunities to capture localized dry and wet weather runoff for local reuse. However, Los Angeles' storm drain systems have historically been designed to protect life and property from flood impacts by quickly redirecting rainfall and runoff from impervious surfaces into the City's storm drain system and ultimately the Pacific Ocean without regard to water supply or water quality impacts.

While centralized stormwater capture plays a key role in groundwater recharge in the City of Los Angeles, space constraints limit opportunities for new large centralized facilities and have changed the focus towards distributed stormwater capture. Distributed stormwater capture includes stormwater management BMPs that utilize vegetation, soils, and natural processes to manage stormwater runoff close to the source. Distributed facilities can be placed throughout the City on any landscape, including parks, public and private development, public infrastructure and rights of way, and entire residential blocks they can therefore be installed at numerous locations within the highly developed landscape of Los Angeles.

Under the SCMP Conservative Scenario for 2035, distributed stormwater capture will increase by 33,000 AFY (31,000 AFY for infiltration and 2,000 AFY for direct use).

Exhibit 7I
Distributed Capture by Program (excludes baseline/existing capture)



7.5.1 Program Alternatives

For distributed capture, the SCMP program type alternatives that will provide the projected stormwater capture increase of 33,000 AFY include:

- On-site infiltration;
- On-site direct use;
- Green streets;
- Sub-regional infiltration; and
- Sub-regional direct use.

Each of these is described below and Exhibit 7I illustrates the amount of additional distributed stormwater capture by program type through the 20-year SCMP implementation timeline. Implementation of green street programs constitutes the largest component of future distributed capture.

7.5.1.1 On-site Infiltration

On-site infiltration is the practice of collecting stormwater runoff from impervious or compacted areas on a property for infiltration within the same parcel. BMPs that can be implemented as part of on-site infiltration include permeable pavement, bio-infiltration, and subsurface infiltration. Bio-infiltration BMPs can take a variety of forms, but they all have the common elements of storage, bio-filter media, and plants adapted to tolerate periods of inundation and dryness. Specific bio-infiltration types are described below.

Rain Garden/Bio-Infiltration Basin. A rain garden is a depressed vegetated area underlain by porous soil media and sometimes open-graded gravel. The wide, shallow excavation allows runoff to collect and be used by the vegetation. Water in excess of what the plants need to survive can slowly seep into the surrounding soils. Large-scale rain gardens are often referred to as bio-retention or bio-infiltration basins. Not only do they provide for an attractive landscape, but they are also effective in treating and infiltrating stormwater for local groundwater recharge. Bio-infiltration basins typically have a deeper gravel layer to accommodate larger runoff volumes and some form of pre-treatment is provided due to the higher amount of debris, trash, and sediment in the inflow due to the larger tributary area.

Tree Wells/Planters. Tree wells and planters are a type of bio-infiltration BMP that is most typically used in parking lots, highly-trafficked pedestrian corridors, and commercial or residential parkways and streetscapes. Storage is provided in the void space of the soil, and a gravel base is used to maximize infiltration. These BMPs have a small footprint, providing wide application to locations where space constraints exist. Planters are designed to treat roof runoff and runoff from small tributary areas, accepting runoff from roofs, walkways, sidewalks, or parking areas and holding the runoff so that it can slowly be infiltrated into the ground.

Vegetated (Parkway) Swales. A vegetated swale is a shallow, vegetated hydraulic conveyance that collects runoff while slowing it down and allowing it to infiltrate. Infiltration capacity can be maximized through the use of check dams running perpendicular to flow. Vegetated swales are most commonly found along roadways.

Bump-Outs. A curb bump-out is traditionally a traffic calming measure in which the curb is extended into a crosswalk or roadway to reduce crossing distance for pedestrians, increase pedestrian safety, and create the visual effect of the roadway narrowing for drivers. Curb bump outs can act as bio-infiltration BMPs when runoff from the roadway, sidewalks, or the roofs of adjacent buildings is allowed to enter the bump out via a curb cut.

7.5.1.2 On-site Direct Use

On-site direct use is the practice of collecting stormwater generated on-site for non-potable on-site uses (e.g. irrigation or toilet flushing). On-site direct use reduces potable demand (water conservation), therefore taking pressure off the municipal supply. Rain barrels and cisterns are the primary BMPs for on-site direct use.

Rain Barrels. Rain barrels are distributed stormwater capture devices used to store rainwater collected from roofs via roof rain gutter systems. Harvested water can be used for outdoor irrigation at a later time. If overflow infiltration is provided, and/or greater roof area is utilized, annual rainfall volume captured can be significantly greater. Through participation in the SoCal Water$mart Program, LADWP customers are currently eligible to receive a rebate for a maximum of four rain barrels of up to $100 per rain barrel with a minimum size of 50 gallons. More information on this program is available in Chapter 3, Conservation.

Cisterns. Cisterns are larger than rain barrels and can range from 100 to 10,000 or more gallons. They store diverted runoff from roof areas and other impervious surfaces. Cisterns have applicability for nearly all land uses as they can be easily scaled up or down to fit size and water use demands of a site. Residential, commercial, institutional, industrial, and educational land uses can implement cisterns to capture stormwater and use it for irrigation, toilet flushing, or other non-potable uses (i.e., cooling towers, cleaning tools or equipment, concrete mixing, dust control, etc.). Because residential irrigation can account for up to 40 percent of domestic water consumption, water conservation measures such as cisterns can be utilized to reduce demands, especially during hot summer months. Through participation in the SoCal Water$mart Program, LADWP customers are currently eligible to receive a rebate for a maximum of one cistern of up to $400 per cistern with a minimum size of 200 gallons. More information on this program is available in Chapter 3, Conservation.

The Great Los Angeles Water Collaborative, formerly known as the Multi-Agency Collaborative Phase II, is a pilot project demonstrating the use of cisterns to further stormwater capture initiatives to increase water supply, improve water quality, and flood attenuation. In partnership with TreePeople, the project is equally funded by LADWP, LASAN, and LACFCD, to collaboratively plan, fund, implement, and monitor landscape transformation at six properties in the City of Los Angeles, including electronically monitored and remote controlled cisterns. The project will seek to demonstrate the viability of increasing stormwater capture for groundwater recharge and on-site reuse in lieu of potable water. Cisterns being installed range in size from 420 gallons to 1,981 gallons. Multiple tanks are installed per site and result in systems that range from 840 to 3,962 gallons. The project also includes an analysis of the pilot-to-scale potential for this project-type. Installation of cisterns will be complete by March 2016.

Exhibit 7J is an underground rain-harvesting cistern. This 216,000 gallon cistern is located at Coldwater Canyon Park, harvesting local rainwater. Stormwater is collected from structure rooftops, fire lane, parking lot, and the surrounding landscape. The water is filtered and then used throughout the year to irrigate landscape on the top level of the park. The underground tank is 70 feet in diameter and 8 feet deep.

Exhibit 7J
Construction of Underground Cistern for Stormwater Capture

(Photo courtesy of TreePeople)

7.5.1.3 Green Street Programs

A green street is a right-of-way that maximizes stormwater capture through a combination of stormwater BMPs and design considerations. Practices could be placed in the street and sidewalk (permeable pavement, dry wells) or in the parkways (vegetated swales, bio-retention curb bump-outs, tree wells, and planters, and bio-retention basins). Green streets provide an alternative to traditional impervious roadways and streetscapes by incorporating one or more BMPs to manage stormwater runoff while still maintaining the roadway's primary function of accommodating vehicular traffic and safe pedestrian access. Stormwater BMPs capture and infiltrate runoff from both the street itself, as well as some percentage of adjacent properties. Green streets may be implemented in residential and commercial streets, at street-ends that dead end at major rivers (i.e. "Rio Vistas"), and in specially-zoned areas such as Pedestrian Oriented Districts and Business Improvement Districts.

7.5.1.4 Subregional Infiltration

In sub-regional infiltration, stormwater runoff is collected from multiple parcels, city blocks, or entire neighborhoods into a single infiltration BMP within the public right-of-way or adjacent public/private lands. Sub-regional infiltration programs often divert water from a storm drain line; however, in some instances, they may be fed via surface flow. BMPs that could be used for a sub-regional infiltration program include underground infiltration galleries and bioretention.

7.5.1.5 Sub-regional Direct Use

In sub-regional direct use, stormwater runoff is collected from multiple parcels, blocks, or an entire neighborhood for use in indoor or outdoor non-potable uses. Flows are routed into storage facilities, such as a cistern or pond, by diverting storm drain infrastructure from the public right-of-way onto a private or publicly-owned parcel with available space and adequate reuse purpose. Stored water is most often treated and pumped to its end purpose, which may include irrigation, toilet flushing, or cleaning vehicles and equipment.

7.5.2 Distributed Stormwater Capture Projects

As an outgrowth of the 2006 City of Los Angeles Water Integrated Resources Plan (IRP), came the development of the SCMP with its increased emphasis on stormwater capture. Within the SCMP neighborhood recharge concept efforts have evolved from the conceptual stage visualized in the IRP to actual identified projects in the City that infiltrate wet weather runoff as close as possible to the point of origin. A few of the identified projects are highlighted below:

Laurel Canyon Boulevard Green Streets Project. The Laurel Canyon Boulevard Green Street Project will construct a series of vegetated infiltration swales and dry wells along the northeast side of Laurel Canyon Boulevard, between Terra Bella and Kagel Canyon Streets. During storm events, stormwater runoff will be captured, treated, and infiltrated to replenish the San Fernando Groundwater Basin. The project will also offer learning opportunities to help educate the community on watershed related issues, improve curbs, gutters, sidewalks, and decrease local flooding during storm events. The project will collect stormwater runoff from approximately 123 acres of residential area and infiltrate nearly 40 acre-feet of water per year.

Burbank Boulevard Widening Project. The Burbank Boulevard Widening Project is a street and sidewalk improvement project combined with stormwater capture elements. The project is located on Burbank Blvd between Lankershim Boulevard and Cleon Avenue in North Hollywood and will capture surface runoff from the surrounding 57 acre tributary area. The project will benefit the environment, enhance public access, reduce local flooding, and augment the City's groundwater supply. Construction is anticipated to begin mid-2016. LADWP plans to contribute to the project for the installation of 16 dry wells.

Branford Street: Laurel Canyon to Pacoima Wash Stormwater Capture Project. The Branford Street Stormwater Capture Project will capture runoff from a 173 acre tributary area that has no storm drains. The project is in Council District 6 and 7, located near the intersection of CA-170 and I-5. Project could capture and recharge up to 148 acre-feet per year on average into the San Fernando Groundwater Basin through various stormwater BMPs.

Great Street: Lankershim Boulevard (Chandler to Victory). The Lankershim Boulevard Stormwater Capture Project will capture runoff from a 83 acre tributary area that currently has no storm drains. The project is in Council District 2 and could capture and recharge up to 105 acre-feet per average rainfall year into the San Fernando Groundwater Basin. Potential BMPs that could be implemented in this project include parking lot pavers, infiltration swales and chambers, parkway swales, and dry wells along curb and gutter.

Great Street: Van Nuys Boulevard (Laurel Canyon to San Fernando). The Van Nuys Boulevard Stormwater Capture Project is located in Council District 7 and will capture runoff from a 99 acre tributary area that currently has no storm drains. The intersection between Van Nuys Boulevard and Laurel Canyon Boulevard is currently the confluence point for the 99-acre watershed. The project has the potential to capture and recharge up to 95 acre-feet per year on average into the San Fernando Groundwater Basin through various stormwater BMPs.

Glenoaks & Filmore Stormwater Capture Project. The Glenoaks-Filmore Stormwater Capture Project is located in a sub-watershed that would benefit from the installation of stormwater capture BMPs. The project is located in Council District 7, near the intersection of CA-118 and I-210. The project will capture and recharge an average of 86 acre-feet per average rainfall year into the San Fernando Groundwater Basin through various stormwater BMPs

Agnes Avenue: Vanowen to Kittridge Stormwater Capture Project. The Agnes Avenue Stormwater Capture Project is located in a sub-watershed that would benefit from the installation of stormwater capture BMPs. The project is located in Council District 2, near the intersection of CA-170 and Vanowen Street. The project will capture runoff from a 56 acre tributary area that currently has no storm drains. The project could capture and recharge up to 60 acre-feet per year on average in the San Fernando Groundwater Basin through various stormwater BMPs.

Case Study:
Woodman Avenue Green Infrastructure Project

The Background

The Woodman Avenue Green Infrastructure Project (Project) was initially proposed by the local Panorama City Neighborhood Council during the development of the Tujunga-Pacoima Watershed Plan process, which The River Project authored. The Project helps recharge the San Fernando Groundwater Basin, improves water quality, and alleviates local flooding.

The Project

The Woodman Avenue Green Infrastructure Project was completed in February 2014.The total Project cost was $3.4 million. Proposition grant funding contributed $1.65 million towards the Project cost. LADWP contributed $1.5 million, and LASAN provided the remaining $250,000.

The Project replaced an existing 16-foot wide, 3,500-foot long concrete median. The Project captures surface runoff, from approximately 111 acres, that previously ran along street gutters and into storm drains, through the Tujunga Wash and Los Angeles River, and into the ocean. This runoff is now directed into a vegetated swale, where flows percolate into an underground retention system for infiltration.

Public Right-of-Way Improvements

Bioswale

The newly installed median includes bio-swales to capture and treat stormwater runoff from the local sub-watershed mostly from residential land use. The bioswales are open shallow channels with gently sloped sides and bottoms filled with vegetation and river rock where stormwater runoff is collected. Bioswales help reduce the flow velocity and treat stormwater runoff by filtering it through the vegetation in the channel, through the subsoil matrix, and/or into the underlying soils. In addition, bioswales trap particulate pollutants (suspended solids and trace metals), promote infiltration and serve as part of the whole stormwater drainage system installed for this project.

Infiltration Gallery

A large infiltration gallery was installed underneath the street right-of-way. The gallery is a sub-surface stormwater collection system, constructed with perforated pipes into which runoff water flows and is then allowed to infiltrate into the ground to recharge the local groundwater basin.

Decomposed Granite Walkway

A walkway was installed to maintain pedestrian access in the median. A permeable decomposed granite walkway will help reduce runoff and promote infiltration.

The Benefits

The finished project incorporates a mixture of strategies to produce multiple levels of benefits not only to the neighborhood, but also to the local and regional community that can take this work as encouragement:

- Capture stormwater and dry-weather runoff to prevent flooding and decrease pollution of local rivers and oceans
- Reduce impermeable surfaces and increase groundwater recharge
- Improve neighborhood aesthetics through increased green space and public right-of-way improvements
- Increase groundwater recharge by 55 acre-feet per year
- Encourage community awareness of water and associated environmental issues.

Bioswale along Woodman Avenue Median

Case Study:
Garvanza Park

The Background

Garvanza Park (Project) was proposed as part of the Arroyo Seco Watershed Management and Restoration Plan (WMRP), completed in 2006 by North East Trees. The Project is located at Garvanza Park in Highland Park. The Project will capture rainwater and urban runoff from a more than 85-acre tributary area in and around Garvanza and Highland Park.

The Project

The Project began in late 2010 and was completed by May 2012. The total Project cost was $3.884 million. LADWP contributed $244,000. The remaining Project costs were funded by Proposition 40, Proposition 13, Los Angeles Supplemental Environmental Project funds, and LASAN. The Project captures and treats stormwater and urban runoff diverted from the Avenue 63 storm drain into an underground BMP treatment system consisting of a hydrodynamic separator, settling basin, retention chamber and infiltration chamber.

Public Right-of-Way Improvements

Underground tanks

Two large underground tanks capture up to 3 acre-feet per rain event. The stormwater is harvested and cleaned through a pre-treatment system. Some of the rainwater enters into a cistern and allowed to infiltrate to replenish groundwater. The rest of the rainwater enters another cistern where water is stored and used for subsurface park irrigation for more than 20% of Garvanza Park, conserving potable water supplies.

Storage tanks at Garvanza Park

The Benefits

The finished project incorporates a mixture of strategies to produce multiple levels of benefits:

- Provide storage volume and treatment for a ¾” storm event
- Meet all standards for dry- and wet-weather runoff, as published in the Metals TMDL for the Los Angeles River
- Bacteria reduction to meet or reduce exceedance days on TMDL limits for the Los Angeles River
- Achieve 100% capture of trash from the upstream watershed in compliance with the Los Angeles River Trash TMDL.

Underground infiltration gallery in Garvanza Park

Case Study:
Sun Valley EDA Public Improvements Project

The Background

Originally intended to be a street improvement project, the Sun Valley Economic Development Administration (EDA) Public Improvements Project (Project) is a superb example of the power of multi-agency collaboration. The Project is a combined effort between the Los Angeles Bureau of Engineering, the Los Angeles Bureau of Sanitation, and the Los Angeles Department of Water and Power combining street & sidewalk improvements with stormwater capture. The Project benefits the environment, enhances public access, reduces local flooding, and augments the City's groundwater supply.

The Project

The Project captures surface runoff from approximately 146 acres that currently flows along street gutters to storm drains, through the Pacoima Diversion Channel, and ultimately down the Los Angeles River and into the Pacific Ocean. The Project is located on Branford Street between San Fernando Road and Arleta Avenue in Arleta. Construction has been completed as of early 2016. Total Project cost was $6.66 million. LADWP contributed $2.44 million for stormwater capture elements, a grant funded $3.165 million, and LASAN matched the remaining $1.055 million Project cost.

Intersection Prior to Construction

Public Right-of-Way Improvements

Dry-Wells

Street gutter flows are diverted into over 31 dry wells for groundwater basin infiltration. Each dry well system consists of three components: a catch basin to capture street flow, a settling chamber which captures sediment & contaminants, and an infiltration chamber which helps stormwater to percolate into the ground.

Infiltration Chamber during Rain Event

The Benefits

The finished project incorporates a mixture of strategies to produce multiple levels of benefits:

- Capture stormwater and dry-weather runoff to alleviate flooding and decrease pollution of local rivers and oceans
- Increase groundwater recharge by 93 acre-feet per year
- Protect pumping rights for the City, guaranteeing a more reliable water supply

Intersection After Construction

Infiltration Chamber during Rain Event

7.5.3 Best Management Practices

This section provides a short review of the regulatory environment that promotes distributed stormwater capture and implementation of BMPs.

7.5.3.1 MS4 Permit

On November 8, 2012, the LARWQCB adopted NPDES MS4 Permit Order No. R4-2012-0175, which requires that large new development/redevelopment projects provide onsite or offsite best management practice (BMP) such as infiltration.

The MS4 Permit could impact BMP projects in two ways: (1) BMP projects with significant areas of disturbance could trigger the permit requirements and therefore have minimum sizing requirements for the BMPs set by the permit terms; or (2) development/redevelopment projects that would have otherwise not included BMPs, will now have to include stormwater BMPs capable of meeting permit requirements for onsite or offsite retention of stormwater. More information on the Los Angeles County MS4 Permit is available on the LARWQCB website at: http://www.waterboards.ca.gov/losangeles/.

7.5.3.2 Low Impact Development

LADWP, in conjunction with other City departments, is developing programs to highlight water conservation through Low Impact Development (LID) and installation of BMPs. LID is a stormwater management approach that is designed to reduce runoff of water and pollutants from the site(s) at which they are generated. BMPs consist of practices designed to infiltrate runoff for groundwater recharge, reduce runoff volume, and capture rainwater for reuse.

The City has taken significant strides towards promoting distributed capture and infiltration of runoff through development of a suite of distributed projects. A Low Impact Development (LID) Ordinance was adopted in May 2012, which is a set of site design approaches and BMPs that are designed to address runoff and pollution at the source. The City's LID ordinance has significant benefits to stormwater capture because it requires that all development and redevelopment projects that create, add, or replace 500 square feet or more of impervious area to capture the three-quarter inch rain event for infiltration or reuse on-site. Single-family residences can comply in a more simple way by installing rain barrels, permeable pavement, rainwater storage tanks, or infiltration swales.

In general, implementing integrated LID practices into new development and retrofit of existing facilities can result in enhanced environmental performance while at the same time reducing development costs when compared to traditional stormwater management approaches. According to the USEPA, infrastructure costs associated with LID practices as compared to traditional stormwater treatment practices result in significant cost savings ranging between 15 percent and 80 percent less than traditional practices.

Retrofit of LADWP Facilities to Meet LID Standards. LADWP is assessing its existing facilities for potential retrofits using LID BMPs. LID BMPs under consideration include pervious pavement, stormwater capture, curb cuts, bioretention cells, and amended soils. Expected benefits include: increased groundwater recharge; decreased outdoor water use; increased compliance with stormwater regulations and Model Water Efficient Landscape Ordinance; improved environmental conditions for employees and the public; increased awareness of LID and examples for residents.

New LADWP Facility Development Using LID Standards. LADWP's Watershed Management Group developed a framework for implementation of LIDs and BMPs. Within the framework, LID and BMPs are taken into consideration during the planning, design, implementation, and maintenance processes associated with new LADWP facilities. Benefits include: reduced maintenance costs for stormwater infrastructure and landscape; reduced costs for grading by using natural drainage; reduced sidewalk cost by using narrower sidewalks; increased groundwater recharge; and reduced runoff volume and pollutant loading.

7.5.3.3 Incentive Programs that Promote Stormwater Capture

In addition to investing in centralized stormwater projects to recharge groundwater, LADWP has encouraged customers to participate in parcel-based stormwater capture incentive programs to promote stormwater infiltration. LADWP provides incentives for customers to install rain barrels and cisterns placed on their property. Through its partnership with MWD's SoCalWaterSmart website, LADWP's Water Conservation Program offers rebates to offset the cost of rain barrels (minimum capacity of 50 gallons) and cisterns (minimum capacity of 200 gallons). Customers can request rebates for up to four rain barrels or one cistern through the SoCalWaterSmart.com website.

Originally launched in October 2013, the program offered a $75 rebate for rain barrels. In response to Mayor Eric Garcetti's Executive Directive No. 5, the rebate amount was increased to $100 in November 2014. In November 2015, LADWP further expanded its Water Conservation Program to include a cistern rebate of $400. Additional incentive programs to advance conservation and stormwater capture initiatives are continually being studied by LADWP.

7.5.3.4 Legislation/Ordinances that Promote Stormwater Capture

Recently, several pieces of legislation that could promote stormwater capture and storage have been passed on a regional and state-wide level:

- As part of LASAN's compliance with the new LA County MS4 Permit It has developed EWMP plans.

- County of Los Angeles LID ordinance, which became effective in October of 2008 and amended in November of 2013, requires the use of LID principles in all development projects except road and flood infrastructure projects.

- The State Recycled Water Policy mandates specific goals for stormwater use by 2020 and 2030.

- Assembly Bill No. 1881 and Senate Bill SBX7-7 specify water conservation measures that promote stormwater capture and storage as a means of compliance.

- City of Los Angeles Council Motion 14-0748, Development of draft ordinance that requires all public street construction and reconstruction projects to incorporate Stormwater Management Guidelines for Public Street Construction and Reconstruction (Sustainable Streets Ordinance).

- Executive Directive No. 5 signed by Mayor Garcetti on October 14, 2014, provided strategies to comply with state-wide conservation orders and address the ongoing challenges to water supply reliability.

- Adoption of Los Angeles Sustainable City pLAn on April 8, 2015, based on ED5, that calls for increasing the sustainability of the City, including reducing LADWP's purchase of imported potable water by 50% by 2025, and sourcing 50% of water locally by 2035 as outlined in Chapter 1, Introduction.

In addition, guidance documents such as Water LA's Homeowner's "How-To" Guides are becoming available to help individuals set up small-scale stormwater capture and use systems. And the U.S. Bureau of Reclamation/ LACFCD Basin Study provides specific recommendations for basin management that can ultimately be applied to large-scale centralized stormwater storage programs. Furthermore, changes in basin management, such as the Central Basin Judgment Amendment Process, may help facilitate the use of groundwater basins for storage of stormwater and other "new" water supplies, and can serve as an example for regulators to develop stormwater storage policies in basins across LA County.

7.6 One Water LA

The City's IRP is a unique approach of technical integration and community involvement to guide policy decisions and water resources facilities planning. The IRP recognizes the inter-relationship of water, wastewater, and runoff management. Initiation of the IRP began in 1999 and culminated in its adoption in 2006. Through the stakeholder driven IRP process detailed facilities plans were developed for the City's wastewater and stormwater systems through the planning horizon of 2020.

One Water LA 2040 (One Water) plan is an initiative building upon the success of the IRP. One Water extends the planning period of the IRP out to 2040 and takes into consideration an additional emphasis on environmental, social, and sustainability factors. The overarching goal of One Water is to maximize resources through the integration of multi-beneficial programs and projects to make the City greener and more sustainable. A more in-depth discussion of One Water LA is provided in Chapter 10, Integrated Resources Planning.

7.7 Integrated Regional Water Management Plan (IRWMP) Program

LADWP is a participating agency in the Greater Los Angeles County (GLAC) IRWMP which encompasses portions of 4 counties, 84 cities, and many local agencies and districts. The IRWMP aims to address water resources needs of the region in an integrated and collaborative manner to improve water supplies, enhance water supply reliability, improve surface water quality, preserve flood protection, conserve habitat, and expand recreational access in the region. An initial plan was adopted on December 16, 2006 and has been subsequently updated. An updated plan was completed in 2013 and adopted in February 2014 to comply with new requirements, improve content, and maintain eligibility for funding opportunities.

Objectives identified in the initial IRWMP were refined and updated resulting in six objectives for the IRWMP Update: improve water supply; improve surface water quality; enhance habitat; enhance open space and recreation; reduce flood risk; and adapt to and mitigate against climate change vulnerabilities. For more detailed information on the IRWMP, please refer to Chapter 10, Integrated Resources Planning.

7.8 Stormwater Capture Master Plan Costs

Detailed costs for implementation of every aspect of the SCMP were not developed, except for centralized projects where project specifics are well defined. The SCMP is a planning level document, not a programmatic document. The SCMP provides guidance for implementing cost effective distributed and centralized projects and determining whether outside funding and partnerships are necessary for implementing certain projects.

Exhibit 7K, below, compares the range of costs of the various watershed management opportunities LADWP is pursuing and/or investigating.

The replenishment cost of recharge water is estimated at approximately $60 to $4,400 per AF, inclusive of the avoided cost of Tier 1 untreated imported water and the value assigned by MWD for participation in MWD's Local Resource Program. Direct use of stormwater without recharge has a cost of approximately $1,200 to $13,800, inclusive of the avoided cost of Tier 1 treated imported want and the value assigned by MWD for participation in MWD's Local Resource Program. The difference between the two values is related to the cost of untreated imported water for groundwater recharge versus treated imported water for direct use. The estimated values of recharge water and direct use are utilized to determine if a project is cost-effective.

Within the SCMP a criteria was developed for evaluating projects based on cost. For infiltration projects with a cost range of less than $1,100 per AF and direct use projects with a cost range of less than $1,550 LADWP may implement and/or fully fund the projects. For projects with a cost range greater than these amounts, LADWP may still pursue the projects by taking the following steps to bring LADWP's share of the cost into its target range:

- LADWP may seek outside funding and partnerships to implement the project itself, or
- LADWP may provide partial funding to partners that will implement the project, or
- LADWP may consider implementing projects it determines to be beneficial without additional funding or partners on a case by case basis, or

Within the SCMP, potential financing and funding sources are described. Financing includes local bonds and State Revolving Funds. Funding opportunities include grants and project partnerships. For private property owners potential financing mechanisms include on bill financing, credits, rebates, and implementation of a program similar to the Los Angeles County Property Assessed Clean Energy Program.

Exhibit 7K
Cost Analysis

Water Source	Average Unit Cost ($/AF)
Centralized Stormwater Capture	$60 – $4,400
Distributed Stormwater Capture	
Subregional Infiltration	$600 – $1,300
Subregional Direct Use	$1,200 – $6,800
On-site Infiltration	$900 – $3,100
On-site Direct Use	$3,200 – $13,800
Green Streets	$600 – $2,400
Self-Mitigating BMPs	$4,000 – $19,100

7.9 Summary

Watershed management involves retaining as much stormwater runoff as possible for groundwater recharge. During storm events, large portions of stormwater are captured with existing centralized facilities for spreading purposes. However, increased urbanization has decreased natural infiltration, thereby contributing to declines in local groundwater levels. There is significant potential for increased stormwater capture in the City.

Groundwater recharge using captured stormwater is essential to maintaining groundwater supplies, addressing the overall long-term decrease in stored groundwater, protecting the safe yield of the groundwater basin, and ensuring the long-term water supply reliability of the SFB. Proposed centralized projects will enable the City to utilize its stored water credits in a sustainable manner and prevent conditions of overdraft in the basin. The UWMP projects that by 2040 there will be a minimum of 15,000 AFY of increased groundwater pumping in the SFB due to water supply augmentation through centralized stormwater infiltration. Anticipating that stored groundwater will rebound in response to enhanced groundwater replenishment, LADWP will work with the ULARA Watermaster to continue observing actual water levels and re-evaluate basin safe yield to allow additional increases in groundwater production over time as SFB elevations rebound.

By 2040, the UWMP projects 2,000 AFY of additional water conservation through distributed stormwater capture projects offsetting potable water use. These water savings contribute to the overall water conservation goal to meet Mayor's water use reduction targets.

The SCMP investigated potential strategies for advancement of stormwater capture and watershed management in the City, and these numbers are used in the UWMP. The Plan outlines LADWP's strategies over the next 20 years to: (1) implement stormwater programs and projects in the City; and, (2) contribute to more reliable and sustainable local water supplies; and, (3) reduce purchases of imported water to meet goals set in the Mayor's Executive Directive No. 5 and Sustainable City pLAn.

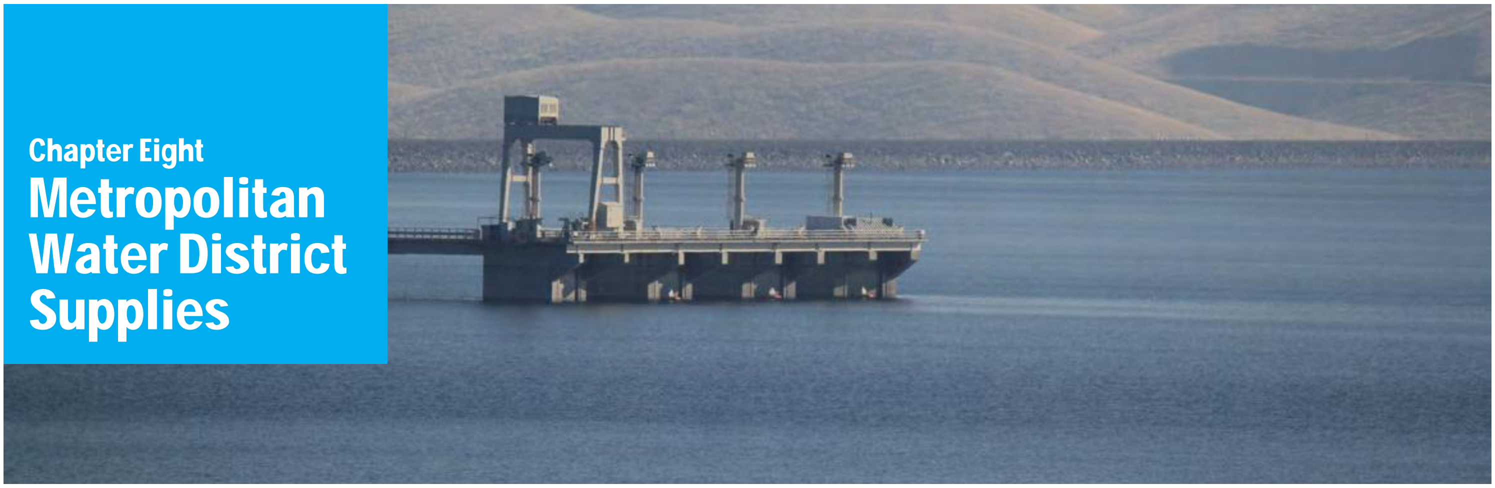
The SCMP analyzed potential capture to determine how much of the inflow to the City could realistically be captured in centralized facilities (e.g. spreading grounds), distributed facilities/infiltration BMPs (e.g. green streets), incidental distributed capture/recharge on pervious land, and direct use storage facilities (e.g. cisterns). This analysis defined two implementation scenarios (Conservative and Aggressive), creating an "envelope" of the range of potential future outcomes.

Existing stormwater recharge is 64,000 AFY. Under the SCMP implementation strategy, LADWP could increase total stormwater capture to 132,000 AFY (Conservative) or 178,000 AFY (Aggressive) by 2035. Capture volumes are summarized in the Exhibit 7F.

Residential Cistern Equipped with Real-Time Controls to Remotely Optimize Rainwater Harvesting Performance.
1,320 Gallon Capacity Dewaters onto a 100 Square Foot Rain Garden.

Chapter Eight

Metropolitan Water District Supplies



San Luis Reservoir

8.0 Overview

As a member agency of the Metropolitan Water District of Southern California (MWD), the City of Los Angeles (City) through the LADWP purchases water to supplement its supplies from local groundwater, the Los Angeles Aqueduct (LAA), and recycled water. LADWP has historically purchased MWD water to make up the deficit between City demands and City supplies. As a percentage of the City's total water supply, MWD purchased water varies from four percent in Fiscal Year Ending (FYE) 1984 to 71 percent in FYE 2015, with the five-year average of 57 percent between FYE 2011 and FYE 2015. Exhibit 1F in Chapter 1 illustrates the City's reliance on MWD water during dry years, and increasingly in recent years, as LAA supply has been cut back for environmental enhancement projects. Although the City plans to reduce its reliance on MWD supply through local supply development and conservation, it has made significant investments in MWD, and will continue to rely on the wholesaler to meet current and future supplemental water needs.

MWD is the largest water wholesaler for domestic and municipal uses in California, providing nearly 19 million people with on average 1.7 billion gallons of water per day to a service area of approximately 5,200 square miles. MWD was formed by the MWD Act and exists pursuant to this statute, which was enacted by the California Legislature in 1927. MWD's purpose is to develop, store, and distribute water to meet the current and future supplemental water needs of Southern California. In 1928, MWD was incorporated as a public agency following a vote by residents in 13 cities in Southern California. Operating solely as a wholesaler, MWD owns and operates the Colorado River Aqueduct (CRA), is a contractor for water from the California State Water Project (SWP), manages and owns in-basin surface storage facilities, stores groundwater within the basin via contracts, engages in groundwater storage outside the basin, and conducts water transfers to provide additional supplies for its member agencies. Today, MWD has 26 member agencies consisting of 11 municipal water districts, one county water authority, and 14 cities, including the City of Los Angeles.

This Urban Water Management Plan (UWMP) projects, through additional local supply development and conservation savings over the next 25 years, that LADWP's reliance on MWD water supplies will be reduced significantly from the current five-year average of 57 percent of total demand to 11 percent under average weather conditions and to 44 percent under single-dry year conditions by FYE 2040.

8.0.1 History

Initially formed to import water into the Southern California region, MWD's first project was to build the CRA to import water from the Colorado River. The City of Los Angeles provided the capital dollars to initiate and complete land surveys of all proposed alignments for the CRA. Construction was financed through $220 million in bond sales during the Great Depression. Ten years after initiating construction, Colorado River water reached Southern California in 1941. To meet further water demands in the southern California region, MWD contracted with the Department of Water Resources (DWR) in 1960 for almost half of the SWP's water supplies, which are delivered from the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta) region into Southern California via the California Aqueduct. After completion of the California Aqueduct, deliveries of SWP water were first received in 1972.

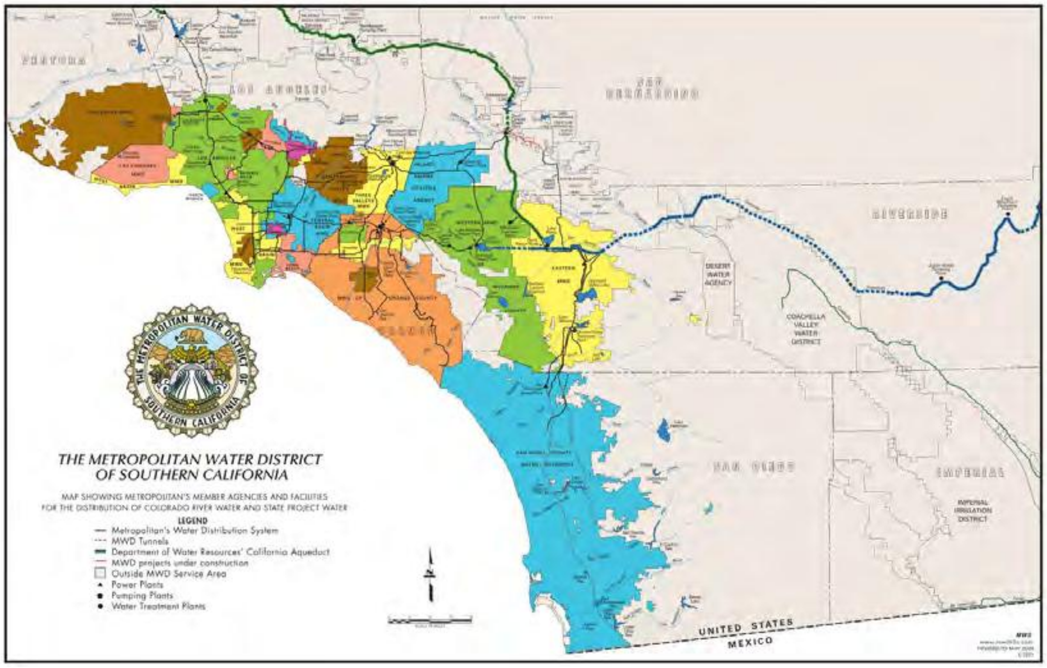
8.0.2 Governance

MWD is governed by a Board of Directors Board composed of 38 individuals with a minimum of one representative from each of MWD's 26 member agencies. The allocation of the directors and voting rights are determined by each agency's assessed valuation. As of August, 2015, the City of Los Angeles has five Directors on MWD's Board and controls 20.11 percent of the vote. MWD's Administrative Code defines various tasks which the MWD Board has delegated to MWD staff. A General Manager oversees MWD staff. The General Manager, General Auditor, General Counsel, and Ethics Officer serve under direction and authority given directly by the MWD Board.

8.0.3 Service Area

Originally serving an area of approximately 625 square miles in 1941 when water service began, MWD's service area has grown to approximately 5,200 square miles serving 19 million people via its 26 member agencies. MWD's service area covers portions of Los Angeles, Ventura, Orange, Riverside, San Bernardino, and San Diego counties as depicted in Exhibit 8A. MWD member agencies serve 152 cities and 89 unincorporated communities. Member agencies provide wholesale, retail, or a combination of wholesale/retail water sales in their individual service territories.

Exhibit 8A
MWD Service Area



Courtesy of the Metropolitan Water District of Southern California

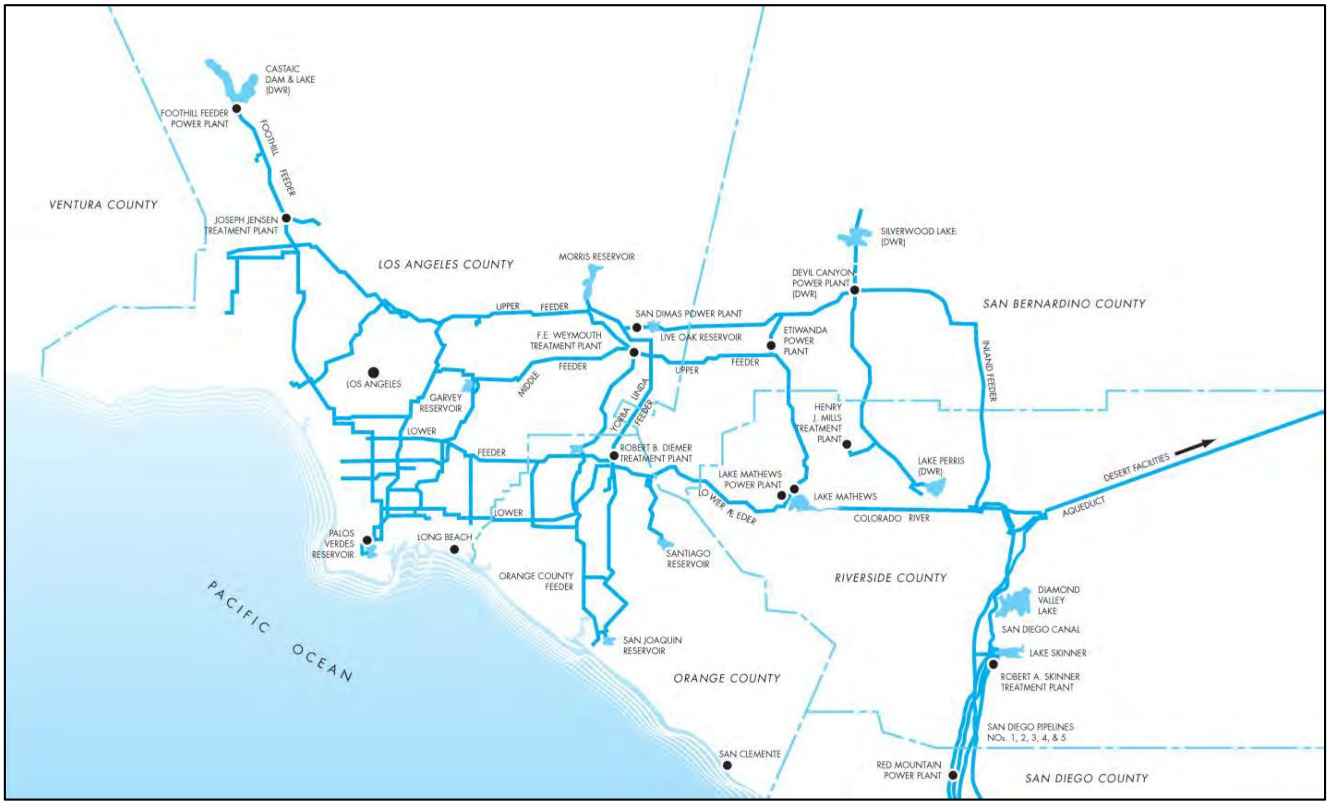
8.0.4 Major Infrastructure

MWD delivers approximately 5,000 AF per day of treated and untreated water to its member agencies through its vast infrastructure network. Major facilities include the CRA, pumping plants, pipelines, treatment plants, reservoirs, and hydroelectric recovery power plants. A summary of the major facilities and capacities are provided in Exhibit 8B, and Exhibit 8C illustrates the geographic locations of the facilities.

Exhibit 8B
Major MWD Facilities Summary

Facility	Units	Capacity
Colorado River Aqueduct		
Aqueduct	242 miles	1.2 million AFY
Pumping Plants	5 plants	1,617 feet of total lift
Distribution Pipelines/Tunnels	830 miles	N/A
Water Treatment Plants		
Joseph Jensen		750 mgd
Robert A. Skinner		630 mgd
F.E. Weymouth		520 mgd
Robert B. Diemer		520 mgd
Henry J. Mills		220 mgd
Total Treatment Capacity		2,640 mgd
Reservoirs		
Diamond Valley Lake		810,000 AF
Lake Matthews		182,000 AF
Lake Skinner		44,000 AF
Copper Basin		24,200 AF
Gene Wash		6,300 AF
Live Oak		2,500 AF
Garvey		1,600 AF
Palos Verdes		1,100 AF
Orange County		212 AF
Total Reservoir Capacity		1,072,000 AF
Hydroelectric Recovery Plants	16 plants	131 megawatts

Exhibit 8C
Major MWD Facilities



Courtesy of the Metropolitan Water District of Southern California

8.1 Supply Sources

Colorado River supplies, State Water Project supplies, Water Transfers, Storage and Exchange Programs together comprise MWD's total system water supply sources. These sources provide supplemental water to meet the demands in Ventura, Los Angeles, Riverside, Orange, San Bernardino and San Diego Counties.

8.1.1 Colorado River

The Colorado River forms California's border with Arizona to the east. The drainage area in California that contributes water to the Colorado River is relatively small and has an arid climate. Accordingly, California has no major tributaries contributing water to the Colorado River.

The Colorado River Board of California (CRB) is the California state agency given authority to protect the interests and rights of the state and its citizens in matters pertaining to the Colorado River. The CRB is comprised of ten gubernatorial appointees representing LADWP, MWD, San Diego County Water Authority, Palo Verde Irrigation District, Coachella Valley Water District, Imperial Irrigation District, California Department of Water Resources, California Department of Fish and Wildlife, and two public members.

8.1.1.1 The Law of the River

As Watermaster, the Secretary of the Interior secretary is vested with the responsibility to manage the mainstream waters of the Colorado River pursuant to applicable federal law. This responsibility is carried out consistent with a body of documents referred to as the Law of the River. Water rights to Colorado River water are governed by a complex collection of federal laws, state laws, a treaty with Mexico, other agreements with Mexico, Supreme Court decrees, contracts with the Secretary, interstate compacts, and administrative actions at the federal and state levels. Collectively, these documents and associated interpretations are commonly referred to as the "Law of the River" and govern water rights and operations on the Colorado River.

Particularly notable among these documents are:

1. The Colorado River Compact of 1922, which apportioned beneficial consumptive use of water between the Colorado River Upper Basin and Lower Basin; and defined the term "States of the Lower Division" to mean the States of Arizona, California, and Nevada. The term "States of the Upper Division" means the States of Colorado, New Mexico, Utah, and Wyoming. Serving as the basis of the "Law of the River", the Compact apportioned water to each basin in anticipation of a dam on the Colorado River. The Upper Basin is the portion of the Colorado River Basin (Basin) upstream of Lees Ferry, Arizona, while the Lower Basin is downstream of this point. Each basin was apportioned 7.5 million acre-feet (MAF) annually, and the Lower Basin received the option to an additional 1 MAF annually based on excess flows. California is within the Lower Basin along with Arizona and Nevada.

2. The Boulder Canyon Project Act (Act) of 1928 was enacted by Congress to authorize construction of Hoover Dam and the All-American Canal, the Act required that water users in the Lower Basin have a contract with the Secretary, and established the responsibilities of the Secretary to direct, manage, and coordinate the operation of Colorado River dams and related works in the Lower Basin. The Act stipulated conditions, one of which required California to limit Colorado River water use to 4.4 MAF annually plus one-half of the excess water unapportioned by the Colorado River Compact. To satisfy the condition, the California Legislature enacted the Limitation Act in 1929 limiting its use of Colorado River water to the basic apportionment of 4.4 MAF.

Colorado River Aqueduct Intake - Whitsett Pumping Plant at Lake Havasu, courtesy of Metropolitan Water District

3. The California Seven Party Agreement of 1931 was developed in response to the Limitation Act and through regulations adopted by the Secretary, established the relative priorities of rights among major users of Colorado River water in California. The Seven Party Agreement apportioned California's share of Colorado River water to California contractors. Within the agreement, priorities were established for each of the four agencies holding contracts for Colorado River water with the U.S. Bureau of Reclamation (USBR). These priorities are shown in Exhibit 8D. Seven priorities were established with the first four priorities satisfying California's allocation of 4.4 MAF annually, the fifth and sixth priorities relating to California's share of excess Colorado River flows and the seventh priority for agricultural use in the Colorado River Basin in California. MWD holds the fourth and fifth priorities. The fourth priority allocates 550 thousand acre-feet (TAF) of California's apportionment to MWD and the fifth priority allocates 662 TAF of California's share of excess flows to MWD.

4. The 1944 Treaty (and subsequent minutes of the International Boundary and Water Commission) related to the quantity and quality of Colorado River water delivered to Mexico. The Treaty guaranteed an annual quantity of 1.5 MAF to be delivered in accordance with the provisions of the Treaty.

5. The 1963 United States Supreme Court Decision in Arizona v. California which confirmed the Lower Basin mainstream apportionments of:

   2.8 million acre-feet per year (AFY) for use in Arizona,

   4.4 million AFY for use in California, and

   0.3 million AFY for use in Nevada, provided water for Indian reservations and other federal reservations in Arizona, California, and Nevada; and confirmed the significant role of the Secretary in managing the mainstream Colorado River within the Lower Basin.

Exhibit 8D
Seven Party Agreement

Listing of Priorities - Seven Party Agreement		
Priority Number	**Agency and Description of Service Area**	**Beneficial Consumptive Use (Acre-feet/year)**
1	Palo Verde Irrigation District - 104,500 acres	3,850,000
2	Yuma Project, California Portion, not exceeding 25,000 acres	
3(a)	Imperial Irrigation District and land in Imperial and Coachella Valleys	
3(b)	Palo Verde Irrigation District - 16,000 acres	
4	Metropolitan Water District of Southern California, City of Los Angeles and/or others on the coastal plain	550,000
5	Metropolitan Water District of Southern California, City of Los Angeles and/or others on the coastal plain	662,000
6(a)	Imperial Irrigation District and land in Imperial and Coachella Valleys	300,000
6(b)	Palo Verde Irrigation District - 16,000 acres of adjoining mesa	
7	Agricultural Use in the Colorado River Basin in California	
	Total	**5,362,000**

6. The 1964 United States Supreme Court Decree (Decree) in Arizona v. California which implemented the Supreme Court's 1963 decision; allocated 50 percent of the surplus water available for use in California; and allowed the Secretary to release water apportioned to, but unused in, one state for use in the other two states. The Decree was supplemented over time after its adoption and the Supreme Court entered a Consolidated Decree in 2006 which incorporates all applicable provisions of the earlier-issued Decrees.

7. The Colorado River Basin Project Act of 1968, which authorized construction of a number of water development projects including the Central Arizona Project (CAP). It provided existing California, Arizona, and Nevada water contractors a priority over the CAP and other users of the same character in Arizona and Nevada whenever less than 7.5 million AFY is available. It also required the Secretary to develop the Long Range Operating Criteria and issue an Annual Operating Plan for mainstream reservoirs.

8.1.1.2 Colorado Supply Reliability

In the past 16 years (2000-2015), there have been only three years in which the Colorado River flow has been above average. The last above-average year was 2011, when the unregulated water year inflow to Lake Powell was 139 percent of average. Drought returned in 2012 with that year's runoff being among the four lowest in the recorded history of the Basin. By the end of November, 2015, the 16-year drought had decreased storage levels in Lake Mead and Lake Powell to 38 percent and 51 percent of capacity, respectively. In 2015, Lake Mead reached its lowest level in history, and the long-term outlook is for continued decline of the reservoir. These factors could reduce the amount of Colorado River water currently available to MWD.

The reliability of CRA water for MWD has decreased overtime due to drought and other factors as well. Historically, California had used up to 5.4 million AFY as Arizona and Nevada were not using their normal apportionments of Colorado River water and surplus water was made available by the Secretary. The 1964 Decree and the 2006 Consolidated Decree of the US Supreme Court in Arizona v. California confirmed California's allocation was limited to 4.4 MAF annually. As a result, MWD can now only rely on its fourth priority allocation of 550 TAF annually. Prior to this, MWD was able to satisfy its fifth priority allocation with Nevada and Arizona's unused water. However, in 1985, Arizona began increasing deliveries to its CAP reducing the availability of unused apportionment to fill MWD's fifth priority.

Because of dry years on the Colorado River system and Arizona and Nevada using their full apportionment, the Secretary asserted that California must come up with a plan to live within its 4.4 MAF apportionment, plus any available surplus water. Therefore, users from California developed California's Colorado River Water Use Plan (California Plan). The users included: MWD, Palo Verde Irrigation District (PVID), Imperial Irrigation District (IID), and Coachella Valley Water District (CVWD). This plan identifies actions that California will take to operate within its 4.4 MAF entitlement.

A component of the California Plan was completion of the Quantification Settlement Agreement (QSA) in 2003, which established baseline water use for each California party with Colorado River water rights. Key to the agreement is the quantification of IID at 3.1 MAF and CVWD at 330 TAF. Completion of the QSA facilitates the transfer of water from agricultural agencies to urban water suppliers by allowing water conserved on farm land to be made available for urban use. On November 5, 2003, IID filed a validation action in Imperial County Superior Court, seeking a judicial determination that the thirteen agreements associated with the QSA are valid, legal, and binding. Other lawsuits also were filed challenging the execution, approval, and subsequent implementation

Exhibit 8E
MWD's CRA Forecast Supplies in 2040, Average Year (1922 - 2012 Hydrology)

Program	Supply (Thousands of AF)/ Year
Current	
Basic Apportionment - Priority 4	550
Imperial Irrigation District/MWD Conservation Program	85
Priority 5 Apportionment (Surplus)	16
Palo Verde Irrigation District Land Management Crop Rotation and Water Supply Program	130
Lower Colorado Water Supply Project	4
Lake Mead Intentionally Created Surplus Storage Program	400
Binational Intentionally Created Surplus	24
Forbearance for Present Perfected Rights	-2
Coachella Valley Water District State Water Project/QSA Transfer Obligation	-35
Desert Water Agency and Coachella Valley Water District SWP Table A Obligation	-118
Desert Water Agency and Coachella Valley Water District SWP Table A Transfer Callback	61
Desert Water Agency and Coachella Valley Water District Advance Delivery Account	57
Southern Nevada Water Authority Agreement Payback	-10
Subtotal of Current Programs	**1,162**
Programs Under Development	
Southern Nevada Water Authority Interstate Banking Agreement	0
Additional Fallowing Programs	25
Subtotal of Proposed Programs	**25**
Additional Non-MWD CRA Supplies	
San Diego County Water Authority/ Imperial Irrigation District Transfer	200
Coachella and All-American Canal Lining	
To San Diego County Water Authority	82
To San Luis Rey Settlement Parties[1]	16
Subtotal of Non-MWD CRA Supplies	**298**
Maximum CRA Supply Capability[2]	**1485**
Minus Supply CRA Capacity Constraint of 1.20 MAF Annually	**-235**
Maximum Forecast CRA Deliveries	**1,200**
Minus Non-MWD Supplies[3]	**-298**
Maximum MWD Supply Capability[4]	**902**

1. Subject to satisfaction of conditions specified in agreement among MWD, the US, and the San Luis Rey Settlement Parties
2. Total amount of supplies available without taking into consideration of CRA capacity constraint of 1.20 MAF annually.
3. Exchange obligation for San Diego County Water Authority - Imperial Irrigation District transfer and the Coachella and All-American Canal Lining Projects
4. The amount of CRA water available to MWD after meeting exchange obligations.

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

of the QSA on various grounds. All of the QSA cases were coordinated in Sacramento County Superior Court. After more than a decade of litigation, the final challenges to the QSA were dismissed, and the agreements were upheld. MWD's existing conservation, land fallowing, and transfer programs for Colorado River supplies are independent of the QSA.

Along with MWD's apportionment, MWD has developed a number of water supply programs to improve the reliability of its Colorado River supplies, such as agricultural water transfers and storage programs. MWD has multiple programs under development as listed in Exhibit 8E. These programs combined with MWD's basic apportionment will provide MWD with approximately 1.16 MAF of Colorado River supplies in 2040 under an average year (1922 – 2012 hydrology). Proposed programs under development could add another 25 TAF per year. Non-MWD supplies conveyed through the CRA are forecast at 298 TAF for a total CRA supply availability of 1.49 MAF under average hydrology. However, the CRA has a conveyance capacity constraint of 1.20 MAF. After subtracting MWD's conveyance obligation of non-MWD supplies, MWD's supplies for 2040 under average year, single-dry year (1977 hydrology), and multi-dry year (1990 – 1992 hydrology) scenarios are all forecast at 902 TAF. Exhibit 8E summarizes the CRA supply forecast for 2040 under an average year.

8.1.1.3 Water Quality Issues

Water quality issues for Colorado River supplies cover high salinity levels, perchlorate, nutrients, uranium, hexavalent chromium (chromium-6), N-nitrosodimethlamine (NDMA), and pharmaceuticals and personal care products (PPCPs). High salinity levels present the most significant issue and the only foreseeable water quality constraint for the Colorado River supply. MWD expects its source control programs for the CRA to adequately address the other water quality issues. MWD has also bolstered its water security measures across all of its operations since 2001, including an increase in water quality tests. Details of MWD's water quality initiatives are available in MWD's 2015 Urban Water Management Plan (UWMP).

Upper Colorado River Basin

Salinity

Water obtained from the Colorado River has the highest salinity levels of all MWD supply sources averaging 630 mg/L since 1976. Salts are eroded from saline sediments deposited in prehistoric marine environments in the Basin, dissolved by precipitation, and conveyed into the Basin's water courses.

Salinity issues have been recognized in the Basin for over 40 years. The seven basin states formed the Colorado River Basin Salinity Control Forum (Forum) to mutually cooperate on salinity issues in the Basin. The Forum recommended the U.S. Environmental Protection Agency (USEPA) to act upon the Forum's proposal, and in response, USEPA approved water quality standards and established numeric criteria for controlling salinity increases. Each basin state adopted the water quality standards, which are designed to limit the flow-weighted average annual salinity level to the 1972 level or below. An outgrowth of the Forum was the Colorado River Basin Control Program. At the core of the program is the reduction in salts entering the river system by intercepting and controlling non-point sources, wastewater, and saline hot springs. Salinity reduction projects have reduced salinity concentration of Colorado River water by over 100 mg/L as a long-term average.

MWD adopted a Salinity Management Policy in 1999 with the goal of achieving salinity concentrations of less than 500 mg/L at delivery. To reduce salinity levels, Colorado River supplies are blended with SWP water supplies to achieve the salinity target. In some years, the target is not possible to achieve as a result of hydrologic conditions that increase salinity on the Colorado River and decrease SWP water available for blending. Additionally, to maximize the use of recycled water for agriculture, MWD attempts to import lower salinity imported water during the spring/summer months to reduce salinity levels in recycled water supplies.

Perchlorate

In 1997, perchlorate was first detected in the Colorado River. It was attributed to an industrial site upstream of the Las Vegas Wash in Nevada which drains to the river. Subsequently, an additional perchlorate plume was found to be migrating from an additional industrial site, but had not reached the Las Vegas Wash. Since the initial discovery of contamination, remediation efforts have significantly reduced perchlorate loading from the Las Vegas Wash. At Lake Havasu, downstream of the convergence of the Las Vegas Wash and Colorado River, perchlorate levels have decreased from 9 μg/L at their peak in 1998 to less than 6 μg/L in October 2002. Since June 2006, typical levels have been less than 2 μg/L.

Nutrients

Excessive nutrient levels in water can stimulate algal and aquatic weed growth leading to taste and odor concerns. Nutrients include both phosphorous and nitrogen compounds. Other impacts of algal and aquatic weed growth include reductions in operating efficiencies and potentially provide an additional food source for invasive aquatic species such as quagga and zebra mussels.

Naturally, the Colorado River system has relatively low concentrations of phosphorous. Additional loading to the system as upstream urbanization increases has the ability to increase phosphorous concentrations and impact MWD's ability to blend low nutrient concentration CRA water with high nutrient concentration SWP water. MWD continues to work with agencies located along the lower Colorado River to improve wastewater management reducing phosphorous loading.

Uranium

Near Moab, Utah, a 16-million ton pile of uranium tailings located approximately 750 feet from the Colorado River is a potential source of uranium loading to 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.

Remedial actions at the site since 1999 have focused on removing contaminated water from the pile and groundwater. To date, over 4,400 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 site began in April 2009, using American Recovery and Reinvestment Act (ARRA) 2009 funding which helped to accelerate initial cleanup efforts. Through August 2015, DOE has shipped over 7.7 million tons of mill tailings to the Crescent Junction disposal cell. DOE estimates completing movement of the tailings pile by 2025, depending on annual appropriations. MWD continues to track progress of the remediation efforts and work with Congressional representatives to support increased annual appropriations and expedite cleanup.

To address recent uranium mining claims in the vicinity of the Colorado River and the Grand Canyon Area, MWD has sent letters to the Secretary of the Interior to highlight MWD's concern of source water protection and recommended close federal oversight. In 2009, the Department of the Interior placed a two-year hold on mining claims for 1 million acres adjacent to the Grand Canyon area to conduct additional analyses. In January 2012, the Department of the Interior placed a 20-year moratorium on new uranium and other hard rock mining claims. The moratorium has been challenged by a number of industry groups and was most recently upheld by a U.S. District Court in September 2014. Meanwhile, local conservation groups continue to defend the moratorium and are seeking additional protection of lands with mines that have been inactive for long periods of time, but may resume operations.

Chromium-6

Chromium-6 has been detected in a groundwater aquifer in the vicinity of the Colorado River near Topock, Arizona. The source of the contamination is a natural gas compression site operated by Pacific Gas and Electric (PG&E) that previously used chromium-6 in its operations. Monitoring levels upstream and downstream of the site, range from non-detect (0.03 µg/L) to 0.06 µg/L which are considered within the background range for the river. MWD is actively involved in the corrective action process through its participation in stakeholder workgroups and partnerships with state and federal regulators, Indian tribes, and other stakeholders. In January 2011, a final treatment remedy was selected, and an Environmental Impact Report (EIR) was certified. In November 2015, PG&E completed the final remedy design based on the selected remedy which involves the installation of an in-situ bioremediation treatment system. In April 2015, California Department of Toxic Substance Control required the preparation of a Subsequent EIR to address new design details. The Subsequent EIR will be completed in February 2017. Construction is expected to be completed in 2019, followed by operation of the treatment system for an estimated 30 years.

NDMA and Pharmaceuticals and Personal Care Products

NDMA is a by-product formed by secondary disinfection of some natural waters with chloramines. MWD is involved in several projects to understand the impact of different treatment processes on NDMA and its precursors at drinking water treatment plants and in distribution systems.

In 2007, MWD initiated monitoring efforts to measure PPCPs in its source supplies. PPCPs have been detected at very low levels (low ng/L level; parts per trillion) consistent with monitoring results from other utilities. Currently, PPCP monitoring is conducted on an annual basis for MWD's source waters and treatment plants. MWD has been actively involved in studies related to PPCPs, including the improvement of analytical methods, and characterization of drinking water sources in California.

8.1.2 State Water Project

MWD began receiving water from the SWP in 1972. MWD is the largest of the 29 SWP contractors, holding a contract for 1.912 MAF per year, or 46 percent of the total contracted amount of the 4.173 MAF ultimate delivery capacity of the project. Variable hydrology, environmental issues, and regulatory restrictions in the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta) have periodically reduced the quantity of water that the SWP delivers to MWD.

Exhibit 8F
Current and Projected Facilities of the State Water Project

Courtesy of the California Department of Water Resources

Exhibit 8G
Table A Maximum Annual SWP Amounts (acre-feet)[1]

Contractor Maximum SWP Table A **North Bay**	
Napa County Flood Control and Water Conservation District	29,025
Solano County Water Agency	47,756
Subtotal	**76,781**
South Bay	
Alameda County Flood Control and Water Conservation District, Zone 7	80,619
Alameda County Water District	42,000
Santa Clara Valley Water District	100,000
Subtotal	**222,619**
San Joaquin Valley	
Oak Flat Water District	5,700
Kings County	9,305
Dudley Ridge Water District	45,350
Empire West Side Irrigation District	3,000
Kern County Water Agency	982,730
Tulare Lake Basin Water Storage District	87,471
Subtotal	**1,133,556**
Central Coastal	
San Luis Obispo County Flood Control and Water Conservation District	25,000
Santa Barbara County Flood Control and Water Conservation District	45,486
Subtotal	**70,486**
Southern California	
Antelope Valley-East Kern Water Agency	144,844
Castaic Lake Water Agency	95,200
Coachella Valley Water District	138,350
Crestline-Lake Arrowhead Water Agency	5,800
Desert Water Agency	55,750
Littlerock Creek Irrigation District	2,300
Mojave Water Agency	85,800
Metropolitan Water District of Southern California	1,911,500
Palmdale Water District	21,300

San Bernardino Valley MWD	102,600
San Gabriel Valley MWD	28,800
San Gorgonio Pass Water Agency	17,300
Ventura County Flood Control District	20,000
Subtotal	**2,629,544**
Delta Delivery Total	**4,132,986**
Feather River	
Butte County	27,500
Plumas County Flood Control and Water Conservation District	2,700
Yuba City	9,600
Subtotal	**39,800**
Total	**4,172,786**

1. Source: DWR's notice "2016 State Water Project Allocation - 15 Percent" dated 01/26/2016.

State Water Project, courtesy of CA Dept. of Water Resources

8.1.2.1 Major State Water Project Facilities

The SWP is owned by the State of California and operated by the Department of Water Resources (DWR) delivering water to two-thirds of the population of California and 750,000 acres of farmland. The SWP system consists of 662 miles of aqueduct, 32 storage facilities (reservoirs and lakes), and 25 power and pumping plants. Exhibit 8F illustrates the location of major SWP facilities. SWP facilities originate in Northern California at Lake Oroville on the Feather River. Water released from Lake Oroville flows into the Feather River, goes downstream to its confluence with the Sacramento River, and then travels into the Bay-Delta. Water is pumped from the Bay-Delta region to contractors in areas north and south of the San Francisco Bay and south of the Bay-Delta. SWP deliveries consist solely of untreated water. In addition to delivering water to its contractors, the SWP is operated to improve water quality in the Bay-Delta region, control flood waters, and provide recreation, power generation, and environmental enhancement.

MWD receives SWP water at three locations: Castaic Lake in Los Angeles County, Devil Canyon Afterbay in San Bernardino County, and Box Springs Turnout at Lake Perris in Riverside County. In addition, MWD has flexible storage rights of 65 TAF at Lake Perris at the terminus of the East Branch of the SWP and 153.94 TAF at Castaic Lake at the terminus of the West Branch.

8.1.2.2 Contract Allocations

Contract allocations, also known as entitlements, for SWP contractors are provided by DWR in a table commonly referred to as "Table A" and shown in Exhibit 8G. Allocations are based on the original projected SWP maximum yield of 4.173 MAF. Table A is a tool used by DWR to allocate fixed and variable SWP costs and yearly water entitlements to the contractors. Table A contract amounts do not reflect actual deliveries a contractor should expect to receive. MWD has a Table A contract amount of 1.912 MAF. MWD's full Table A contract amount was made available to MWD for the first time in 2006.

DWR annually approves the amount of contract allocations SWP contractors will receive. The contract allocation amount received by contractors varies based on contractor demands and projected available water supplies. Variables impacting projected water supplies include snowpack in the Sierra Nevada, capacity available in reservoirs, operational constraints, and demands of other water users. Operational constraints include pumping restrictions related to fish species listed as either threatened or endangered under the federal or state Endangered Species Acts. Contractors' requests for portions of their entitlements cannot always be met. In some years there are shortages and in other years surpluses. In 2014, SWP contractors received only five percent of their SWP contract allocations, a historic low.

DWR bi-annually prepares the State Water Project Delivery Reliability Report to provide contractors with current and projected water supply availability for SWP. In July 2015, DWR released the 2015 State Water Project Delivery Capability Report. The 2015 Delivery Capability Report provides estimates of the current (2015) and future (2035) State Water Project delivery capability for each SWP contractor under a range of hydrologic conditions. These estimates incorporate regulatory restrictions on Delta pumping required by the biological opinions issued by the U.S. Fish and Wildlife Service (December 2008) and National Marine Fisheries Service (June 2009). In addition, these estimates of future capability also reflect potential impacts of climate change and sea level rise.

In addition to MWD's Table A amount, MWD has long-term agreements in place to obtain additional SWP supplies through five other programs:

- Article 21
- Turnback Pool
- Yuba River Accord
- San Luis Carryover Storage
- Desert Water Agency (DWA) and Coachella Valley Water District (CVWD) Table A Transfer

Article 21 is in reference to a provision in the SWP contract with DWR that allows SWP contractors, such as MWD, to take additional water deliveries in addition to Table A amounts. Article 21 water is only available under certain conditions as outlined in Article 21. SWP Article 21 of the contracts permits delivery of water excess to delivery of SWP Table A and some other water types to those contractors requesting it. SWP Article 21 water is apportioned to those contractors requesting it in the same proportion as their SWP Table A amount.

Turnback Pool (Pool) water allows a contractor that has been allocated Table A annual entitlement that the contractor will not use to sell that water to other SWP contractors through the Pool. If there are more requests from contractors to purchase water from the Pool than the amount in the Pool, the water in the Pool is allocated among those contractors requesting water in proportion to their Table A entitlements. If requests to purchase water from the Pool total are less than the amount of water in the Pool, the sale of water is allocated to the selling contractors in proportion to their respective amounts of water in the Pool.

In 2007, MWD and DWR signed an agreement allowing MWD to participate in the Yuba Dry Year Water Purchase Program. Under this program, transfers are available from the Yuba County Water Agency during dry years up to 2025. MWD completed purchases of 14.5 TAF and 10.9 TAF in 2013 and 2014, respectively.

As part of the 1994 Monterey Amendment, which modified the contractors' long-term contracts with DWR, the use of carryover storage by contractors was permitted in the San Luis Reservoir for use during dry years. Carryover storage is curtailed if it impedes the storage of SWP water for project needs.

MWD entered into a transfer agreement with DWA and CVWD for their Table A contract amounts in exchange for an equal amount of water from the CRA. Both DWA and CVWD are SWP contractors, but have no physical connections to obtain SWP water. MWD is able to transfer CRA water to both agencies as a result of their locations adjacent to CRA facilities. DWA and CVWD have a combined Table A amount of 194 TAF per year. MWD additionally can provide DWA and CVWD with deliveries of MWD's other SWP water supplies and non-SWP supplies utilizing SWP facilities, thus allowing MWD additional flexibility in managing its water supply portfolio.

MWD also engages in short-term transfer agreements using SWP facilities to bolster supplies as opportunities become available, as discussed in the Groundwater Storage and Transfers sub-section. Historically, MWD has obtained transfers through the Governor's Water Bank, Dry-Year Purchase Programs, and the State Water Contractors Water Transfer Program.

MWD expects to receive 1.571 MAF through its SWP supplies in 2040, under average conditions (1922 – 2012 hydrology). This projection excludes SWP-related groundwater storage and water transfer programs, covered in a subsequent section of this chapter. Exhibit 8H summarizes MWD's SWP supplies by program. Current programs are expected to result in 1.323 MAF, and programs under development are expected to add an additional 248 TAF. Under multi-dry year (1990 – 1992 hydrology) and single-dry year conditions (1977 hydrology), MWD expects to receive only 566 TAF and 701 TAF, respectively.

Exhibit 8H
MWD Forecast Supplies of SWP Water in 2040 Average Year (1922 - 2012 Hydrology)

Program	Supply (Thousands of AF)
Current	
MWD Table A	976
Desert Water Agency and Coachella Valley Water District SWP Table A Transfer	99
San Luis Carryover Storage[1]	240
Article 21 Supplies	8
Yuba River Accord Purchase	0
Subtotal of Current Programs[2]	**1,323**
Programs Under Development	
Delta Improvements	248
Subtotal of Proposed Programs[2]	248
Maximum SWP Supply Capability[2]	**1,571**

1. Includes carryover water from Desert Water Agency and Coachella Valley Water District.

2. Does not include transfers and water banking associated with SWP.

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

8.1.2.3 Water Quality Issues

Water quality issues for SWP supplies include total organic carbon (TOC), bromide, arsenic, nutrients, NDMA, and PPCPs. TOC and bromide in SWP water present the greatest water quality issues and have restricted MWD's ability to use SWP water at various times as the contaminants form disinfection by-products during water treatment. MWD has upgraded treatment processes to ozone disinfection at four of MWD's treatment plants to reduce formation of disinfection byproducts and lift potential restrictions on SWP water usage. MWD requires low salinity levels of SWP water to meet blending requirements for CRA water, and therefore, any increase in salinity levels in SWP supplies is a concern to MWD.

MWD 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.

MWD is utilizing its water supply portfolio options to conduct water quality exchanges to reduce TOC and bromide. MWD has stored SWP water during periods of high water quality in groundwater storage basins for later use when SWP is at a lower water quality. These storage programs were initially designed to provide water during dry SWP conditions, but a few of these programs are now operated for dual-purposes.

TOC and bromide in high concentrations lead to the formation of disinfection byproducts when source water is treated with disinfectants, such as chlorine. Agricultural drainage to the Bay-Delta and seawater comingling with Bay-Delta supplies increases these contaminants. Ozone disinfection is a very effective treatment for control of bromate formation. MWD has completed upgrades to use ozone as the primary disinfectant at four of MWD's treatment plants, and construction is underway for ozone facilities at the Weymouth water treatment plant.

Arsenic

SWP supplies not banked in MWD's SWP groundwater storage programs naturally contain low levels of arsenic ranging from non-detect to 4.0 µg/L and do not require additional treatment for arsenic removal. SWP supplies banked in at least one of these groundwater storage programs contain arsenic levels close to or at the regulatory threshold of 10 µg/L requiring additional treatment for arsenic removal. Under drought conditions, MWD has further relied on groundwater storage programs and continues to participate in the California Aqueduct Pump-in Facilitation Group to ensure that water quality in the SWP is not adversely affected when considering water supply decisions. Historically, MWD has at times restricted flows from one groundwater storage program as a result of arsenic levels. One groundwater storage partner operates an arsenic treatment facility. Arsenic can also be removed at water treatment plants by increasing coagulant doses. To handle arsenic removed during water treatment processes, MWD has had to invest in solids handling facilities.

Nutrients

Nutrient levels in SWP water are significantly higher than in Colorado River water. Both phosphorous and nitrogen compounds are a concern in SWP water, but similar to CRA supplies, phosphorous is the limiting nutrient. Nutrient sources in SWP water include wastewater discharges, agricultural drainage, and sediments from nutrient rich soils in the Bay-Delta. MWD reservoirs have been temporarily bypassed at times as a result of taste and odor events related to nutrients leading to short-term supply impacts.

MWD is working with other water agencies also receiving SWP water from the Bay-Delta region to reduce the impact of nutrient loading from wastewater plants discharging to the Bay-Delta. To assist in managing its operations, MWD has implemented an algae monitoring and management program designed to provide warnings in advance of algae, taste, and odor issues at its reservoirs allowing adjustments in other system operations.

The Sacramento Regional County Sanitation District (SRCSD), the primary discharger to the Sacramento River, is in the process of constructing wastewater treatment plant upgrades to comply with its 2010 discharge permit requirements for ammonia and nitrate removal. SRCSD expects to complete its EchoWater Project by 2023 and has stated that the project will serve multiple benefits including improving water quality in the Sacramento River. The improvements include a biological nutrient removal process for ammonia and nitrate. In 2014, the City of Stockton Wastewater Treatment Plant, a discharger to the San Joaquin River, was issued a draft permit with a more stringent nitrate discharge limit consistent with the final discharge limits issued in SRCSD's permit. The City of Stockton may have to implement similar plant upgrades as SRCSD to comply with discharge permit requirements.

NDMA and Pharmaceuticals and Personal Care Products

Similar to all of MWD's water supply sources, NDMA and PPCPs are constituents of emerging concern. As described above for Colorado River supplies, MWD is involved with efforts to address both NDMA and PPCPs.

Salinity

Over the long term, salinity concentrations in SWP water are significantly lower than in CRA water, but the timing of supply availability and total dissolved solids (TDS) concentrations can vary in response to hydrologic conditions. Additionally, salinity concentrations vary in the short term in response to seasonal and tidal flow patterns. MWD requires lower salinity SWP water to blend with higher salinity CRA water to meet salinity requirements for its member agencies. MWD's blended salinity objective is 500 mg/L.

Environmental constraints also impact MWD's ability to meet its salinity objective. Since 2007, pumping operations in the Bay-Delta have been limited to prevent environmental harm (as discussed in the Bay-Delta Issues subsection below). MWD must rely on higher salinity CRA water resulting in an exceedance in MWD's salinity objective at times.

SWP salinity concentrations as specified in the SWP Water Service Contract have not been met. Article 19 of SWP Water Service Contract specifies ten-year average TDS concentrations of 220 mg/L and a monthly maximum of 440 mg/L. MWD is working with DWR and other agencies to reduce salinity in SWP Bay-Delta supplies through multiple programs. These programs include modifying agricultural drainages and completing basin plans on the San Joaquin River, modifying levees around flooded islands in the Bay-Delta, and installing gates to reduce transportation of salts from seawater.

8.1.2.4 Bay-Delta Issues

The Bay-Delta is a major waterway at the confluence of the Sacramento and San Joaquin rivers, serving multiple and at times conflicting purposes, exacerbated during dry years when water to meet the needs of both people and the environment is in short supply. Approximately two-thirds of Californians receive at least a portion of their water from the Bay-Delta. Almost all water delivered via the SWP to Southern California must pass through the Bay-Delta. Runoff from more than 40 percent of the state is also conveyed through the Bay-Delta forming the eastern edge of the San Francisco bay's estuary. A large portion of the Bay-Delta region lies below sea level and is protected by more than 1,100 miles of levees to prevent flooding. Deterioration of the Bay-Delta ecosystem coupled with infrastructure concerns, hydrologic variability, climate change, litigation, regulatory restrictions, and previously discussed water quality issues have resulted in supply reliability challenges for SWP contractors who depend upon the Bay-Delta for water supplies.

Environmental

As an estuarine environment, the Bay-Delta provides habitat for migratory and resident fish and birds, including those placed on the threatened or endangered species list under the federal or California Endangered Species Act (ESA). Five fish species residing in the Bay-Delta were listed as endangered under the ESA, and one additional species was listed as threatened in 2009 under the California ESA. As a result of a combination of lawsuits regarding the ESA listed species and biological opinions and incidental take permits (permits for inadvertently harming ESA listed species) from the U.S. Fish and Wildlife Service and National Marine Fisheries Service, SWP exports and pumping operations in the Bay-Delta have been significantly curtailed. DWR has altered the operations of the SWP to accommodate species of fish listed under the ESAs. These changes in project operations have adversely affected SWP deliveries. Between 2008 and 2014, restrictions on Bay-Delta pumping under the biological opinion have reduced deliveries of SWP water by 3 MAF to the state water contractors and by approximately 1.5 MAF to MWD.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented.

Infrastructure

Bay-Delta channels are constrained by a levee system to protect below-sea level islands in the Bay-Delta from flooding. Land in the Bay-Delta subsides mainly from ongoing oxidation of aerated peat soils. Some islands are presently 20 feet or more below sea level. Land subsidence is expected to continue which increases the risk of levee failure and island flooding. Many of the levees are old and do not meet modern engineering standards. A catastrophic earthquake could cause widespread levee failure shutting down SWP operations for an extended period of time. Following a levee failure, the flow of water onto an island can pull saline water from the San Francisco Bay into the central Bay-Delta area and, if coupled with pumping in the south Bay-Delta, could draw saline water into the south Bay-Delta area as well. Therefore, pumping in the south Bay-Delta may need to be stopped or slowed down for an extended period, and additional flows may need to be released from Lake Oroville to flush saline water out of the Bay-Delta. Any salinity introduced into the Bay-Delta may also impact Bay-Delta water quality for an extended period of time.

Recognizing the need for protecting these vulnerable levees, the Bay-Delta Levees Program was formed to coordinate improvements to and maintenance of the Bay-Delta levees. Over the next few years, the DWR and other agencies will conduct a Comprehensive Program Evaluation. This program will supplement existing risk studies, develop a strategic plan, recommend priorities, and provide estimates for the Bay-Delta Levees Program.

8.1.2.5 Delta Plan

Former California Governor Arnold Schwarzenegger established the Delta Vision Process in 2006 to address ongoing Bay-Delta conflicts through long-term solutions. The independent Blue Ribbon Task Force completed their vision for sustainable management of the Bay-Delta in 2008. After delivery of the Delta Vision recommendations and goals, the State Legislature initiated the process to conduct information hearings and draft legislation. Ultimately, the governor called the Seventh Extraordinary Session to address the Bay-Delta and water issues in the state. Resulting legislation included the approval of SB 1 X7 addressing policy reforms and governance of the Bay-Delta.

A key concept of SB 1 X7 is the formation of a Delta Stewardship Council (Council). The Council is an independent state agency tasked to equally further the goals of Bay-Delta restoration and water supply reliability. The Council was required to develop, adopt, and begin implementation of a Delta Plan. The

Delta Plan was adopted on May 16, 2013, and became effective on September 1, 2013. It includes binding regulations as well as nonbinding recommendations intended to ensure progress in areas such as water supply reliability, ecosystem restoration, water quality, flooding, and the economic health of the Bay-Delta. It also includes performance measures for improving water supply reliability and enhancing the Bay-Delta ecosystem. As outlined in the Delta Reform Act (Act), the Bay Delta Conservation Plan (BDCP), if approved as both a Natural Community Conservation Planning (NCCP) program by the state and a Habitat Conservation Plan (HCP) by the federal government, was to be automatically incorporated into the Council's Delta Plan as a necessary component to further the achievement of the state-mandated coequal goals – water supply reliability for California and the rehabilitation of the Bay-Delta ecosystem. The BDCP was a joint effort of state and federal fish agencies; state, federal, and local water agencies; environmental organizations; and other parties with the goal of providing for both improvements in water reliability through securing long-term permits to operate the SWP and species/habitat protection in the Bay-Delta. MWD was a member of the Steering Committee.

Canals of the Bay-Delta, courtesy of CA Dept. of Water Resources

The draft BDCP and the associated draft environmental impact report/environmental impact statement (EIR/EIS) were made available to the public for review on December 13, 2013. Comments for these documents were due on July 29, 2014. On December 19, 2014, the Brown administration and its federal partners announced several significant changes to the water conveyance portion of the BDCP, including the elimination of three pumping plants, to respond to concerns of Bay-Delta landowners and others.

On April 30, 2015, state and federal agencies proposed a new sub-alternative, Alternative 4A (California WaterFix), to replace Alternative 4 (the proposed BDCP) as the state's proposed project. Alternative 4A reflected the state's proposal to separate the conveyance facility and habitat restoration measures into two separate efforts: California WaterFix and California EcoRestore. With this change, there will be no automatic incorporation of the BDCP into the Delta Plan, and WaterFix will be a "covered action" that must be consistent with the regulatory provisions of the Delta Plan.

California WaterFix and EcoRestore would be implemented under different federal and state ESA regulatory permitting processes (Section 7 versus Section 10(a) of the federal ESA, and pursuant to section 2081 of the state ESA instead of the Natural Community Conservation Planning Act). This would fulfill the requirement of the 2009 Delta Reform Act to contribute toward meeting the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Bay-Delta ecosystem.

The new water conveyance facilities would be constructed and operated under the California WaterFix, which proposes design changes to the water conveyance facilities. Refinements to the design reduce the overall environmental/construction impacts, and increase long-term operational and cost benefits. Some of the engineering configuration improvements include moving the tunnel alignment away from local communities and environmentally sensitive areas. Reconfiguration of intake and pumping facilities lessen construction impacts in local communities and longer-term operational impacts.

The main objective under the EcoRestore Program is the initial restoration of at least 30,000 acres of Bay-Delta habitat, with the near-term goal of making significant strides toward that objective by 2020. These restoration programs would include projects and actions that are in compliance with preexisting regulatory requirements designed to improve the overall health of the Bay-Delta. Other priority restoration projects would also be identified by the Sacramento-San Joaquin Delta Conservancy and other agencies and local governments.

The environmental analysis of California WaterFix, as well as two other additional alternatives, and updated information from the 2013 BDCP Draft EIR/EIS were included in the BDCP/California WaterFix Partially Recirculated Draft EIR/Supplemental Draft EIS (RDEIR/SDEIS). The RDEIR/SDEIS was released for public review on July 10, 2015. The comment period ended on October 30, 2015. The final planning documents are expected to be completed in the spring of 2016.

8.1.3 In-Basin Storage

In-basin storage facilities play a key role in maintaining MWD's reliability during droughts or other imported water curtailments and emergency outages. In-basin storage facilities consist of surface reservoirs and contracted groundwater basin storage. Conjunctive use of surface reservoirs and groundwater basins was first initiated by MWD in the 1950's. Long-term storage goals for in-basin storage facilities were established in MWD's Water Surplus and Drought Management Plan (WSDM). The WSDM plan allows storage for hydrology variances, water quality, and SWP and CRA issues.

MWD has established emergency in-basin storage requirements based on a major earthquake that could potentially cutoff all supplies for six months from all aqueducts serving the region: the CRA, both SWP branches, and LADWP's LAA. Under this scenario, MWD would maintain deliveries by suspending interruptible deliveries, implementing mandatory water use reductions of 25 percent of normal-year demands, making available water from surface reservoir and groundwater supplies stored as part of MWD's interruptible supply program, and implementing full local groundwater production. MWD's emergency storage requirement is a function of projected demands and varies with time.

8.1.3.1 Surface Reservoirs

MWD owns and operates seven in-basin surface storage reservoirs. Four of the reservoirs, Live Oak, Garvey, Palos Verdes, and Orange County, are used for regulatory purposes and do not provide drought or emergency storage. Additionally, MWD owns and operates two reservoirs, Copper Basin and Gene Wash, along the CRA outside of the basin for system regulation purposes. Outside its basin, MWD has 1.5 MAF of storage rights in Lake Mead on the Colorado River pursuant to its intentionally created surplus agreement with the USBR. MWD also has storage rights in DWR's SWP terminal reservoirs, Lake Perris and Castaic Lake, as previously discussed. The total capacity of all in-basin surface reservoirs, inclusive of the rights in the terminal reservoirs, is 1.26 MAF, as itemized in Exhibit 8I.

MWD operates its three main storage reservoirs, Diamond Valley Lake, Lake Skinner and Lake Matthews, for dry-year, emergency, and seasonal storage.

Exhibit 8I
MWD's In-basin Surface Reservoir Capacity

Reservoir	Capacity (AF)
Dry Year/Emergency/Seasonal Storage Purposes	
Diamond Valley Lake	810,000
Lake Matthews	182,000
Lake Skinner	44,000
Lake Perris (Storage Rights)[1]	65,000
Castaic Lake (Storage Rights)[1]	153,940
Subtotal	**1,254,940**
Regulatory Purposes	
Live Oak, Garvey, Palos Verdes, and Orange County	3,500
Total Reservoir Capacity	**1,258,440**

1. MWD holds storage rights for flexible use in DWR terminal storage facilities, Lake Perris and Castaic Lake. In addition, MWD has emergency storage of 334 TAF in DWR's reservoirs.

Exhibit 8J
MWD Forecast Supplies of In-Basin Surface Storage Supplies in 2040, Average Year (1922 - 2012 Hydrology)

Program	Supply (Thousands of AF)/Year
In-Basin Surface Storage (Diamond Valley Lake, Lake Skinner, Lake Matthews)	624
Lake Perris and Castaic Lake MWD Storage Rights	190
Maximum MWD Supply Capability	814

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

Under an average-year scenario for 2040 (1922-2012 hydrology), 814 TAF per year of in-basin surface storage is projected to be available, exclusive of emergency supplies, as shown in Exhibit 8J.

MWD reserves a portion of its in-basin surface reservoir storage capacity for emergencies. MWD's emergency surface reservoir storage portfolio is split between storage in its three main reservoirs and DWR reservoirs. MWD's emergency storage capacity, based on demands for 2040, is forecast to be approximately 646 TAF. Approximately 312 TAF is projected to be stored in MWD's facilities and the balance of 334 TAF in DWR's facilities. The balance of available storage capacity, 939 TAF, is for dry-year and seasonal storage.

Any additional reservoir capacity is used for seasonal storage and system operations. Seasonal storage is required to meet peak demands. MWD incorporates reserves of five percent into reservoir operations to account for imported water transmission infrastructure maintenance that would restrict or temporarily halt imported water flows.

8.1.3.2 Contracted Groundwater Basin Storage

To improve reliability, MWD engages in contracted groundwater basin storage within the basin area. MWD has worked with local water agencies to increase groundwater storage and has implemented conjunctive water use through various programs. Groundwater storage occurs using the following methods:

- Direct delivery – Water is delivered directly by MWD to local groundwater storage facilities through the use of injection wells and spreading basins.

- In-lieu delivery – Water is delivered directly to a member agency's distribution system and the member agency uses the delivered water and forgoes pumping, allowing water to remain in storage.

MWD engages in two main types of storage programs: cyclical and conjunctive use. These programs are designed to deliver water to agencies prior to the actual need for the demands, allowing MWD to store supplies for use in dry years. Since 2007, MWD has used these programs to address SWP shortages. MWD provides financial incentives and funding to assist agencies with developing storage programs.

Cyclic storage contracts allow surplus imported water to be delivered for recharge in advance of the actual water purchase. The delivered water is in excess of an agency's planned and budgeted deliveries. The agency purchases the water at a later time when it has a need for groundwater replenishment deliveries.

Conjunctive use contracts allow MWD to request an agency to withdraw previously stored MWD water from storage during dry periods or emergencies. Agencies must pay MWD the current water rate when they are requested to withdraw water from storage. Water withdrawn from storage allows MWD to temporarily curtail deliveries by an equal amount. MWD currently has nine conjunctive use programs with a combined storage capacity of 211.9 TAF and a dry-year yield of 70.3 TAF per year, as summarized in Exhibit 8K.

MWD prepared a Groundwater Assessment Study in 2007 in conjunction with local agencies and groundwater basin managers. As indicated in the report, there is substantial groundwater storage available in the basin, but there are multiple challenges that must be met to utilize the identified storage. Challenges include infrastructure limitations, contamination, legal issues and funding.

The MWD Board recently approved a joint study with Sanitation Districts of Los Angeles County on the feasibility of a regional recycled water project to purify and reuse wastewater for the recharge of groundwater basins and to augment water supplies within the Southern California region. The study includes a demonstration plant to verify treatment design parameters for a full-scale project, a feasibility study to determine the parameters of the delivery system and a comprehensive finance plan. At full

Exhibit 8K
In-Basin Conjunctive Use Programs

Program	Storage Capacity	Dry-Year Yield	Balance 12/31/15 Estimated
	(Thousands of AF)	(Thousands of AF/Year)	(Thousands of AF)
Los Angeles County			
Long Beach Conjunctive Use Project	13.0	4.3	6.4
Foothill Area GW Storage Project	9.0	3.0	0.6
Long Beach Conjunctive Use Project: Expansion in Lakewood	3.6	1.2	1.8
City of Compton Conjunctive Use Program	2.3	0.8	0.0
Upper Claremont Heights Conjunctive Use	3.0	1.0	0.0
Orange County			
Orange County GW Conjunctive Use Program	66.0	22.0	8.6
San Bernardino County			
Chino Basin Programs	100.0	33.0	23.0
Live Oak Basin Conjunctive Use Project	3.0	1.0	0.7
Riverside County			
Elsinore Groundwater Storage Program	12.0	4.0	0.0
Total	**211.9**	**70.3**	**41.1**

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

Exhibit 8L
MWD Forecast Supplies of In-Basin Groundwater Storage in 2040, Average Year (1922 - 2012 Hydrology)

Program	Current Supply (Thousands of AF/Year)
Conjunctive Use	68
Cyclic Storage	110
Maximum MWD Supply Capability	178

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

build-out, this project could provide up to 150 million gallons per day of purified water for the region. Exhibit 8L provides a summary of forecast groundwater storage supplies available in 2040 under an average year (1922 -2012 hydrology). Approximately 178 TAF per year are forecast to be available.

8.1.4 Groundwater Storage and Water Transfers

MWD engages in groundwater storage outside of the basin and water transfers to increase the reliability of SWP dry-year supplies. Groundwater storage and water transfers were initiated by MWD in response to concerns that MWD's supply reliability objectives could not be met by the SWP. Groundwater storage and transfer programs were developed to allow MWD to reach its SWP reliability goal. All groundwater storage and water transfer programs designed to bolster SWP reliability are located within the vicinity of the SWP or Central Valley Project (CVP) facilities to facilitate the ultimate delivery of water to MWD. Groundwater storage programs involve agreements allowing MWD to store its SWP contract Table A water in excess of MWD demands and to purchase water for storage. MWD calls for delivery of the stored water during dry years. Transfers involve purchases by MWD from willing sellers when necessary.

Exhibit 8M summarizes MWD's out-of-basin groundwater storage and transfer programs supplies in 2040, under an average year (1922 – 2012 hydrology). Current programs are expected to deliver 309 TAF in 2040. One program under development is forecasted to deliver an additional 20 TAF, for a total of 329 TAF in 2040.

8.1.4.1 Groundwater Storage

MWD has four Central Valley groundwater storage programs with a fifth program under development as described below.

The Semitropic Water Banking and Exchange Program (Semitropic Program) is a partnership formed in 1994 between Semitropic Water Storage District, MWD, and five other banking partners. The bank has a total storage capacity of 650 TAF, of which MWD has 350 TAF of storage volume. During years of excess SWP deliveries, beyond MWD's demands, a portion of MWD's SWP entitlement water is stored for withdrawal during dry years. Deliveries for storage are transferred via SWP facilities for direct use by agricultural users that in turn forgo pumping an equal volume of water. In dry years, water is pumped from storage to SWP facilities for delivery to MWD or entitlements are exchanged. MWD's average annual supply capability for a dry year (1977 hydrology) is 125 TAF and for multiple-dry years (1990 – 1992 hydrology) is 107 TAF. The program expects to have 140 TAF in its storage account by the end of 2015.

Exhibit 8M
MWD Forecast Supplies of Groundwater Storage and Transfers in 2040, Average Year (1922 – 2012 Hydrology)

Program	Supply (Thousands of AF/Year)
Current	
San Bernardino Valley MWD Minimum Purchase	20
San Bernardino Valley MWD Option Purchase	16
San Gabriel Valley MWD Exchange and Purchase	2
Central Valley Storage and Transfers	
Semitropic Water Banking and Exchange Program	70
Arvin-Edison Water Management Program	75
Mojave Groundwater Storage Program	26
Kern Delta Water Management Program	50
Transfers and Exchanges	50
Subtotal of Current Programs	**309**
Programs Under Development	
Antelope Valley/East Kern Acquisition and Storage	20
Subtotal of Proposed Programs	**20**
Maximum Supply Capability	**329**

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

Since 1997, MWD has had an agreement with Arvin-Edison Water Storage District to use 350 TAF of storage in its groundwater basins. The agreement was amended in 2008 to include the South Canal Improvement project to deliver higher quality water to MWD. During wet years, MWD delivers SWP water in excess of its demands for storage and receives return water in dry years in a similar manner as the Semitropic Program, except a combination of SWP and CVP facilities are used to transfer the water, and water can be stored by a combination of direct spreading or in lieu-use by agricultural users. MWD's average supply capability is 75 TAF for either a single-dry year (1977 hydrology) or multiple-dry years (1990 – 1992 hydrology). The program expects to have 140 TAF in its storage account by the end of 2015.

MWD entered into an agreement with the Kern Delta Water District (Kern-Delta) for the Kern-Delta Water Management Plan in 2001 to allow up to 250 TAF of groundwater storage. During wet years, MWD delivers SWP water in excess of its demands for storage and receives return water in a similar manner as the Semitropic Program, except the water can be stored by direct recharge or in lieu-use by agricultural users. Per terms of the agreement, MWD can potentially store beyond 250 TAF. When needed, MWD can recover its stored water either through direct pumping of the groundwater or exchange at a rate of 50 TAF per year. The program expects to have 120 TAF in its storage account by the end of 2015.

MWD entered into a groundwater banking and exchange transfer agreement with Mojave Water Agency on October 29, 2003. This agreement was amended in 2011 to allow for the cumulative storage of up to 390 TAF. The agreement allows for MWD to store water in an exchange account for later return. Through 2021, and when the SWP allocation is 60 percent or less, MWD can annually withdraw the Mojave Water Agency's SWP contractual amounts in excess of a ten percent reserve. When the SWP allocation is over 60 percent, the reserved amount for Mojave's local need increases to 20 percent. Under a 100 percent allocation, the State Water Contract provides Mojave Water Agency 82.8 TAF of water.

In November 2015, the MWD Board authorized entering into agreements with Antelope Valley-East Kern Water Agency (AVEK) to develop exchange and storage programs for SWP supplies. The AVEK Program allows MWD to both exchange and store SWP supplies to provide additional water for normal and dry-year needs. Under this program, AVEK provides MWD its unused SWP supplies. For every two acre-feet provided by AVEK, MWD will return one acre-foot. The exchange program is expected to deliver 30 TAF over ten years, with 10 TAF available in dry years. MWD will also have a storage capability in the groundwater basin, with a capacity of 30 TAF, and a dry-year return capability of 10 TAF. MWD's average annual supply capability for a dry year (1977 hydrology) is 10 TAF for each program and for multiple-dry years (1990 – 1992 hydrology) is 3 TAF for each program. The AVEK Program is projected to provide benefits starting as early as 2016.

8.1.4.2 Transfers

MWD utilizes Central Valley water transfers to obtain additional supplies originally destined for agricultural users on an as-needed basis. Past transfer agreements have used both spot market and option contracts. Spot markets occur when there are willing sellers and buyers. Option contracts lock-in MWD's ability to have the option to purchase supplies, if needed. Additionally, MWD has multiple long-term transfer programs under development. MWD's ability to conduct transfers and the amount of water to be transferred using SWP facilities are a function of hydrologic conditions, market conditions, and pumping restrictions in the Bay-Delta region. Transfers may require the use of the Bay-Delta for conveyance dependenting on the origin of the water. Historic transfers, as listed in Exhibit 8N, indicate MWD is capable of negotiating contracts with agricultural districts and the state's Drought Water Bank to obtain transfers. MWD also has demonstrated it can work with DWR and USBR. Cooperation of both agencies is required as transfers use a combination of DWR's SWP and USBR's CVP facilities. Transfers from north of the Bay-Delta result in the loss of approximately 20 percent of the water during conveyance, while transfers via the California Aqueduct to MWD's service area result in the loss of three percent water during conveyance.

8.2 MWD Supply Reliability and Projected LADWP Purchases

MWD's 2015 Integrated Water Resources Plan (IRP) update serves as the foundation for supply forecasts discussed in its UMWP and continues to ensure system reliability for its member agencies. The 2015 IRP update concluded that the resource targets identified in previous updates, taking into consideration changed conditions identified since that time, will continue to provide for 100 percent reliability through 2040. MWD's subsequent 2015 draft UWMP also concluded the same full reliability during average (1922 – 2012 hydrology), single-dry (1977 hydrology), and multiple-dry years (1990 - 1992 hydrology). For each of

Exhibit 8N
MWD Historic Central Valley Water Transfers

Program	Purchases by MWD[1] (AF/Year)
1991 Governor's Water Bank	215,000
1992 Governor's Water Bank	10,000
1994 Governor's Water Bank	100
2001 Dry Year Purchase Program	80,000
2003 MWD Transfer Program	126,230
2005 State Water Contractors Water Transfer Program[2]	0
2008 State Water Contractors Water Transfer Program	26,621
2009 Governor's Water Bank	36,900
2010 State Water Contractors Water Transfer Program	88,159
2013 Multi-Year Water Pool Demo	30,000
2015 Multi-Year Water Pool Demo	1,374
2015 State Water Contractors Water Transfer Program	12,358

1. Transfers requiring use of Bay-Delta result in a water loss of approximately 20 percent. Transfers requiring the California Aqueduct for delivery to MWD's service area result in a 3 percent water loss.
2. 127,275 in options were secured, but not needed.

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

the scenarios, there is a surplus in every forecast year. Exhibit 8O summarizes MWD's reliability in five-year increments extending to 2040.

The City purchases MWD water to make up the deficit between demand and other City supplies. Whether LADWP can provide reliable water services to the residents of Los Angeles is highly dependent on MWD's assurance on supply reliability.

The reliability of MWD's water supply is more fully discussed in Chapter 10, Integrated Resources Planning. The projected LADWP water purchase is further discussed in Chapter 11, Water Service Reliability and Financial Integrity, under various weather scenarios.

Exhibit 80
MWD System Forecast Supplies and Demands, Average Year (1922 - 2012 Hydrology)

Forecast year	Supply (Thousands of AF per Year)				
	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	693	774	852	956	992
State Water Project[1]	1,555	1,576	1,606	1,632	1,632
Colorado River Aqueduct					
Colorado River Aqueduct Supply[2]	1,468	1,488	1,484	1,471	1,460
Aqueduct Capacity Limit[3]	1,200	1,200	1,200	1,200	1,200
Colorado Aqueduct Capability	1,200	1,200	1,200	1,200	1,200
Capability of Current Programs	**3,448**	**3,550**	**3,658**	**3,788**	**3,824**
Demands					
Total Demands on MWD	1,586	1,636	1,677	1,726	1,765
Imperial Irrigation District - San Diego County Water Authority Transfers and Canal Linings[4]	274	282	282	282	282
Total Demands on MWD	**1,860**	**1,918**	**1,959**	**2,008**	**2,047**
Surplus	**1,588**	**1,632**	**1,699**	**1,780**	**1,777**
Programs Under Development					
In-Region Supplies and Programs	43	80	118	160	200
State Water Project	20	20	268	268	268
Colorado River Aqueduct					
Colorado River Aqueduct Supply	5	25	25	25	25
Aqueduct Capacity Limit[2]	0	0	0	0	0
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Programs Under Development	**63**	**100**	**386**	**428**	**468**
Maximum MWD Supply Capability	**3,511**	**3,650**	**4,044**	**4,216**	**4,292**
Potential Surplus	**1,651**	**1,732**	**2,085**	**2,208**	**2,245**

1. Includes water transfers and groundwater banking associated with SWP.

2. Includes 296 TAF of non-MWD supplies conveyed in CRA for Imperial Irrigation District - San Diego County Water Authority Transfers and Canal Linings

3. CRA has a capacity constraint of 1.20 MAF per year.

4. Does not include 16 TAF subject to satisfaction of conditions specified in agreement among MWD, the US, and the San Luis Rey Settlement

Source: 2015 Urban Water Management Plan, Metropolitan Water District of Southern California

8.3 LADWP's Costs for Purchased Water

8.3.1 MWD Rate Structure

MWD's rates are structured on a tier–based system with two tiers. Eight major elements determine the actual price a member agency will pay for deliveries. All of the elements are volumetric-based except for two fixed rates, the Readiness-to-Serve Charge and the Capacity Charge.

The costs of maintaining existing supplies and developing additional supplies are recovered through the two-tiered pricing approach. The Tier 1 Supply Rate recovers the cost of maintaining a reliable amount of supply. Each member agency has a predetermined amount of water that can be purchased at the lower Tier 1 Supply Rate. Purchases in excess of this limit will be made at the higher Tier 2 Supply Rate. The Tier 2 Supply Rate reflects MWD's cost of purchasing water transfers north of the Bay-Delta. The Tier 2 Supply Rate encourages the member agencies and their customers to maintain existing local supplies and develop cost-effective local supply resources and conservation.

Exhibit 8P summarizes the rates and charges for member agencies effective on January 1 of 2014, 2015, and 2016.

Exhibit 8P
MWD Rates and Charges

Rates and Charges	Effective Rate January 1		
	2014	2015	2016
Tier 1 Supply Rate ($/AF)	148	158	156
Tier 2 Supply Rate ($/AF)	290	290	290
System Access Rate ($/AF)	243	257	259
Water Stewardship Rate ($/AF)	41	41	43
System Power Rate ($/AF)	161	126	138
Full Service Untreated Volumetric Cost ($/AF)			
Tier 1	593	582	594
Tier 2	735	714	728
Treatment Surcharge ($/AF)	297	341	348
Full Service Treated Volumetric Cost ($/AF)			
Tier 1	890	923	942
Tier 2	1032	1055	1076
Treated Replenishment Water ($/AF)	558	601	651
Treated Interim Agricultural Water Program ($/AF)	615	687	765
Readiness-to-Serve Charge ($ Million)	166	158	153
Capacity Charge ($/cfs)	8,600	11,100	10,900

Source:2015 Urban Water Management Plan, Metropolitan Water District of Southern California

8.3.2 LADWP's Purchased Water Costs

MWD's water rates vary from $594 per AF of tier 1 untreated water to $1,076 per AF of tier 2 treated water in 2016. The average unit cost of MWD water supply depends on the proportions of treated water and untreated water, tier 1 water, and tier 2 water purchased in a given period. Exhibit 8Q illustrates the various levels of tier 1 and tier 2 purchases by LADWP over the past seven years.

The Readiness-to-Serve Charge and Capacity Charge are predetermined fixed charges for each member agency and not affected by the quantity of MWD water purchased. However, they add on to the unit cost of the City's MWD water purchase. The City's share of the Readiness-to-Serve Charge is 17.36 percent, or $26.57 million in 2016. The Capacity Charge is calculated based on the maximum 3-year peak day demand placed by a member agency on MWD's distribution system between May 1 and September 30 and is applied with a one year lag. The City's 2016 Capacity Charge is $8.53 million based on the daily peak flow of 782.5 cfs in summer 2014. Both charges will add $35.1 million to LADWP's MWD water purchase in 2016.

Exhibit 8Q
Percentage of LADWP's Purchased Water in Various MWD Rate Categories

MWD Deliveries	**Tier 1**		**Tier 2**		**Total Tier 1**	**Total Tier 2**	**Total Untreated**	**Total Treated**
Calendar Year	**Untreated**	**Treated**	**Untreated**	**Treated**				
	%	**%**	**%**	**%**	**%**	**%**	**%**	**%**
2009	66%	20%	10%	3%	87%	13%	76%	24%
2010	62%	38%	0%	0%	100%	0%	62%	38%
2011	45%	55%	0%	0%	100%	0%	45%	55%
2012	73%	21%	3%	4%	94%	6%	75%	25%
2013	58%	18%	19%	4%	77%	23%	78%	22%
2014	65%	20%	12%	3%	86%	14%	77%	23%
2015	80%	20%	0%	0%	100%	0%	80%	20%
Seven-year AVERAGE	61%	27%	9%	2%	88%	12%	70%	30%

Chapter Nine

Other Water Supplies

Proposed Site for Discontinued Desalination Pilot Project: Scattergood Generating Station

9.0 Overview

LADWP continually investigates potential water supplies that may diversify and expand the City of Los Angeles' water supply portfolio for improved reliability. LADWP has actively pursued or investigated various supply options including water transfers, water banking, brackish groundwater recovery, and seawater desalination. Evaluating the viability of these and other water resource options is a key element to ensuring the City's future water supply reliability, sustainability, and cost-effectiveness. Such options, with proper planning, can contribute toward fulfilling future demand under various conditions. Future water resource challenges, which include increased demand that must be met without increasing imported supply, warrant thoughtful consideration of these and other feasible water supply resources.

The following is a discussion of other water resource options as mentioned above, highlighting LADWP's efforts in developing each alternative source of water. Also discussed are factors that affect feasibility and influence potential implementation, as well as advances that facilitate development of each resource option.

9.1 Water Transfers and Banking

Water transfers involve the lease or sale of water or water rights between consenting parties. Water Code Section 470 (The Costa-Isenberg Water Transfer Act of 1986) states that voluntary water transfers between water users can result in a more efficient use of water, benefiting both the buyer and the seller. The State Legislature further declared that transfers of surplus water on an intermittent basis can help alleviate water shortages, save capital outlay development costs, and conserve water and energy. This section of the Water Code also obligates the California Department of Water Resources (DWR) to facilitate voluntary exchanges and transfers of water.

DWR is required to establish an ongoing program to facilitate the voluntary exchange or transfer of water and implement the various State laws that pertain to water transfers. In response to this mandate, DWR established an internal office dedicated specifically to water transfers in June 2001 and has developed various definitions and policies for transfers. Of particular importance are the rules protecting existing water rights. Water rights cannot be lost when they are transferred to another user if the transferor has an underlying right to the transferred water. DWR also developed three fundamental rules specifically regarding water transfers:

- There can be no injury to any legal user of water.

- There can be no unreasonable effect on fish and wildlife.

- There can be no unreasonable economic effects to the economy in the county of origin.

Voluntary exchanges and transfers of water may or may not require approvals from State agencies dependent on the supply sources and facilities utilized for conveyance. Water transfers involving State Water Project (SWP) or Central Valley Project (CVP) facilities, water, or contractors requires approval of DWR. SWRCB manages water transfers involving surface waters that the State has jurisdiction over.

The Governor's Executive Orders issued on January 17, 2014, April 25, 2014, and December 22, 2014 known as the Drought Proclamation has expedited the processing of water transfers through DWR and the SWRCB. Through the Executive Orders, certain California Environmental Quality Act (CEQA) requirements for actions by DWR and SWRCB related to water transfers have been suspended. However, CEQA compliance on behalf of local agencies is still required to facilitate transfers.

Water banking, a form of conjunctive use, is the storage of water in groundwater basins for future use. Typically, during wet periods water is stored or banked within groundwater basins for potential extraction during dry periods. Water banking sets up accounts to track the volumes of water recharged and extracted per terms of contract agreements between water agencies. Water banking may occur outside of a water agency's service area. If the water agency's own conveyance facilities are not directly adjacent to the water bank, stored water can be extracted and transferred through wheeling and exchange via other conveyance and storage facilities. Such movements of water involve institutional transfer agreements among water users and agencies.

9.1.1 LADWP Opportunities

LADWP plans on acquiring water through transfers to replace a portion of the Los Angeles Aqueduct (LAA) water used for environmental enhancements in the eastern Sierra Nevada. The City would purchase water when available and economically beneficial for storage or delivery to LADWP's transmission and distribution system. The City is seeking non-SWP water to replace the reallocation of LAA water supply for environmental enhancements. MWD holds an exclusive contractual right to deliver SWP entitlement water into its service territory, which includes the City of Los Angeles. Purchasing only non-SWP supplies will ensure the City's compliance with MWD's SWP contract.

To facilitate water transfers, LADWP is constructing an interconnection between the LAA and the SWP's California Aqueduct, located where the two aqueducts intersect in the Antelope Valley (see Exhibit 9A). This interconnection, the Neenach Pumping Station, will allow for water transfers from the East Branch of the SWP to the LAA system, as well as provide operational flexibility in the event of a disruption of flows along the LAA System. Currently, construction of the infrastructure is complete and ongoing work is focused on bringing the pumps and equipment online. Operation of the Neenach Pumping Station is expected in 2017/18. Construction of the Neenach Pumping Station required a four-way agreement between DWR, MWD, LADWP, and the Antelope Valley-East Kern Water Agency (AVEK). When completed, the Neenach Pumping Station facility will be designated an AVEK interconnection that is operated by LADWP. MWD is involved in the agreement to provide consent for the transferred water to enter its service territory. The pump station may also be operated as an MWD connection via a separate coordinated use agreement, Agreement 47396-5.

LADWP's current goal is to transfer up to 40,000 Acre-Feet per Year (AFY) once the Neenach Pumping Station facilities are in place. This will provide LADWP with the ability to replace some LAA supplies that have been reallocated, pursuant to legally binding obligations, to environmental enhancement projects in the Mono Basin and Owens Valley. This will also provide increased operational flexibility and cost savings for LADWP customers.

A demonstration study will be performed during the Neenach Pumping Station's first two years of operations. This study will include an evaluation of the operational and water quality impacts of the Neenach Pumping Station.

To supplement water transfers, LADWP also investigated the feasibility of water banking. A request for proposal (RFP) was issued in 2008 and five proposals were received for evaluation to identify the most mutually beneficial water banking program. However, after this evaluation process, LADWP decided to not pursue full scale water banking projects at this time.

The City supports statewide water transfer legislation that will ensure the efficient use of the State's limited water resources and provide safeguards for the environment, public facilities, water conservation efforts and local economies. LADWP will continue to develop a responsible water transfer program that can assist in replacing City supplies that have been reallocated, pursuant to legally binding obligations, to the environment in the Eastern Sierra Nevada.

Exhibit 9A
Neenach Pump Station

Neenach Temporary Pumping Station, construction site, looking northerly, taken May 4, 2015, by Aqueduct Aerial Patrol.

9.1.2 MWD Opportunities

MWD has historically utilized water banking, transfer, exchange, and storage programs to mitigate supply shortages in southern California during dry periods. Through these programs, MWD has been able to store water during wetter years for withdrawal during dry years, and make spot purchases of transfer water in drier years for direct delivery to MWD's service area. MWD has successfully stored, recovered, and delivered hundreds of thousands of acre-feet with these programs. Currently MWD has multiple supply opportunities under development and continues to seek out and implement agreements and cooperative arrangement opportunities to enhance their dry year supply portfolio.

MWD's 2015 IRP Update recognizes that a comprehensive transfer and exchange program can reduce the likelihood of shorter-term water imbalances until long term permanent solutions are developed. Water transfers and exchanges can be utilized in three ways:

- Water supply augmentation,
- Offsets to withdraws from storage, and
- Additions to storage reserves.

MWD has successfully developed and implemented transfer and storage projects in the Central Valley and along the Colorado River System. Between 2012 and 2015, MWD has used approximately 457 thousand acre feet of water from its SWP storage and transfer programs to supplement SWP supplies. MWD continues to pursue additional transfer and storage projects and further improve optimization of existing projects to supplement dry year supplies. In 2015, MWD sought to further improve existing storage projects in the Central Valley by providing storage partner agencies with up-front capital for infrastructure to improve water return capabilities. Water storage and transfers programs, including the programs highlighted below, are an important element of the California plan to live within its 4.4 million acre-feet per year entitlement to Colorado River water. These programs have also helped MWD adjust to regulatory restrictions on SWP pumping from the San Francisco Bay-Delta. Current and potential MWD transfer, storage, and exchange agreements/activities include, but are not limited to:

- Westside Mutual Water Company and Kern County Water Agency Exchanges
- Antelope Valley- East Kern Water Agency Exchange and Storage Program
- Semitropic Water Banking and Exchange Program
- Mojave Water Agency Demonstration Program
- Kern Delta Water District Water Management Program
- Arvin-Edison Water Management Program
- San Bernardino Valley Municipal Water District Transfer and Storage Program
- San Gabriel Valley Municipal Water District Program
- Central Valley/State Water Project Storage and Water Transfers
- California Drought Water Bank
- Multi-Year Water Pool Demonstration Program
- State Water Contractors Water Transfer Program
- Imperial Irrigation District/MWD Conservation Program
- Desert Valley Agency/Coachella Valley Water District/MWD Exchange and Advanced Delivery Program
- Palo Verde Land Management, Crop Rotation, and Water Supply Program

- Land Management of MWD Owned Land in Palo Verde Valley
- Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement
- Southern Nevada Water Authority Interstate Banking Agreement
- Yuba Accord Dry Year Purchase Program
- Lower Colorado Water Supply Project
- Lake Mead Intentionally Created Surplus Storage Program
- Binational Intentionally Created Surplus
- Southern Nevada Water Authority Interstate Banking Agreement
- Drop 2 Reservoir Funding
- Yuma Desalter Pilot Project
- Expansion of Palo Verde Irrigation District Land Management Program (under development)
- Arizona Storage and Interstate Release Program (under development)
- Bard Water District and California Indian Tribes Exchange (under development)
- Antelope Valley/East Kern Acquisition and Storage (under development)

During dry years MWD has purchased significant amounts of water on the spot water market or through option contracts to further augment existing banking and transfer programs. Spot market purchases make water available through contracts entered into the same year that the water is delivered. Option contracts are multi-year or single-year contracts that allow MWD to obtain water on an as-needed basis.

MWD's water rate structure is designed to allow water transfers using MWD infrastructure by establishing a water wheeling rate, which is a combination of the System Access Rate, Water Stewardship Rate, System Power Rate, and if treated water is delivered, a Treatment Surcharge. This wheeling rate applies to all water conveyed through MWD's infrastructure, regardless of the agency using the system. MWD's unbundled rate structure and its associated wheeling rate encourage development of water markets by providing for competition at the supply level; MWD's member agencies can purchase supplies from any source and pay MWD's wheeling rate to transmit the water. MWD's current water rate structure establishes charges for each component on a per acre-foot basis for all water moving through MWD's system. As of January 1, 2016, current wheeling rate charges are:

- System Access Rate: $259/AF
- Water Stewardship Rate: $41/AF
- System Power Rate: $138/AF
- Treatment Surcharge: $348/AF

The System Access Rate recovers costs associated with conveyance and distribution capacity to meet average annual demands. The Water Stewardship Rate recovers the cost associated with providing financial incentives for investments in local water resources, such as water conservation and recycled water programs. The System Power Rate recovers the cost of power required to move water through MWD's system. The Treatment Surcharge applies to all water that is treated at one of MWD's five treatment plants.

MWD's water rate structure also incorporates a tiered supply rate format. The first tier price applies to a fixed base quantity of water as defined by each MWD member agency's purchase order contract. The second tier price reflects the incremental cost for MWD to acquire additional supplies that are above the first tier contract base amount.

9.2 Brackish Groundwater Recovery

The City's groundwater is one of the most reliable and cost effective sources of our supply portfolio. Much of the groundwater sources will require remediation, but the City's overlying basins also present the opportunity for increased pumping. LADWP is investigating the potential for Brackish groundwater recovery: the process of pumping and treating water saltier than acceptable drinking water standards, but significantly less salty than seawater. The Total Dissolved Solids (TDS) content of brackish groundwater water typically ranges between the drinking limit of 1,000 mg/L and the TDS of seawater, which is in excess of 30,000 mg/L. The main advantage of treating brackish over seawater is achieved through the energy savings associated with pushing lower salt concentration water through reverse osmosis membranes, resulting in a more cost-beneficial supply. While consideration of brackish groundwater recovery is merely in the concept phase, LADWP hopes to use this additional pumping strategy to help maximize its groundwater basin pumping potential.

9.3 Seawater Desalination

Seawater desalination, the process of removing salts and other impurities from seawater, has reached an all-time high in terms of worldwide production capacity. According to the International Desalination Association, between 2009 and 2013, worldwide total seawater desalination capacity increased from 9.5 billion gallons per day to 21.1 billion gallons per day. This is partly driven by technology and process advancements that have led to significantly reduced costs. Of the more than 17,000 seawater and groundwater desalination plants in operation worldwide, the majority are located in the Middle East, where energy costs are relatively low. The world's largest seawater desalination plant in Saudi Arabia became operational in 2014 and produces 264 million gallons per day (mgd) of desalted water. In contrast, the largest facility in the United States is located in Carlsbad, California and produces 50 mgd. The Carlsbad Desalination Plant became operational in December 2015.

LADWP's current water resource strategy does not include seawater desalination as a water supply. There are concerns over the cost and environmental impacts associated with implementation of desalination. LADWP is primarily focused on enhancing local supplies including recycling and conservation. While desalination may be further explored in the future, it currently represents only a potential supply alternative.

9.3.1 Desalination Technology

Technology to desalt seawater and produce potable water that meets or exceeds drinking water standards has been available for some time. However, desalination has not been widely implemented, primarily due to its high cost. Continued research and development are driving costs down. Additionally, increasing costs associated with new and existing supplies are narrowing the cost differential between desalinated water and other water sources and increasing the viability of desalination.

The two basic seawater desalination processes are: 1) use of the distillation process to evaporate water from salts; and 2) use of semi-permeable membranes to filter the water through while straining out the salts. While distillation was historically the dominant seawater desalination technology (primarily in the Middle East), current worldwide desalination development is rapidly migrating toward membrane technology. Facilities using distillation are still prevalent in the Middle East. However, new plant installations are increasingly taking advantage of technological advancements (higher yield and lower energy requirements) in membrane-based process technology. As of 2013, approximately 60% of all installed desalination capacity in the world relies on membrane filtration.

9.3.2 DWR Desalination Efforts

Recognizing the potential of seawater as a water resource, the DWR through a legislative mandate, convened a California Water Desalination Task Force in 2002. The task force was responsible for making recommendations to the State Legislature on potential opportunities, impediments, and the State's role in furthering desalination technology.

The task force was effective in providing a forum in which stakeholders could convene and discuss critical issues related to desalination. Key seawater desalination issues that have been raised through the task force fall into six general categories: environmental, economic, permitting, engineering, planning, and coordination.

To assist in addressing these issues, the California Water Desalination Task Force has developed draft guidelines for developing environmentally and economically acceptable desalination projects. These include the following:

- Each project should be considered on its own merits.
- Sponsoring agencies should be determined early in the planning process.
- Public and permitting agencies should be engaged early in the planning process.
- Collaborative processes should be used to enhance support for project implementation.
- A feedback loop should be incorporated to allow for continuously revisiting and revising the project at each step of the planning process.
- Key decision points (e.g., costs, environmental acceptability) should be identified to test the general feasibility of the project as early in the planning process as possible.

After establishment of the task force, desalination was added to the California State Water Plan as an alternative for consideration in regional water supplies. Furthermore, in 2008, DWR published the California Desalination Planning Handbook, building upon the task force's efforts. The handbook provides guidance on determining appropriate conditions for desalination plants, addressing concerns, and building public trust.

DWR offers funding for desalination through its Water Desalination Grant Program. Proposition 50, Chapter 6, has provided over $55 million in grant funding through three rounds of funding for desalination research, feasibility studies, pilot projects, and construction of new facilities. DWR will offer a fourth round of funding in 2016 for $49.6 million using a combination of funds from Proposition 50 and Proposition 1 and a fifth round in 2018/19 for $43.5 million using solely Proposition 1 funding. Over $45 million was distributed under this proposition in two rounds of funding for both seawater and groundwater desalination.

With increasing demand for water and limited new supply options, the future value of seawater desalination as a part of California's water supply portfolio has become apparent. Within southern California, a range of 251,000 AFY to 502,000 AFY of desalinated seawater could be potentially produced based on current efforts (see Exhibit 9A). While this production represents less than five percent of the region's total water supplies, it is nonetheless considered by water planners as an important part of the region's water supply portfolio.

9.3.3 MWD Desalination Efforts

MWD first incorporated desalinated seawater as a potential new water supply source in its 2003 Integrated Resources Plan Update. Subsequently in 2009, MWD's Board of Directors created a special committee on Desalination and Recycling to study MWD's role in regional efforts to develop desalination facilities. In October 2014, MWD revised its Local Resources Program (LRP) to include desalination as an eligible supply. MWD provides financial incentives to member agencies through its LRP to financially assist in development of eligible local resources. Additionally, to support seawater desalination MWD provides technical assistance and regional facilitation of research and information exchanges to its member agencies.

In response to a Seawater Desalination Program proposal solicitation in 2001, MWD received proposals from five member agencies to provide up to 142,000 AFY of potable water. To provide an incentive for the development of desalinated seawater, MWD is offering subsidies for each acre-foot (326,000 gallons) of desalinated seawater produced. The LRP incentive structure offers three options: sliding scale incentives up to $340/AF over 25 years, sliding scale incentives up to $475/AF over 15 years, or fixed incentives up to $305/AF over 25 years. LADWP, Long Beach Water Department (LBWD), West Basin Municipal Water District (WBMWD), Municipal Water District of Orange County, and San Diego County Water Authority (SDCWA) submitted detailed proposals that qualified for the MWD's Seawater Desalination Program. MWD currently has three agreements under the program. LADWP's project is no longer part of the program, and SDCWA's project proceeded without Seawater Desalination Program incentives. SDCWA's facility moved forward to completion and operation in late 2015, Poseidon Water's Claude "Bud" Lewis Carlsbad Desalination Plant. Through a 30-year agreement Poseidon Water will provide SDCWA 56,000 AFY. MWD has included this source as a local supply in its 2015 UWMP projections as providing 51,000 AFY during average hydrologic conditions and 56,000 AFY in dry years. Exhibit 9B summarizes the status of the desalination efforts in MWD's service area, including projects not in the Seawater Desalination Program. All of these agencies serves coastal areas, and is looking to desalination as a means to further diversify its water supply portfolio.

Exhibit 9B
Desalination Efforts in MWD Service Area

Project Name	Member Agency	Capacity (AFY)	Status
MWD Seawater Desalination Program			
Long Beach Seawater Desalination	Long Beach Water Department	10,000	Long-Term Intake Testing
Doheny Desalination Project	Municipal Water District of Orange County/South Coast Water District	5,000 - 16,000	Pre-EIR Studies
Claude "Bud" Lewis Carlsbad Desalination Plant	SDCWA	56,000	Online
West Basin Seawater Desalination	WBMWD	20,000 – 60,000	Pre-EIR Studies
	Subtotal	91,000 - 142,000	
Other Potential Projects in MWD Service Area			
Huntington Beach Seawater Desalination	Municipal Water District of Orange County/Orange County Water District	56,000	Permitting
Camp Pendleton Seawater Desalination	SDCWA	56,000 - 168,000	Planning
Ventura County	Calleguas Municipal Water District	20,000 - 80,000	Feasibility Study
Rosarito Beach Seawater Desalination	SDCWA/Otay Water District	56,000 – 112,000[1]	Feasibility Study
	Subtotal	160,000 - 360,000	
	Total	251,000 - 502,000	

[1] MWD's service area would receive a share of the total water produced.

Source: MWD 2015 Urban Water Management Plan, Tables 3-10 to 3-11.

9.3.4 LADWP Seawater Desalination Efforts

Scattergood Generating Station Seawater Desalination Plant

LADWP initiated efforts in 2002 to evaluate seawater desalination as a potential water supply source with the goals of improving reliability and increasing diversity in its water supply portfolio. These efforts led to the selection of Scattergood Generating Station as a potential site for a seawater desalination plant. For the City, seawater desalination is a potential resource that could also offset supplies that had been committed from the LAA for environmental restoration in the eastern Sierra Nevada. As an identified project in MWD's Seawater Desalination Program, the proposed full-scale project would have qualified for MWD's LRP incentive of up to $475/AF. However, in May 2008, LADWP decided to focus on water resources development, including conservation and water recycling, as part of its primary strategy to create a sustainable water supply for the City.

While seawater desalination is not a potential water supply strategy for the LADWP at this time, studies performed to date have provided beneficial data that can assist LADWP in future evaluations of seawater desalination. Completed studies include:

- the LADWP Proposed Seawater Desalination Plant Site Selection Fatal Flaw Analysis (2002),
- LADWP Seawater Desalination Facility Feasibility Study for the Scattergood Generating Station in Playa Del Rey (2004),
- Brine Dilution Study for the LADWP Desalination Project at Scattergood Generating Station (2005), and
- Scattergood Seawater Desalination Pilot Project Preliminary Evaluation Report (2008).

To determine the proper site location for a City desalination plant, LADWP conducted the LADWP Proposed Seawater Desalination Plant Site Selection Fatal Flaw Analysis evaluating three City-owned coastal power generating plants. Based on the findings from this analysis, LADWP initially decided to investigate development of a 12 to 25 mgd desalination facility at the Scattergood Generating Station.

Optimum capacity of a future desalting facility at the Scattergood Generating Station was evaluated in the LADWP Seawater Desalination Facility Feasibility Study. Results of the study indicated a 25 mgd facility would be the most economical. Estimated capital costs for a 25 mgd facility were approximately $148.5 million in 2004 dollars with an annual operations and maintenance cost of $28.9 million (2004 dollars) resulting in a total water cost of approximately $1,257 per AF (2004 dollars). The study also identified the five-mile Hyperion Treatment Plant Outfall, which is adjacent to the Scattergood Generating Station, as the most environmentally advantageous method to dispose of the brine concentrate produced from the desalting process.

In an effort to develop an environmentally compatible project, LADWP evaluated the feasibility of discharging the desalted concentrate into Hyperion Wastewater Treatment Plant's 5-mile outfall. The Brine Dilution Study for the LADWP Desalination Project at Scattergood Generating Station performed by the Scripps Institute of Oceanography found that there are potential environmental benefits to the Santa Monica Bay's marine biology due to improved salt balance if the effluent discharged by the Hyperion Wastewater Treatment Plant were to include brine from a desalination facility.

In March 2008 the Preliminary Evaluation Report of the Scattergood Generation Station Seawater Desalination Pilot Project was completed. This was the first task of multiple tasks that was to ultimately result in the operation of a pilot plant. Co-funded by the US Bureau of Reclamation and DWR through Proposition 50 funding the overall goal was to further investigate the viability of seawater desalination for LADWP. Recommendations on site specific technologies and processes were provided for carry over to the pilot plant design stage. Items for further study included subsurface intake evaluation, cooling alternatives for warm water, second pass reverse osmosis, post treatment stabilization, and finished water blending strategy.

After completion of the first task, the subsequent tasks were not initiated. Instead, the City established a new sustainable water supply strategy that focused on local resources including conservation and recycled water. Studies completed to date and LADWPs other seawater desalination efforts discussed below have provided important data that could assist LADWP if the decision is made to move forward with seawater desalination in the future.

Other LADWP Seawater Desalination Efforts

LADWP historically engaged in multiple partnerships to advance seawater desalination in southern California. Seawater desalination is hindered by multiple challenges including, but not limited to, capital costs, operating costs, environmental considerations, water quality, and public acceptance. To overcome these challenges, LADWP has supported efforts to lower the capital and operating costs of producing desalinated ocean water. LADWP also participated with California stakeholders through multiple venues, such as the MWD and the California Water Desalination Task Force to develop desalination study projects within Southern California.

LADWP, the Long Beach Water Department (LBWD), and the United States Bureau of Reclamation partnered in the construction of a 300,000 gpd prototype seawater desalination facility to complete testing of LBWD's proprietary two-stage nanofiltration process (using membranes that require lower operating pressures and thus, the potential for lower operating costs). LBWD successfully performed a 9,000-gpd bench-scale testing of this technology and began testing on a larger scale in October 2006 at LADWP's Haynes Generating Station in Long Beach. In March 2010, LBWD completed its testing and subsequently prepared the final report.

LADWP also partnered with the WBMWD and other agencies in the American Water Works Association Research Foundation Tailored Collaboration project titled Water Quality Implications for Large-Scale Applications of MF/RO Treatment for Seawater Desalination. A 30,000-gpd pilot facility operating off the coast of El Segundo, California, from 2002 to 2008, was tested for membrane performance, water quality, and operational cost.

In a joint study by LADWP, LBWD, and WBMWD, preliminary sampling of raw seawater quality was initiated at three potential seawater desalination sites - Scattergood Generating Station in Playa Del Rey, Haynes Generating Station in Long Beach, and El Segundo Power Generating Station. Water quality analysis on the seawater was performed at various times of the year to analyze seawater quality variations during storm events when city surface runoffs drain into the ocean. The next step would be to collaborate with the California Department of Health Services on developing guidelines to ensure that product water from future desalting facilities will meet all State and Federal water quality regulations.

9.4 Other Water Supplies Yield and Cost

The range of water supplies, the unit cost, risks, and other benefits besides reductions in water demands for water transfers are presented in Exhibit 9C. LADWP recognizes the value of this water supply in offsetting unanticipated changes to supply or demand. Strategic water planning necessarily includes continuous monitoring of existing and future alternative water resources.

Exhibit 9C
Other Water Supplies

Water Supply Alternatives	Potential Water Yield (AFY)	Average Unit Cost ($/AF)	Implementation Risks	Additional Benefits
Water Transfer	40,000	$220-$700[1]	Wheeling and other institutional issues must be addressed.	Replaces water committed to the environment, pursuant to legally binding obligations
Seawater Desalination	N/A	$1,500-$3,000[2]	Environmental permitting may be difficult.	Replaces water committed to the environment. Hedges against climate change.

For Comparison Purposes:
Local Groundwater Unit Cost = $ 341 /AF
MWD Treated Tier 2 Water Supply Unit Cost (1/1/16) = $942/AF

Notes:

1. Cost does not include wheeling fees. Treatment costs not included.

2. Source: Metropolitan Water District of Southern California Integrated Water Resources Plan 2015 Update 3.

Chapter Ten

Integrated Resources Planning

Japanese Garden at Donald C. Tillman

10.0 Overview

Integrated resources planning is a process used by many water, stormwater (flood control), and wastewater agencies to meet their future goals in the most effective way possible, and with the greatest public support. The integrated resources planning process in general incorporates:

- Public stakeholders in an open, participatory process;
- Multiple objectives such as reliability, cost, water quality, environmental stewardship, and quality of life;
- Risk and uncertainty;
- Partnerships with other agencies, institutions, and non-governmental organizations.

LADWP has been involved in integrated resources planning since the development of its first UWMP in 1985 which incorporated conservation, recycled water, stormwater capture, and supplies from the Metropolitan Water District of Southern California (MWD). LADWP also participated when MWD initiated the Southern California region's first Integrated Resource Plan (IRP) in 1993. LADWP was an active member of the technical workgroup that oversaw the development of alternatives and recommendations from MWD's IRP. In 1999, the City embarked on its first IRP for wastewater, stormwater and water supply. LADWP was a partner in this effort, working with the City's Bureau of Sanitation (LASAN). LADWP has continued as a partner in integrated resources planning through its ongoing efforts associated with the update of the City's IRP, known as One Water LA 2040 (One Water LA). In 2006, the first Greater Los Angeles County Integrated Regional Water Management Plan (IRWMP) was published. It was subsequently updated in 2013 and approved in 2014. In addition, LADWP is a member of the Integrated Regional Water Management (IRWM) Leadership Committee and, along with the Council for Watershed Health, serves as co-chair of the of the Upper Los Angeles River Watersheds sub-region for the IRWM region.

10.1 City of Los Angeles Integrated Water Resources Plan and One Water LA 2040 Plan

10.1.1 Description and Purpose

The City's IRP is a unique approach of technical integration and community involvement to guide policy decisions and

Echo Park Lake

water resources facilities planning. The IRP recognizes the inter-relationship of water, wastewater, and runoff management. Initiation of the IRP began in 1999 and culminated in its unanimous adoption by the City Council in 2006. Through the stakeholder driven IRP process, detailed facility plans were developed for the City's wastewater and stormwater systems through the 2020 planning horizon. Utilization of an integrated watershed approach identified opportunities that would not have been traditionally identified if water, wastewater, and stormwater were continued to be viewed independently. In the past, the City utilized single-purpose planning efforts for each agency, such as one plan for wastewater and a separate plan for water supply. The IRP included capital improvement programs for wastewater and stormwater, a recycled water master plan, and a programmatic Environmental Impact Report. With the IRP, the City was able to develop a vision for meeting 2020 needs in a more cost-effective and sustainable way by addressing and integrating all its water resources. A further outcome of the IRP process was the identification of partnerships between City departments, other agencies, and non-governmental organizations. For its efforts, the City won multiple awards for excellence, including the 2011 U.S. Water Prize from the U.S. Water Alliance, and the 2007 Grand Prize from the Academy of Environmental Engineers and Scientists. Completion of the IRP led to multiple successful programs in the City, including:

- Deferment of large wastewater capital projects totaling over $500 million due to reductions in water demands, related to the "go-if triggered" management approach adopted in the IRP;

- Increases in water conservation programs, such as high-efficiency clothes washer rebates, high-efficiency toilet rebates, and rebates for turf replacement with California friendly landscaping;

- Creation of the Recycled Water Advisory Group and completion of detailed Recycled Water Master Planning documents with the goal of reducing dependence on imported water by 59,000 AFY;

- Planning of a Groundwater Replenishment Project for the San Fernando Basin utilizing purified water from the Donald C. Tillman Water Reclamation Plant to recharge up to 30,000 AFY into the basin; and

- Passage of the City's Proposition O to fund multi-purpose water quality and stormwater management projects through a $500 million bond, resulting in projects such as Echo Lake Restoration, Machado Lake Restoration, South LA Wetlands, LA Zoo porous pavement, green street initiatives, and various other projects throughout the City.

To build on the success of the IRP, the City has initiated the development of the One Water LA 2040 Plan. One Water LA extends the IRP planning period to year 2040 and takes into consideration an additional emphasis on environmental, social, and sustainability factors. The overarching goal of One Water LA is to maximize resources through the integration of multi-beneficial collaborative programs and projects to make the City greener and more sustainable. One Water LA will follow in the footsteps of the IRP and will be a stakeholder driven process with a goal of increased public involvement to represent LA's diversity in geography, interests, and demographics. One Water LA will not supersede the 2015 UWMP, as the purpose of One Water LA is to identify collaboration opportunities as a result of integrated efforts between agencies.

10.1.2 One Water LA Approach

One Water LA will be developed in a two-phase process. Phase 1, completed in 2015, consisted of two components: 1) development of a vision, objectives, and guiding principles and 2) development of an initial water balance tool to serve as a starting point for detailed analysis scheduled to occur in Phase 2. Phase 1 included three stakeholder workshops to develop initial planning baselines as well as guiding principles to coordinate water management and citywide facilities planning. Since completion of the IRP, various new reports and studies provided updated projections. Updated projections contained in LADWP's 2015 UWMP will serve as a baseline for One Water LA which will evaluate additional collaborative integration opportunities to further address water related challenges, such as:

- Adoption of the 2012 Municipal Separate Storm Sewer System (MS4) permit for Los Angeles County by the Los Angeles Regional Water Quality Control Board (LARWQCB) allowing municipalities to develop a more integrated approach through the use of Enhanced Watershed Management Plans to meet Total Maximum Daily Loads (TMDLs) associated with stormwater discharges.

- Impacts of climate change, which may reduce snowpack levels and result in earlier snow melt impacting long-term availability of imported water to Los Angeles; and increase stress on local ecosystems, increase the risk of localized flooding, cause sea level rise, which may impact critical coastal water infrastructure,

- Decreased wastewater flows and water demands from increased water conservation;

- Citywide impacts of long-term and severe droughts; and

- Stormwater and wastewater infrastructure and facilities improvements to meet future citywide needs.

Phase 2 will refine baseline projections developed during Phase 1 through the completion of technical studies and continued stakeholder engagement to develop and compare projects, policies, and additional opportunities. Final documents from Phase 2 will include the updated facility plans for stormwater and wastewater, and recommended policies and procedures for increasing coordination and integration of the City's water related goals, beyond the goals established in this UWMP. Additionally, Phase 2 will provide guidance for completion of future integration master plans in the City. Phase 2 is estimated to be completed in December 2016 with a Programmatic Environmental Impact Report scheduled for completion in December 2017.

10.1.3 Stakeholder Participation

At the beginning of Phase 1, a goal was established to increase stakeholder engagement and widen the stakeholder audience. Phase 1 had five levels of stakeholder involvement as illustrated in Exhibit 10A. At the core of the outreach program, the Steering Committee, Inter-Department/Agency Coordination, and Stakeholder Advisory Group helped identify the topics for discussions and solicitation of feedback at the public stakeholder workshops. In turn, the public stakeholder workshops assisted in conveying the information to the public at large. Additionally, LADWP and LASAN conducted over two dozen outreach meetings and conferences with the public. A culmination of the outreach process was the creation of the vision, objectives, and Guiding Principles.

Exhibit 10A
One Water LA Phase 1 Stakeholder Involvement

10.1.4 Vision, Objectives, and Guiding Principles of One Water LA

A vision statement, objectives, and guiding principles were developed through the outreach process to guide development of Phase 2. The vision statement serves to define the purpose of One Water LA:

One Water LA is a collaborative approach to develop an integrated framework for managing the City's water resources, watersheds, and water facilities in an environmentally, economically and socially beneficial manner.

One Water LA will lead to smarter land use practices, healthier watersheds, greater reliability of our water and wastewater systems, increased efficiency and operation of our utilities, enhanced livable communities, resilience against climate change, and protection of public health.

Objectives were developed to describe the major goals of the plan in a clear and easily understood manner. Objectives also can serve as the basis for development of evaluation criteria to compare potential choices and actions. Objectives developed for One Water LA are:

1. Integrate management of water resources and policies by increasing coordination and cooperation between City departments, partners, and stakeholders.

2. Balance environmental, economic, and societal goals by implementing affordable and equitable projects and programs that provide multiple benefits to all communities.

3. Improve health of local watersheds by reducing impervious cover, restoring ecosystems, decreasing pollutants in our waterways, and mitigating local flood impacts.

4. Improve local water supply reliability by increasing capture of stormwater, conserving potable water, and expanding water reuse.

5. Implement, monitor, and maintain a reliable wastewater system that safely conveys, treats, and reuses wastewater, while also reducing sewer overflows and odors.

6. Increase climate resilience by planning for climate change mitigation and adaption strategies in all City actions.

7. Increase community awareness and advocacy for sustainable water by active engagement, public outreach and education.

A total of 38 guiding principles were developed to guide development of detailed planning and policies during Phase 2 of One Water LA. Principles were developed for each objective, however the principles are not intended to define specific targets or mechanisms for project implementation. Development of the guiding principles was a long process to ensure multiple rounds of internal discussions and stakeholder engagement occurred. Ultimately, the guiding principles reflect multiple viewpoints and are balanced among various interests.

10.1.5 City's IRP and One Water LA Implications for City's Urban Water Management Plan

One of the primary purposes for developing the IRP was to explicitly consider the relationship between wastewater facility planning and other water resources issues, such as water supply and urban runoff. Implementation of the IRP has and will continue to result in increased beneficial reuse of water, water conservation, and groundwater supplies. IRP alternatives examined ways to decrease potable water needs by expanding the City's recycled water program; increase water efficiency by installing smart irrigation and other water efficient devices that reduce irrigation and indoor water demands; and increase groundwater resources by using wet weather runoff to recharge the aquifer. The IRP demonstrated that by integrating water resources planning for the City, more opportunities for water supply development can be identified. These past IRP efforts have helped to guide the long term goals of the UWMP.

One Water LA further builds upon the efforts of the IRP by extending the water resources planning horizon to year 2040. Through the One Water LA process, new policies and capital improvement projects will be identified to meet the aforementioned objectives established in Phase 1. These projects will improve the sustainability of LA's water supply while addressing unknowns, such as climate change, in coordination with achieving local water supply targets and goals established in ED No. 5 and the City Sustainability Plan (pLAn).

10.2 Greater Los Angeles County Integrated Regional Water Management Plan (IRWMP)

10.2.1 Description and Purpose

The first Greater Los Angeles County (GLAC) Integrated Regional Water Management Plan (IRMWP) was completed in 2006 after a multi-year effort led by the Los Angeles County Department of Public Works. Water quality, resource, and supply issues within the region are complex and managed by a myriad of government agencies subjected to a plethora of regulations. Exponential growth over the last century has required water managers to develop creative solutions to meet growing demands. Previously, projects addressing water issues were designed to appease single-focused visions and solutions of organizations operating independently. At the core of the plan, a clear vision and direction for the sustainable management of water resources within the region for the next twenty years was formulated. In 2013, an updated IRWMP was completed. This was followed by approval of the updated plan by the IRWM Leadership Committee on August 27, 2014. The updated plan was done to comply with new requirements, improve content, and maintain eligibility for funding opportunities. The updated plan allowed stakeholders to revisit goals and objectives established in the original plan to reflect updated conditions thru 2035.

Since the first IRWMP, 1,600 projects were collected and synthesized for inclusion in the plan. This required hundreds of local government agencies to cooperatively develop cost-effective, sensible, and economically feasible solutions to address regional water issues in an integrated manner. As of January 2016, the cutoff data for inclusion in the 2013 Plan Update, 215 projects were on the approved project list. Projects are reviewed and added to the list on an ongoing quarterly basis.

Throughout the IRWM process, new partnerships continued to be forged between potential funding partners from within and outside the region. The IRWM process led to the formation of the GLAC, an innovative partnership between agencies creating a new model of integrated regional planning to address competing water demands, water supply reliability, and project financing. Since inception of the GLAC IRWM region in 2006, 40 projects in the region have been awarded over a combined $74 million in IRWM implementation grant funding through Propositions 50 and 84.

Region

The IRWM region encompasses 84 cities, portions of four counties, and hundreds of government agencies and districts spread over 2,058 square miles. Approximately 9.6 million residents, or equivalent to roughly 26 percent of the population of California, reside within the region. To facilitate input, variations in geographic and water management strategies, and effective planning, the region was further subdivided into five sub-regions:

- Upper Los Angeles River Watersheds
- Lower San Gabriel and Los Angeles River Watersheds
- North Santa Monica Bay Watersheds
- South Bay Watersheds
- Upper San Gabriel River and Rio Hondo Watersheds

The City of Los Angeles is within the Upper Los Angeles River Watershed sub-region.

Mission and Purpose

As part of the IRWM Update a collaborative process resulted in the formation of a revised mission statement:

To address the water resources needs of the Region in an integrated and collaborative manner to improve water supplies, enhance water supply reliability, improve surface water quality, preserve flood protection, conserve habitat, and expand recreational access in the Region.

The 2013 Plan Update recognizes that in order to meet future needs, water supply planning must be integrated with other resource strategies. Additionally, in a region with significant urban challenges, including population growth, densification, traffic congestion, poor air quality, and quality of life issues, it is imperative to consider water resources management in conjunction with other urban planning issues. Ultimately, the purpose of

Headworks Aerial

the 2013 Plan Update is to develop a comprehensive vision for sustainable management of water resources allowing the Region to procure local funding, position the Region to be eligible for State bonds, and develop opportunities to obtain federal funding.

10.2.2 Stakeholder Involvement

Stakeholders include water retailers, wastewater agencies, watershed groups, stormwater and flood managers, disadvantaged communities, business community members, public community members, Native American tribes, agriculture, and non-profits. To facilitate management of the GLAC Region and stakeholders, the region is organized into the aforementioned five watershed subregions. Stakeholders participated in workshops, project identification, and development of the 2013 Plan Update. Stakeholders were involved in the development of the 2013 Plan Update through participation in the Leadership Committee, Leadership Committee Subcommittees, Steering Committees for subwatershed regions, and regional and subregional workshops. As a water retailer in the Los Angeles Basin, LADWP is a member of the IRWM Leadership Committee and with the Council for Watershed Health, co-chairs the Upper Los Angeles River Watersheds subregion. The stakeholder process allows all participants to coordinate and share their plans facilitating mutual development of projects.

10.2.3 Recommended Projects

The 2013 Plan Update included 135 approved projects. In the interim period after completion of the original IRWMP, the GLAC region further defined and improved the process for including projects on the approved list of projects. Submission of projects is an open process where projects can be submitted at any time, however, the GLAC region only reviews projects for potential inclusion on the approved list on a quarterly basis. Periodic calls are made for projects in response to deadlines, such as upcoming grant funding application submittal dates, therefore, the number of recommended projects will fluctuate based on a given point in time. Projects are reviewed using a two stage process at the Subregional Steering Committee level:

- Stage I – Projects are evaluated to determine if the project meets the basic minimum criteria of addressing IRWM objectives and targets.
- Stage II – Projects are evaluated to determine if key elements of the project are complete enough for the Subregional Steering Committee to

determine if the project will meet DWR requirements and GLAC region objectives and targets.

In the 2013 Plan Update, the Leadership Committee does not prioritize projects on the approved list as projects are constantly evolving. Prioritization may lead to prioritizing certain objectives above others, and the region wants to maintain the flexibility to prioritize projects on an as needed basis in response to current issues, such as the ongoing drought, and specific grant solicitation requirements.

Objectives and Targets

Projects must meet objectives and targets adopted by the GLAC region in order for a project to be added to the approved list of projects. During the 2013 Plan Update process, the five previous objectives developed for the IRWMP were refined and updated to reflect stakeholder input and needs of the overall GLAC region. Objectives were developed through a summation of subregional targets involving a two-step process consisting of technical input and stakeholder input. Targets were developed through a combination of three Water Management Subcommittees; Water Supply, Water Quality & Flood Management, & Habitat and Open Space. Stakeholders provided input to Subregional Steering Committees by providing comments on the methods and formats used to develop the targets. Stakeholders also provided documents and data to assist in developing the objectives and targets. Additionally, stakeholders provided multiple data sources, including water resource management plans, habitat and open space inventories, City general plans, water quality impairment listings, and FEMA flood management and County Sediment Management Plans.

Objectives and targets identified in the 2013 Plan Update for Year 2035 are:

- **Improve water supply** - optimize local water resources to reduce the region's reliance on imported water with targets of conserving 117,000 AFY; creating the ability to pump an additional 106,000 AFY of groundwater; increase indirect potable reuse of recycled water by 80,000 AFY; increase non-potable reuse of recycled water by 83,000 AFY; increase capture and direct use of stormwater runoff by 26,000 AFY; increase stormwater infiltration by 75,000 AFY; and develop seawater desalination of 26,000 AFY;

- **Improve surface water quality** - comply with water quality regulations, inclusive of TMDLs, by improving the quality of urban runoff, stormwater, and wastewater with targets of 54,000 AF of stormwater capture capacity spatially dispersed;

- **Enhance habitat** - protect, restore, and enhance natural processes and habitats with targets of preserving or protecting 2,000 acres of terrestrial habitat, enhancing 6,000 acres of terrestrial aquatic habitat, and restoring or creating 4,000 acres of terrestrial aquatic habitat;

- **Enhance open space and recreation** - increase watershed friendly recreational space for all communities with targets of creating 38,000 acres of open space and 25,000 acres of urban parks;

- **Reduce flood risk** - reduce flood risk in flood prone areas by either increasing protection or decreasing needs using integrated flood management practices with targets of reducing flood risks in 11,400 acres of flood prone areas, remove 68 million cubic yards of sediment from debris basins and reservoirs; and

- **Address climate change** – adapt to and mitigate against climate change vulnerabilities by increasing local supplies by an additional 7-10% beyond water supply targets by 2050, and implement "no regrets" adaptation and mitigation strategies that decrease emissions of greenhouse gases.

Projects

In the 2013 Plan Update, 135 projects were on the approved list for the GLAC region, with LADWP serving as the implementing organization for 14 projects. Projects can be added and removed through an online database that tracks the GLAC region. As a regional plan encompassing an area larger than LADWP's service area, many of the IRWM projects do not directly benefit LADWP's service area, but rather provide benefits towards improving water resources in the region as a whole. However, LADWP can utilize the results of these projects and apply the knowledge to potentially develop similar programs within the service area. LADWP serves as the implementation agency for the following projects as classified by primary benefits as determined in the 2013 Plan Update:

Water Quality

- Bull Creek Los Angeles Reservoir Water Quality Improvement Project

Water Supply

- Boulevard Pit Stormwater Capture Project
- Elysian Park Water Recycling Project
- Groundwater Treatment Facilities
- Hansen Dam Golf Course Recycling Project
- Los Angeles State Historic Park Water Recycling Project
- Mission Wells Improvement
- Sheldon Pit
- Valley Generating Station Stormwater Recharge Project
- Whitnall HWY Powerline Easement Stormwater Capture Project

Habitat/Open Space

- Elysian Reservoir Water Quality Improvement Project
- Headworks East Reservoir
- Headworks Ecosystem Restoration
- Silver Lake Reservoir Bypass and Regulator Station

LADWP received funding for three projects in the amount of $9 million as part of the Proposition 84, 2014 IRWM Drought Solicitation, funding round. Brief descriptions of these three projects are as follows:

Manhattan Wells Improvement Project

The Manhattan Wells Improvement Project is split to two phases. Phase I of the Project will install up to 2 off-site groundwater monitoring wells to characterize the vertical extent of contamination. Phase II will install up to 8 production wells, well collector lines, and related infrastructure in the existing wellfield. With these improvements, more than 10,000 AFY of production capacity will be restored.

Mission Wells Improvement Project

The Mission Wells Improvement Project will restore overall capacity to produce groundwater and utilize annual water rights and stored water credits. Stage 1 of the Project includes installation of up to five monitoring wells and three production wells at LADWP's Mission Wellfield in the Sylmar Basin. Stage 2 includes a hypochlorite generating station, to be constructed later, to comply with Stage 2 Disinfection Byproduct Rule. With these improvements, 3,570 AFY of production capacity will be restored.

Terminal Island Water Reclamation Plant Advanced Purification Facility and Distribution System Expansion

The Terminal Island WRP Advanced Water Purification Facility (TIWRP) and Distribution System Expansion Project is split to two phases, and is expected to be completed by October 2017. In Phase I, TIWRP will expand the production of highly purified recycled water by expanding the capacity of the current MF/RO treatment train and adding an advanced oxidation process (AOP) to produce high quality water. In Phase II, approximately 9,000 linear feet of pipeline will be constructed to reach all planned and potential recipients of product water from TIWRP. The Project is expected to offset up to 12,880 AFY of potable water demand.

Terminal Island Water Reclamation Plant

10.2.4 Implications of IRWM Planning for City's Urban Water Management Plan

LADWP is a member of the IRWM Leadership Committee and additionally serves as co-chair with the Council for Watershed Health for the Upper Los Angeles River Watersheds sub-region of the GLAC region. As member of the Leadership Committee, LADWP is a signatory to the Memorandum of Understanding for the IRWM approved by the Board of Water and Power Commissioners on July 15, 2008.

Participating agencies in the IRWM Leadership Committee coordinate and share information concerning water resources management planning programs, projects, and grant funding. Participation improves and maintains overall communication among the participants. Coordination and information sharing assists LADWP and other agencies in achieving their respective missions and contributes to overall IRWM goals.

Funding received through the IRWM process assists LADWP and the City in meeting local water supply reliability and sustainability goals defined in ED No. 5 and the Sustainability City pLAn in addition to assisting the overall GLAC region in meeting its targets and objectives. In addition to the $9 million for the three aforementioned projects through the 2014 Drought Solicitation Process under Proposition 84, LADWP received $5.5 million for Tujunga Spreading Grounds Enhancement and Griffith Park South-Central. To date LADWP has received $14.5 million for five projects through the IRWM process.

10.3 MWD's 2015 Integrated Water Resources Plan

MWD is developing its 2015 Integrated Water Resources Plan (IRP) Update using a two-phase process. Phase 1, the 2015 IRP Update, consisted of updates to data and projections that were included in the 2010 Plan and established targets for water supply reliability. This encompassed:

- Updating demographics, economic conditions, and water demands;
- Climate change and hydrologic scenarios;
- Water supplies from existing and new projects; and

- Future resource and conservation targets for regional reliability

Phase 1 was approved by the MWD Board on January 12, 2016. Phase 2 will consider implementation policies to reach the resource targets established in Phase 1. Together both phases will serve as MWD's strategic plan for water reliability through the year 2040. Phase 1 was developed through a collaborative process which incorporated input from water districts, local governments, stakeholder groups and the public. The earliest version of the IRP, which dates back to 1996, sets a regional reliability goal of meeting "full-service demands at the retail level under all foreseeable hydrologic conditions." The 2015 IRP Update maintains this reliability goal by seeking to stabilize MWD's traditional imported water supplies and establish water reserves to withstand California's inevitable dry cycles and growth in water demand. Phase 1 recognizes that remaining policy discussions regarding the development and maintenance of local supplies and conservation need to occur in Phase 2. The 2015 IRP Update resulted in development of six main findings and conclusions as described in MWD's 2015 UWMP, and summarized here:

- **Action is Needed** – MWD's service area would experience an unacceptable level of shortage allocation frequency in the future without investments in conservation, local supplies, and the California WaterFix identified in the 2015 IRP Update.

- **Maintain Colorado River Supplies** – MWD plans to stabilize minimum deliveries of 900,000 AF in a typical year through programs and partnerships to meet average-year projections and maintain a full aqueduct during dry years.

- **Stabilize SWP Supplies** – Beginning in the 1990's, environmental conditions along the SWP and in the Delta have decreased supply availability and reliability. Additionally, the existing system remains vulnerable to earthquakes and floods. A collaborative approach, involving state and federal agencies, to pursue better science for resolving issues about SWP operations and advancing the coequal goals of Delta restoration and statewide water supply reliability is needed in the near and long term.

- **Develop and Protect Local Supplies and Water Conservation** – The 2015 IRP Update supports and advances regional self-sufficiency ethics by increasing targets for additional local supplies and conservation. Development of new local supplies, protection of existing supplies, and improving water conservation are major components to maintaining the region's future reliability.

- **Maximize the Effectiveness of Storage and Transfers** – A comprehensive water transfer approach that utilizes water when it is available will assist in stabilizing and building storage reserves and increase the ability of MWD to meet water demands in dry years. In the near term, water transfers can also be utilized to supplement core supplies while long term projects are under construction. MWD acknowledges that ongoing problems in the Delta can limit its ability to transfer water obtained upstream of the Delta to areas south of the Delta.

- **Continue with the Adaptive Management Approach** – MWD's adaptive management strategy, first developed in the 2010 IRP Update, assists MWD in preparing the region for long-term changes to demographic, climate, water quality, economic, and regulatory conditions. MWD will continue to manage future risk and uncertainty through the 2015 IRP Update's adaptive management strategy. The strategy focuses on stabilizing and maintaining imported supplies, using increased conservation, and developing new local supplies to meet expected growth. The strategy also focuses on developing a transfers and exchange strategy, accumulating storage in wet and normal years to mitigate against droughts and risks associated with future uncertainty. Future supply actions, which are low cost and low risk designed to accelerate developments on an as needed basis, are a key component of the adaptive management approach to buffer against uncertainties. Future supply actions include recycled water, seawater desalination, stormwater capture, and groundwater cleanup.

10.3.1 Technical Update Issue Recommendations

As part of MWD's 2015 IRP Update process, the 2015 IRP Technical Update Issue Paper Addendum was prepared to inform water resource managers and policy-makers of the latest developments in local resources and conservation efforts. During the 2010 IRP process, six Issue Papers were prepared to address the local resource areas. The Issue Papers provided findings from workgroup discussions, described the current state of local supplies and programs, and provided recommendations for opportunities. The 2015 addendum was developed in a collaborative regional process with input from the IRP Member Agency Technical Workgroup, Water Use Efficiency Meetings, resource experts, and stakeholders. Issue Papers identified current and potential resources issues, opportunities, lessons learned in the interim period, and provided updated recommendations. Exhibit 10B summarizes the resource issues, opportunities, and recommendations.

Exhibit 10B: Resource Issues, Opportunities, and Recommendations

Issues	Opportunities	Recommendations[1]
	Conservation	
• Long-term commitment to conservation can be difficult to sustain during non-drought years. • Institutional objectives and priorities may not be aligned to promote water conservation. • Communicating to the retail level customers • Demand hardening makes further conservation increasingly difficult • Proposition 218 compliance regarding conserving water rate structures • Availability of water savings data	• Drought has created momentum • Technological advances are available to increase conservation • Consumer behavioral changes and market transformation have potential for future water savings	• Evaluate existing programs for areas of improvement. • Explore new programs and devices • Expand partnerships with government agencies and utilities • Continue to assist with model ordinances • Explore ways to communicate water use to the end user • Provide targeted outreach and education, including to land-use planners • Study successes in retail water pricing • Explore research opportunities and technology development • Develop opportunities for information sharing and program integration • Explore strategies to help incentivize additional water conservation

Issues	Opportunities	Recommendations[1]
Groundwater (including stormwater and other recharge)		
• Region is experiencing historic low groundwater levels • Urbanization reduces groundwater recharge and increases flood risk • Climate change may alter precipitation patterns • Costs/funding • Institutional challenges • Water quality • Operational and environmental issues	• Adjudication amendments increase flexibility for groundwater management • Regulatory changes maximize recycled water recharge • New treatment and brine disposal technologies • Collaboration on multi-benefit projects	• Explore opportunities to address ongoing threats to sustainability • Explore innovative project and partnership development • Continue to provide an avenue for open regional discussion on stormwater
Recycled Water		
• Lengthy and variable permitting process • Negative public perception and conflicting messaging • Costs • Source control and effluent water quality needs • Operational issues • Confliction institutional objectives	• Progress toward new regulatory process • Improving public perception • New funding opportunities • Partnerships • New technologies, research, and information sharing	• Explore opportunities to improve permitting process • Improve public education and awareness of water recycling • Explore various investments strategies such as incentives, ownership, and partnerships • Consider joint technical studies and projects
Seawater Desalination		
• New regulations affect future development • Costs • High energy use • Conflicting messaging	• Improve permitting process • Regional, state, and federal funding • Technology and innovation • Partnerships and collaboration with stakeholders • Communicating benefits	• Explore legislative, regulatory, and communications opportunities • Continue investment in new research, studies, and innovation • Investigate partnership opportunities for managing risk • Evaluate options for capacity building

Issues	Opportunities	Recommendations[1]
Stormwater Direct Use		
• Availability of supplies due to uncertain rainfall patterns • Operation and maintenance needs • Potential impacts to groundwater recharge and quality	• Rainwater capture is now available for non-potable uses without permitting requirements • Public awareness of water issues	• Evaluate a business case analysis and cost/benefit analysis for providing regional incentives • Continue to facilitate regional discussion on stormwater direct use • Encourage information sharing of challenges and lessons learned
Graywater		
• Permitting and regulations • Cost • Drain-line carry • Potential health and environmental risks • Potential conflict with other resources	• Changes to plumbing and building codes • Removed authority to prohibit graywater use • Public awareness increased due to drought	• Continue to encourage research • Explore additional public education efforts
Resource Interrelations		
• Water quality • Regulatory challenges • Costs and limited funding • Lack of public support	• Collaborations on multi-benefit projects • Collaboration on grant funding • Technology, research, and information sharing • Heightened public awareness and regulatory reform during drought • Optimizing resource interactions	• Explore partnership opportunities for multi-benefit approaches • Explore research and technology development opportunities • Investigate integrated regulatory, outreach, and education efforts • Explore integrating resource, programs, and planning opportunities • Explore funding strategies that improve economic feasibility of multi-benefit projects

[1] Recommendations do not obligate future policy or implementation for any agency, but instead aim to help advance the regional discussion on water resources issues.

Source: MWD, 2015 IRP Technical Update Issue Paper Addendum, October 27, 2015.

10.3.2 Stakeholder Participation

Like the preparation of previous IRPs, the development of MWD's 2015 IRP update was a collaborative effort. MWD sought input from its 26 public member agencies, retail water agencies, the public and other stakeholders including water and wastewater managers, environmental interests, and the business community. LADWP was an active member and participated in the technical workgroup meetings.

To provide more direct involvement by MWD's Board in the 2015 IRP Update preparation, the Board created an Integrated Resources Planning Committee composed of 17 Board of Directors. Los Angeles served as vice-chair of this committee. This committee met ten times throughout the 2015 IRP Update Process.

Throughout the development of the 2015 IRP Update, MWD member agencies met with MWD staff through an IRP Member Agency Technical Workgroup. The Technical Workgroup provided opportunities to provide guidance, discussion, and information-sharing on technical topics. This workgroup facilitated the transfer of member agency data and information necessary for updating the 2015 IRP Update forecasts, feedback, and development of policy topics for Phase 2. Updates on the IRP and UWMP were also provided during Member Agency Managers meetings and multiple other MWD related meetings and committees.

MWD recognized public involvement was an important element to incorporate into development of the 2015 IRP and UWMP. To encourage public involvement in the 2015 IRP Update and UWMP, MWD established three key objectives:

- Ensure that the 2015 IRP Update/ UWMP process is understandable and accessible to anyone interested;
- Provide opportunities for learning, dialogue, and input; and
- Create a pathway to encourage continued engagement in future policy discussions.

10.3.3 MWD's 2015 IRP Update Implications for City's Urban Water Management Plan

It is important to understand the significance of a reliable and cost-effective water supply from MWD. The City's water supply reliability is directly linked to MWD's reliability. Through its 2015 IRP Update, MWD has shown additional actions needed to maintain long term reliability, which is critical to the City during prolonged dry periods when Los Angeles Aqueduct supply and other local supplies may be significantly curtailed.

Chapter Eleven

Water Supply Reliability and Financial Integrity

11.0 Overview

Providing a reliable water supply in a semi-arid climate with high variability in weather is challenging. Since LADWP relies on imported water from the Los Angeles Aqueduct (LAA) and Metropolitan Water District of Southern California (MWD) for a significant amount of its total water supply, it is challenging to ensure water supply reliability. Imported surface supplies are highly variable due to climate and hydrology, and are also subject to environmental regulatory restrictions. To diversify its water supply portfolio and meet targets established in Mayor Garcetti's Executive Directive No. 5 (ED5) and LA's Sustainable City pLAn, LADWP has made and will continue to make significant investments in local groundwater, recycled water, stormwater capture, and water conservation. Local water supplies tend to be more reliable than imported water because they have less variability due to climate, weather, and environmental restrictions. Additionally, by investing in these local supplies, the City's urban environment can be protected and enhanced.

11.1 Unit Cost and Funding of Supplies

11.1.1 Unit Cost Summary of Supplies

Unit costs play an important role in planning future water supply development and determining where supply investments provide the greatest benefits to our customers. Unit costs of production vary dramatically by water supply source. Exhibit 11A summarizes the unit cost for each of LADWP's water supply sources.

Among LA's existing and planned water supplies, unit costs ranged from a high of $1,550/AF for certain stormwater capture projects to a low of $341/AF for locally produced groundwater. LAA supply requires operation and maintenance costs regardless of the amount of water the aqueduct delivers. Therefore, hydrology and increased water for environmental enhancements in the Eastern Sierras result in LAA unit costs fluctuating from year to year. During Fiscal Year (FY) 2014/15, the LAA experienced a sharp increase in unit cost due to the lowest LAA deliveries on record. Local groundwater supply is the least expensive source. However, its production is currently limited by groundwater basin contamination. Unit costs for MWD purchased water vary based on tier allocations. MWD's treated water rates for FY 2016 are $942/AF for Tier 1 and $1,076/AF for Tier 2. LADWP has a Tier 1 allocation of 335,663 AF. Any purchases above 3.35 million AF in a 10-year period will be at the Tier 2 rate. Conservation costs to LADWP have historically been minimal as the majority of incentives provided to LADWP's customers for installation of water-efficient fixtures and turf removal are paid by MWD through the region's Water$mart program. However, future costs for conservation savings that will be required to comply with the aggressive targets established in the City's pLAn will likely increase as MWD reduces funding and demand-hardening increases. Recycled water costs are project specific and vary widely depending on the infrastructure requirements of each project. Water transfers using a future connection between the LAA and the California Aqueduct are also planned. Water transfer costs will not only require the purchase of the water supply, but will also require payment of conveyance or wheeling fees to deliver the water into LADWP's system.

Unit costs for potential water supplies such as stormwater capture and reuse, as well as increased groundwater production from stormwater recharge are highly variable based on a variety of factors including the size of the overall program, project locations, etc. The SCMP presents not to exceed costs for infiltration ($1,100/AF) and direct use ($1,550/AF) in 2025, respectively. As described in Chapter 7, Watershed Management, the estimated costs are inclusive of the avoided cost of MWD Tier 1 untreated imported water and the value assigned by MWD for participation in MWD's Local Resource Program. Projects in excess of these amounts will be considered if partnerships or outside funding can reduce the unit cost to these specified levels. Projects in excess of the specified not to exceed levels may be considered by LADWP on a case by case basis.

Exhibit 11A
Unit Costs of Supplies for LADWP

Water Source	Chapter Reference	Average Unit Cost ($/AF)
Conservation[1,2]	Chapter 3 - Water Conservation	$50 - $1,300
Recycled Water	Chapter 4 - Recycled Water	$600 - $1,500
Los Angeles Aqueduct[3]	Chapter 5 - Los Angeles Aqueduct System	$1,481
Groundwater[3]	Chapter 6 - Local Groundwater	$341
Stormwater Capture[4]	Chapter 7 - Watershed Management	$1,100; $1,550
Metropolitan Water District[5]	Chapter 8 - Metropolitan Water District Supplies	$942 - $1,076
Water Transfers[6]	Chapter 9 - Other Potential Supplies	$220 - $770
Seawater Deslination[7]	Chapter 9 – Other Water Supplies	$1,500 - $3,000

1. Upper end of future conservation costs for LADWP to be determined from Water Conservation Potential Study.
2. MWD Funds conservation at $195/AF, our share is estimated at 15% of MWD's cost.
3. Los Angeles Aqueduct supply and groundwater supply are based on FY2010/11 – 2014/15 10 five-year average.
4. Costs presented are not to exceed costs for infiltration ($1,100/AF) and direct use ($1,550/AF) in 2025, respectively. Projects with higher per unit costs may be implemented if outside funding is obtained or partnerships are implemented. Additionally, LADWP may implement higher per unit cost projects on a case by case basis.
5. MWD water rates for treated water, tier 1 and tier 2, effective on January 1, 2016.
6. Excludes costs associated with wheeling.
7. Cost range presented in MWD Integrated Water Resources Plan 2015 Update.

11.1.2 Funding of Supplies

Funding for water resource programs and projects are primarily provided through LADWP water rates, with supplemental funding provided by the MWD, and state and federal grants. LADWP will also seek reimbursement from potential responsible parties to assist with groundwater treatment program costs.

Funding for water resources projects consists of the following:

- Water Rates – The revenue collected for the LADWP's water resource programs through water rates is the primary funding source to achieve projected goals in conservation, water recycling, stormwater capture, and remediation of contamination in the San Fernando Basin.

- MWD – Currently provides funding through their Local Resources Program (LRP) for the development of water recycling, groundwater recovery, and seawater desalination. The LRP incentive structure offers three options: sliding scale incentives up to $340/AF over 25 years, sliding scale incentives up to $475/AF over 15 years, or fixed incentives up to $305/AF over 25 years. MWD also promotes conservation through its Conservation Credits Program. Since its inception in 1990, the Conservation Credits Program has provided $487 million in rebates and incentives throughout its service area cumulatively saving 2.2 million AF through 2015.

- State Funds – Funds for water recycling, groundwater, water conservation, and stormwater capture have been available on a competitive basis though voter approved initiatives, such as Propositions 50, 84 and 1. Proposition 1 allocates $900 million to prevent or clean up contaminated groundwater. Occasionally low or zero-interest loans are also available through State Revolving Fund programs.

- Federal Funds – Federal funding for water recycling is available through the U.S. Army Corps of Engineers, via periodic Water Resource Development Act legislation, and the U.S. Bureau of Reclamation's Title XVI program.

- Potentially Responsible Parties – LADWP may be able to recover some costs for groundwater cleanup from potentially responsible parties.

Receipt of state or federal funding will allow water resource goals to be achieved sooner than projected, or allow for increased local supply development.

11.2 Reliability Assessment Under Different Hydrologic Conditions

11.2.1 Los Angeles Aqueducts

Water supply from the LAA can vary substantially from year to year due to hydrology. In very wet years, LAA supply can exceed 500,000 AFY. The LAA historical average is based on the 50-year average hydrology from FY 1961/62 to 2010/11. During average year weather conditions, the LAA supply is projected to increase from 275,700 AFY in 2020 to 293,400 AFY in 2025 in response to water savings from Owens Lake Dust Mitigation after the implementation of the Master Project in 2024. However, over time the overall supply source is expected to decline as a result of climate change at 0.1652% annually resulting in a reduction of more than 10,000 AFY in the next 25 years. Critical dry year (defined as a repeat of FY 2014/15 drought) supplies can be as low as 32,000 AFY.

In the last decade, environmental considerations have required the City to reallocate approximately one-half of the LAA water supply to environmental mitigation and enhancement projects. Reducing water deliveries to the City from the LAA has resulted in an increased dependence on imported water supply from MWD. However, as outlined in pLAn, the City has set a target to reduce imported water purchases from MWD by 50 percent from FY 2013/14 levels.

11.2.2 Groundwater

Groundwater is also affected by local hydrology. However, the groundwater basins are operated utilizing conjunctive use management practices, which is to reduce production to increase the storage of water in the groundwater basins during wet years and to increase production to remove water from storage during dry years. During average weather conditions through FY 2039/40, LADWP projects that on a safe yield basis it may pump between 106,670 AFY and 114,670 AFY of groundwater, excluding stormwater recharge and groundwater replenishment supplies. These projections are based on multiple assumptions: (1) Basin groundwater elevations can support this level of pumping on a safe yield basis (2) LADWP's planned Groundwater Treatment Facilities will be operational in FY 2021/22; (3) groundwater storage credits of 5,000 AFY will be used to maximize production in FY 2019/20 and thereafter; and (4) Sylmar Basin production will increase to 4,170 AFY from FY 2015/16 to FY 2038/39 to avoid expiration of stored water credits and then return to the entitlement of 3,570 AFY in 2039/40. Although in dry years LADWP can pump larger quantities of groundwater, a more conservative approach was adopted by assuming the same level of projected groundwater production for both single dry year and multi-dry year analysis.

Groundwater is vulnerable to contamination. The contamination clean-up in San Fernando Basin will facilitate groundwater replenishment utilizing advanced treated recycled water and stormwater recharge for future extraction, which are critical to ensuring the future reliability of the City's groundwater supplies. The Groundwater Treatment Facilities will remediate San Fernando Basin and restore LADWP's ability to fully utilize its local groundwater entitlements, and will facilitate additional storage and extraction programs.

11.2.3 Conservation

The ED5 and Sustainable City pLAn include water use efficiency targets of reducing per capita water use by 20 percent by 2017 and 25 percent by 2035 from FY 2013/14 levels, respectively. LADWP is planning to reduce potable water use levels by an additional 125,800 AFY by 2020, and from 2020 to 2040, LADWP plans to maintain these aggressive reduction levels to achieve LA's Sustainable City pLAn goals.

Since 2014, LADWP has already achieved a significant amount of active and passive conservation through its ED5 conservation strategies and is on track to meet the ED5's 2017 target of 20 percent reduction. A significant portion of the passive conservation achievements from ED5 will be sustained permanently and will continue to contribute to meeting the long-term pLAn targets from 2020 through 2040. In addition, LADWP has recently implemented multiple new initiatives, such as its new rate structure and amendments to the Emergency Conservation Plan Ordinance, and plans to develop additional passive conservation programs to help further increase passive savings through 2040.

As discussed in Chapter 3, LADWP's Water Conservation Potential Study (WCPS) will determine the remaining conservation potential from water-efficient appliances. LADWP will use the final results from the WCPS to help develop its future Conservation

Program. A combination of active and passive conservation strategies will be implemented to develop a Conservation Program that is cost-effective and helps achieve the pLAn targets from 2020 to 2040.

Conservation can be seen as both a demand control measure and/or a source of supply. Of the local supplies being pursued, additional planned conservation is the biggest contributor toward reducing MWD purchases and increasing local supply reliability through 2040 and is therefore considered to be a crucial supply asset for LADWP.

11.2.4 Recycled Water

Recycled water is derived from wastewater effluent flows, which do not vary significantly due to hydrology. Therefore, recycled water use is mainly limited by system capacities and demands. These facts make recycled water a more reliable supply than imported water. As outlined in Chapter 4, Recycled Water, LADWP is planning extensive expansion of its recycled water system not only to include expansion of irrigation and industrial uses, but also to include groundwater replenishment. Under average weather conditions, recycled water supply for irrigation and industrial purposes is projected to increase from 10,000 AFY in 2015 to 45,400 AFY by 2040. Groundwater replenishment with recycled water is projected to be 30,000 AFY by 2024. During a critical dry year, available recycled water supplies would not change.

11.2.5 Stormwater Capture

Capturing stormwater for groundwater recharge is essential to maintaining groundwater supplies, addressing the decrease in stored groundwater, protecting the safe yield of the groundwater basin, and ensuring the long-term water supply reliability of the San Fernando Basin (SFB). Proposed centralized stormwater capture projects will enable the City to utilize its stored water credits in a sustainable manner and prevent conditions of overdraft in the basin. The UWMP projects that by 2040 there will be a minimum of 15,000 AFY of increased groundwater pumping in the SFB due to water supply augmentation through centralized stormwater infiltration. Anticipating that groundwater basin elevations will respond to enhanced groundwater replenishment, LADWP will work with the ULARA Watermaster to continue observing actual water levels and re-evaluate basin safe yield to allow additional increases in groundwater production over time as SFB elevations rebound.

By 2040, the UWMP projects 400 AFY in dry years or 2,000 AFY in average years of additional water savings through distributed direct use stormwater capture projects offsetting potable water use. These water savings contribute to the overall water conservation goal to meet Mayor's water use reduction targets.

11.2.6 MWD Imported Supplies

LADWP has historically purchased MWD water to make up the deficit between in-City demand and local supplies. The City has relied on MWD water to a greater extent during dry years when LAA deliveries diminish. Recently, the LAA supplies have been reduced by the current drought and increased environmental mitigation and enhancement demands. However, pLAn sets a target for the City to ultimately reduce dependence on imported water by 50 percent by 2025 from FY 2013/14 levels. This reliability assessment takes into account this target and reduces reliance on MWD even as demands continue to increase during average weather years. During dry years LA will continue to rely on MWD to provide supplies when LAA supply availability declines during droughts.

Historically, water supplies feeding the MWD system (like LADWP supplies from the LAA) have been subject to variability due to water shortages (i.e., 1976/77, 1987-1992, 2007-2010, and the current drought). This is a result of MWD's core sources of water supply being the Colorado River and SWP, both of which are affected by hydrology. More recently, the current drought coupled with restrictions to protect threatened fish species have decreased pumping from the Bay-Delta, and limited SWP supplies available to MWD. After the 1987-1992 water shortage, MWD started to diversify its water supply portfolio. Partnering with its member agencies, MWD launched its first Integrated Resource Plan (IRP) in 1993, and most recently updated Phase 1 of the 2015 IRP Update in January 2016. Phase 2 of the 2015 IRP Update will consider implementation policies to reach the resources targets established in Phase 1. Together both phases will serve as MWD's strategic plan for water reliability through 2040.

MWD's past IRP efforts have resulted in implementation of a variety of projects and programs designed to reduce its dependency on imported water during water shortages and environmental triggering of SWP pumping restrictions. Efforts have included: (1) providing financial incentives for local projects and conservation; (2) increasing surface storage via Diamond Valley Lake, Lake Mead, and the use of SWP terminal reservoirs; (3) groundwater storage programs in the Central Valley, Imperial Valley, and Coachella Valley; (4) short- and long-term water transfers; and (5) contracted groundwater storage programs with participating member agencies.

Phase 1 of the 2015 IRP Update builds upon the adaptive management approach adopted with the 2010 IRP Update. MWD will manage future risk and uncertainty through the 2015 IRP Update's adaptive management strategy. The strategy focuses on stabilizing and maintaining imported supplies, using increased conservation, sustaining and developing new local supplies, developing a transfer and exchange strategy, and accumulating storage in wet and normal years. These future supply actions, which are low cost and low risk actions designed to accelerate developments on an as needed basis, are key part of the IRP's adaptive management strategy.

MWD's 2015 Urban Water Management Plan indicates that MWD will continue to provide 100 percent reliability through 2040 for its member agencies during average (1922 – 2012 hydrology), single dry (1977 hydrology), and multiple dry years (1990 - 1992 hydrology). For each of these scenarios there is a projected surplus of supply in every forecast year (see Exhibit 11B). The projected surpluses are based on the capability of current supplies and range from 0.1 percent to 87 percent. When including supplies under development for all scenarios, the potential surplus ranges from 5 percent to 11 percent of projected demand.

Exhibit 11B
MWD Supply Capability and Projected Demands (in AFY)

Single Dry Year MWD Supply Capability and Projected Demands (1977 Hydrology)					
Fiscal Year	2020	2025	2030	2035	2040
Capability of Current Supplies	2,584,000	2,686,000	2,775,000	2,905,000	2,941,000
Projected Demands[1]	2,005,000	2,066,000	2,108,000	2,160,000	2,201,000
Projected Surplus	579,000	620,000	667,000	745,000	740,000
Projected Surplus % (Proj. Surplus/Proj. Demands)	29%	30%	32%	34%	34%
Supplies under Development	63,000	100,000	316,000	358,000	398,000
Potential Surplus	642,000	720,000	983,000	1,103,000	1,138,000
Potential Surplus % (Potential Surplus/Proj. Demands)	32%	35%	47%	51%	52%
Multiple Dry Year MWD Supply Capability and Projected Demands (1990-1992 Hydrology)					
Fiscal Year	2020	2025	2030	2035	2040
Capability of Current Supplies	2,103,000	2,154,000	2,190,000	2,242,000	2,260,000
Projected Demands[1]	2,001,000	2,118,000	2,171,000	2,216,000	2,258,000
Projected Surplus	102,000	36,000	19,000	26,000	2,000
Projected Surplus % (Proj. Surplus/Proj. Demands)	5%	2%	1%	1%	0.1%
Supplies under Development	43,000	80,000	204,000	245,000	286,000
Potential Surplus	145,000	116,000	223,000	271,000	288,000
Potential Surplus % (Potential Surplus/Proj. Demands)	7%	5%	10%	12%	13%
Average Year MWD Supply Capability and Projected Demands (1922 - 2012 Hydrology)					
Fiscal Year	2020	2025	2030	2035	2040
Capability of Current Supplies	3,448,000	3,550,000	3,658,000	3,788,000	3,824,000
Projected Demands[1]	1,860,000	1,918,000	1,959,000	2,008,000	2,047,000
Projected Surplus	1,588,000	1,632,000	1,699,000	1,780,000	1,777,000
Projected Surplus % (Proj. Surplus/Proj. Demands)	85%	85%	87%	89%	87%
Supplies under Development	63,000	100,000	386,000	428,000	468,000
Potential Surplus	1,651,000	1,732,000	2,085,000	2,208,000	2,245,000
Potential Surplus % (Potential Surplus/Proj. Demands)	89%	90%	106%	110%	110%

Source: MWD 2015 Urban Water Management Plan, Tables 2-4 to 2-6.

1. Total demands Imperial Irrigation District and San Diego County Water Authority Transfers and canal linings

As part of the implementation of MWD's IRP, MWD and its member agencies worked together to develop MWD's Water Surplus and Drought Management Plan (WSDM Plan) in 1999. The WSDM Plan established broad water resource management strategies to ensure MWD's ability to meet full service demands at all times and provides principles for supply allocation if the need should ever arise. The WSDM Plan splits MWD's resource actions into two major categories: Surplus Actions and Shortage Actions. The Shortage Actions of the WSDM Plan are split into three sub-categories: Shortage, Severe Shortage, and Extreme Shortage. Under Shortage conditions, MWD will make withdrawals from storage and interrupt long-term groundwater basin replenishment deliveries. Under Severe Shortage conditions, MWD will call for extraordinary drought conservation in the form of voluntary savings from retail customers, interrupt 30 percent of deliveries to Agricultural Water Program users, call on its option transfer water, and purchase water on the spot market. The overall objective of MWD's IRP is to ensure that shortage allocations of MWD water supplies are minimized.

Under Extreme Shortage conditions, MWD allocates supplies to its member agencies in accordance with its Water Supply Allocation Plan (WSAP). If shortage allocations are required, MWD will rely on the calculations established in its WSAP initially adopted in 2008 with the latest amendment adopted in 2014. The plan allocates shortages among its member agencies based on need with adjustments for growth, local investments, changes in supply conditions, demand hardening, water conservation programs, and drought impacted groundwater basins.

11.2.7 Water Transfers

Water transfers are being developed as a potential supply to replace a portion of the City's Los Angeles Aqueduct water that has been dedicated for environmental enhancement in the Eastern Sierra Nevada, and to provide increased operational flexibility and cost savings for LADWP customers. Water acquired through transfers helps increase water supply reliability for the City. The Los Angeles Aqueduct and California Aqueduct interconnection, known as the Neenach Pumping Station, is expected to be operational by 2017/18. LADWP may potentially enter agreements to obtain up to 40,000 AFY under average weather conditions, if market water transfers are available.

11.2.8 Service Area Reliability Assessment

To determine the overall service area reliability, LADWP defined three hydrologic conditions: average year (50-year average hydrology from FY 1961/62 to 2010/11); single-dry year (such as a repeat of the FY 2014/15 drought); and multi-dry year (such as a repeat of FY 2012/13 to FY 2014/15). These defined conditions are used to determine the corresponding level of LAA water supply. The corresponding demand under each hydrologic condition is also determined. The average year demand is based on the forecasted median demand as shown in Exhibit 2K. Weather patterns and water demands were further studied to determine single dry year demand and multi-dry year demands. The single-dry and multi-dry year demands are estimated to be 5 percent higher than the forecasted median demand.

The water supply reliability summaries are shown in Exhibit 11C through 11E. Exhibit 11C illustrates the 5-year average from FY 2010/11 to FY 2014/15, Exhibit 11D illustrates single-dry and multi-dry year conditions for FY 2039/40, and Exhibit 11E illustrates the average year condition for FY 2039/40. The projected supply portfolio under multiple dry year conditions is almost identical to that under single dry year conditions. New water conservation is shown as a combined supply source with stormwater reuse. Groundwater is combined with increased pumping due to groundwater replenishment with purified wastewater and captured stormwater. The exhibits show that the City's locally-developed supplies will increase from the current 14 percent to 49 percent in dry years, or to 47 percent in average years. These local supplies are not influenced by variability in hydrology and will become the cornerstone of LA's future water supplies. As a result, the City's combined imported supplies will decrease significantly from the current 86 percent to 51 percent in dry years, or to 53 percent in average years. As for the breakdown of the City's imported supplies, it is still highly influenced by hydrology. The Los Angeles Aqueduct system has limited storage capacity and is therefore subject to the variability of hydrology while MWD (with its ample storage) is capable of providing supplemental water supply to the City with less variability due to hydrologic conditions. By FY 2039/40 LAA deliveries are projected at 7 percent in dry years and 42 percent in average years, MWD will make up the remaining 44 percent in dry years or 11 percent in average years to meet the City's need for supplemental water.

Exhibit 11C
LADWP Supply Reliability FYE 2011-2015 Average

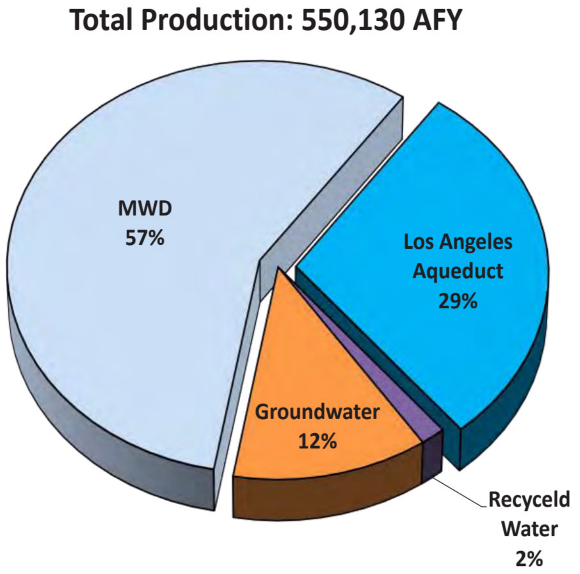


Exhibit 11D
LADWP Supply Reliability Under Single/Multiple Dry Year Conditions in Fiscal Year 2039-40

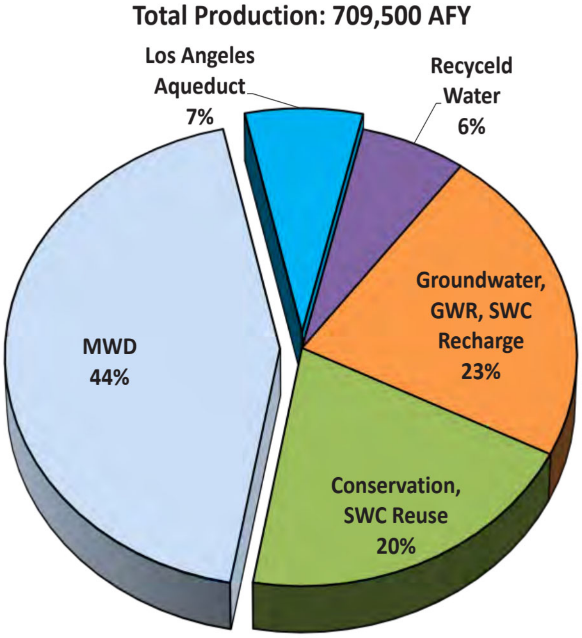
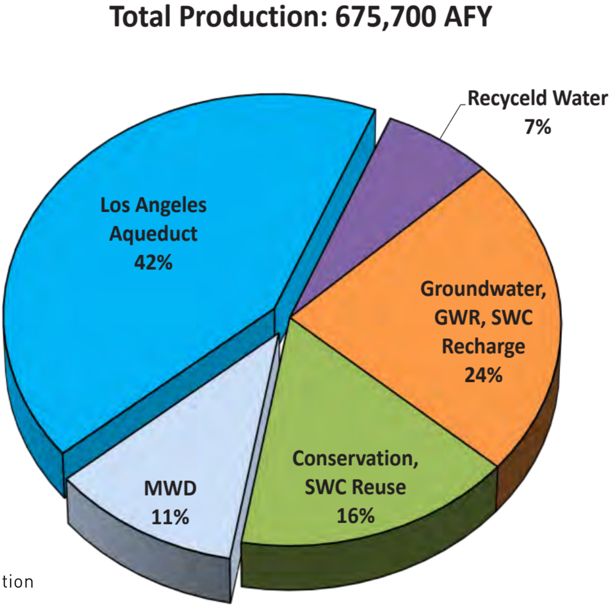


Exhibit 11E
LADWP Supply Reliability Under Average Year Conditions in Fiscal Year 2039-40



Note: Charts do not reflect
118,034 AF of existing conservation

Exhibits 11F through 11H tabulate the service reliability assessment for single dry year, multiple dry year, and average year conditions, respectively. For these reliability tables, existing water conservation has already been subtracted from projected demands, but new water conservation is included as a supply source. Demands are met by the available supplies under all scenarios. In addition to the total water demand, Tables 11F through 11H provide projected water demands aligned to The Sustainable City pLAn's targets.

Exhibit 11F
Service Area Reliability Assessment for Single Dry Year

Demand and Supply Projections (in acre-feet)	Single Dry Year (FY2014-15) Fiscal Year Ending on June 30				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	156,700	143,700	145,100	143,500	143,500
Los Angeles Aqueduct[4]	32,200	51,900	51,400	51,000	50,600
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	100	200	300	300	400
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	323,470	369,470	380,470	396,670	398,970
MWD Water Purchases					
With Existing/Planned Supplies	318,930	307,430	305,030	298,230	310,530
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	278,930	267,430	265,030	258,230	270,530
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
5. Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.
6. Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Exhibit 11G
Service Area Reliability Assessment for Multi-Dry Years (2011-2015)

Demand and Supply Projections (in acre-feet)	Multiple Dry Years (FY 2012-13 to FY2014-15) Fiscal Year Ending on June 30				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	156,700	143,700	145,100	143,500	143,500
Los Angeles Aqueduct[4]	33,500	53,200	52,800	52,400	51,900
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	100	200	300	300	400
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	324,770	370,770	381,870	398,070	400,270
MWD Water Purchases					
With Existing/Planned Supplies	317,630	306,130	303,630	296,830	309,230
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	277,630	266,130	263,630	256,830	269,230
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118, 034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
5. Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.
6. Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Exhibit 11H
Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	**Average Weather Conditions (FY 1961/62 to 2010/11) Fiscal Year Ending on June 30**				
	2020	**2025**	**2030**	**2035**	**2040**
Total Water Demand[1]	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	125,800	110,900	111,600	109,100	108,100
Los Angeles Aqueduct[4]	275,700	293,400	291,000	288,600	286,200
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	400	800	1,200	1,600	2,000
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	536,370	578,770	587,470	601,170	600,770
MWD Water Purchases					
With Existing/Planned Supplies	75,430	65,930	65,430	60,630	74,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	35,430	25,930	25,430	20,630	34,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
5. Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.
6. Potential water transfer occurs in dry years with stored water acquired in average and wet years.

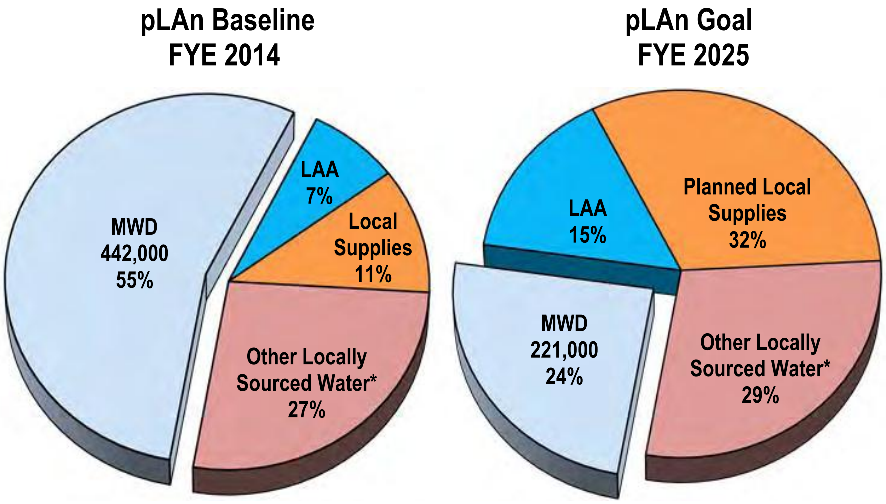
11.3 Sustainable City pLAn Targets for Conservation and Local Supplies

In April 2015 the Mayor released the City's first ever Sustainable City pLAn (pLAn), with a long term focus of improving the environment, economy, and equity in Los Angeles. The pLAn contains a number of water resources goals to:

- Reduce average per capita potable water use by 20 percent from FY 2013/14 by 2017
- Reduce average per capita potable water use by 22.5 percent from FY 2013/14 by 2025
- Reduce imported water purchases from MWD by 50 percent from 2013/14 by 2025
- Reduce per capita potable water use by 25 percent from 2013/14 by 2035
- Expand all local sources of water so that they account for at least 50 percent of the total supply by 2035

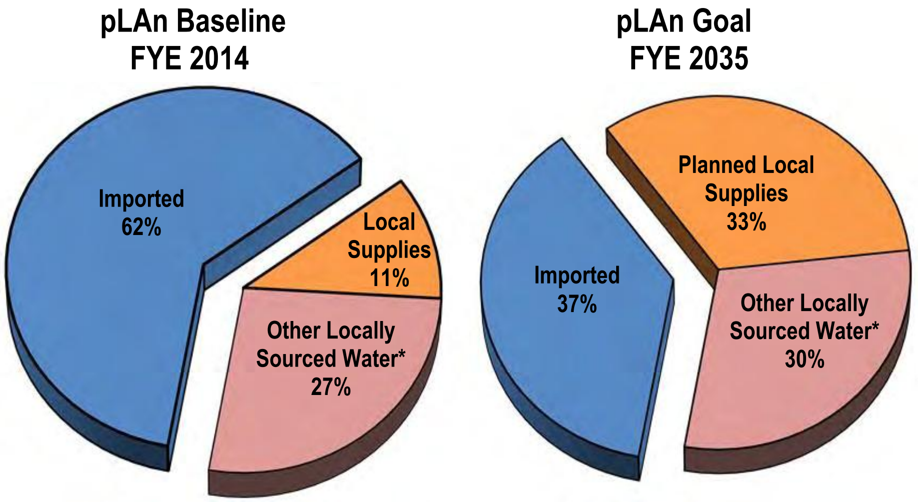
Using the average year 2025 and 2035 supply projections for the LAA, recycled water, groundwater, conservation savings, and stormwater capture (inclusive of historical conservation, stormwater capture, and beneficial reuse of treated wastewater), LADWP's long term strategy for reliability can meet all of the water resources goals established in the City's pLAn. Exhibit 11I illustrates the significant contributions of the additional local supply development in achieving the pLAn's targeted reduction of imported water purchases from MWD by 50 percent in the year 2025. In FY 2013/14 MWD purchases were 442,000 AFY. In FY 2025, accounting for the planned local supplies summarized in Section 11.2, MWD purchases under most hydrologic conditions will be 221,000 AFY or less. Only during extreme dry hydrologic conditions for the LAA (approximately 11 percent of the time) will MWD purchases be greater than the target established by the City's pLAn.

Exhibit 11I
Achieving 50 Percent Reduction in MWD Water Purchases by 2025



*Other Locally Sourced Water consists of: Historical Conservation, Stormwater Capture, Beneficial Reuse/Other

Exhibit 11J
Expanding Local Sources of Water to Account for 50 Percent of Total Supply by 2035



*Other Locally Sourced Water consists of: Historical Conservation, Stormwater Capture, Beneficial Reuse/Other

Exhibit 11J presents how the target of expanding locally-sourced water to achieve 50 percent local water supply by 2035 will be accomplished. In FY 2013/14 all local sources of water (inclusive of historical conservation, stormwater capture and beneficial reuse of treated wastewater) accounted for 38 percent of the total water supply. In FY 2035, accounting for the planned local supplies summarized in Section 11.2, all local sources of water are projected to account for 63 percent of the total water supply.

11.4 Water Shortage Contingency Plan

The Los Angeles City Municipal Code Chapter XII, Article I, Emergency Water Conservation Plan (Appendix I) is the City's water shortage contingency plan (or "ordinance"). It was developed to provide for a sufficient and continuous supply of water in case of a water supply shortage in the service area. There are two scenarios that can cause a water shortage: 1) a severe hydrologic dry period affecting surface and groundwater supplies and 2) a catastrophic event that severs major conveyance and/or distribution pipelines serving water to the City. On June 12, 2015, Los Angeles adopted an amendment to the Emergency Water Conservation Plan Ordinance providing more options for restricting outdoor water use and to add a sixth phase. On May 3, 2016, additional amendments to the Emergency Water Conservation Plan Ordinance were adopted to increase existing surcharges for ordinance violations, create unreasonable use of water penalties, and incorporate the use of technology to improve ordinance enforcement. The City is currently in Phase 2 and has been in this stage since 2009. The following discusses LADWP's compliance with the UWMP Act as outlined in Section 10632 (a) (1) through (9) of the California Water Code.

11.4.1 Stages of Action – 10632 (a) (1)

As set forth in the Emergency Water Conservation Plan, the City has conservation phases or stages of action that can be undertaken in response to water supply shortages. Although there are no specific percentages of water shortage levels assigned to each phase, LADWP continually monitors water supplies and demands on a monthly basis. As necessary, LADWP's Board of Water and Power Commissioners makes recommendations to the Mayor and City Council on the suggested conservation phase to address the water shortage conditions.

The implementation of progressive conservation phases will cope with a 50 percent or greater reduction in water supplies and roughly correspond to the water shortage percentages described below:

No Shortage, Phase I (0 to 15 percent reduction)

Phase I prohibited uses of water are in effect at all times within the City. These prohibited uses, defined in article 10632 (a) (4) (see section 11.4.4), are intended to eliminate waste and increase public awareness of the need to conserve water. There are further stages of compounding actions in addition to the Phase I prohibited uses that might be imposed. Phase II to Phase VI progressively responds to different severities of shortage and implement additional prohibited uses of water.

Moderate Shortage, Phase II (roughly corresponding to 15 to 20 percent reduction)

1. Should Phase II be implemented, uses applicable to Phase I shall continue to be applicable, except as specifically provided herein.

2. No landscape irrigation shall be permitted on any day other than Monday, Wednesday, or Friday for odd-numbered street addresses and Tuesday, Thursday, or Sunday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to: (a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight minutes per watering day per station for a total of 24 minutes per week; (b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 90 minutes per week.

3. Upon written notice to LADWP, irrigation of sports fields may deviate from non-watering days to maintain play areas and accommodate event schedules; however, to be eligible for this means of compliance, a customer must reduce his overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 5 percent from the customer baseline water usage within 30 days.

4. Upon written notice to LADWP, large landscape areas may deviate from the non-watering days by meeting the following requirements (1) must have approved weather-based irrigation controllers registered with LADWP (eligible weather-based irrigation controllers are those approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative (2) must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 5 percent from the customer baseline water usage within 30 days; and (3) must use recycled water if it is available from LADWP.

5. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase II except between the hours of 9:00 am and 4:00 pm.

Significant Shortage, Phase III (roughly corresponding to 20 to 25 percent reduction)

1. Should Phase III be implemented, uses applicable to Phases I and II shall continue to be applicable, except as specifically provided herein.

2. No landscape irrigation shall be permitted on any day other than Monday or Friday for odd-numbered street addresses and Sunday and Thursday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to: (a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight minutes per watering day per station for a total of 16 minutes per week; (b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 60 minutes per week.

3. Recommended use of pool covers to decrease water loss from evaporation.

4. Recommended washing of vehicles at commercial car wash facilities.

5. Upon written notice to LADWP, irrigation of sports fields may deviate from the specific non-watering days to maintain play areas and accommodate event schedules. To be eligible for this means of compliance, a customer must reduce their overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 5 percent from the customer baseline water usage within 30 days.

6. Upon written notice to LADWP, large landscape areas may deviate from the specific non-watering days by meeting the following requirements (1) must have approved weather-based irrigation controllers registered with LADWP (eligible weather-based irrigation controllers are those approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative (2) must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 5 percent from the customer baseline water usage within 30 days; and (3) must use recycled water if it is available from LADWP.

7. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase III except between the hours of 9:00 am and 4:00 pm.

Severe Shortage, Phase IV (roughly corresponding to 25 to 35 percent reduction)

1. Should Phase IV be implemented, uses applicable to Phases I, II, and III shall continue to be applicable, except as specifically provided herein.

2. No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street addresses and Tuesday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to: (a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight minutes per watering day per station for a total of eight minutes per week; (b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 30 minutes per week.

3. Mandate use of pool covers on all residential pools when not in use.

4. No washing of vehicles except at commercial car wash facilities.

5. No filling of decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes, with potable water.

6. Upon written notice to LADWP, irrigation of sports fields may deviate from the specific non-watering days. To be eligible for this means of compliance, a customer must reduce their overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 10 percent from the customer baseline water usage within 30 days.

7. Upon written notice to LADWP, large landscape areas may deviate from the specific non-watering days by meeting the following requirements (1) must have approved weather-based irrigation controllers registered with LADWP (eligible weather-based irrigation controllers are those approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative (2) must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 10 percent from the customer baseline water usage within 30 days; and (3) must use recycled water if it is available from LADWP.

8. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase III except between the hours of 9:00 am and 4:00 pm.

Critical Shortage, Phase V (roughly corresponding to 35 to 50 percent reduction)

1. Phase I, II, III, and IV shall continue to remain in effect.

2. No landscape irrigation allowed.

3. No filling of residential swimming pools and spas with potable water.

4. Upon written notice to LADWP, golf courses and professional sports fields may apply water to sensitive areas, such as greens and tees, during non-daylight hours and only to the extent necessary to maintain minimum levels of biological viability.

Super Critical Shortage, Phase VI (roughly corresponding to greater than a 50 percent reduction)

1. Phase I, II, III, IV, and V shall continue to remain in effect.

2. The Board of Water and Power Commissioners is hereby authorized to implement additional prohibited uses of water based on the water supply situation. Any additional prohibitions shall be published at least once in a daily newspaper of general circulation and shall become effective immediately upon such publication and shall remain in effect until cancelled.

Unreasonable Use of Water

It shall be unlawful for any Customer to waste, or engage in the unreasonable use of water. If any SingleFamily Residential Customer enters the Department's highest rate tier during Phase II-VI, that Customer may be subject to a Water Use Analysis performed by the Department. Department will use available resources, including, but not limited to, water consumption history, land use data, and aerial photographs, to analyze the reasonableness of a Customer's water use.

1. **Notification.** Department may issue a notification to a Customer requesting access to the property for purposes of completing a Water Use Analysis. Within thirty (30) days following written notification by the Department, to the Customer's billing address, the Customer shall provide the Department reasonable access to the property for purposes of completing a Water Use Analysis and for verifying compliance with any existing Customer Conservation Plan.

2. **Cooperation.** Customer, or his designated representative, shall be present and fully cooperate with the Department in the Water Use Analysis, including, but not limited to providing water use information relating to landscaping, agriculture, fixtures, ponds, cooling towers, and other water features and uses located on the property.

3. **Customer Conservation Plan.** Upon completion of the Water Use Analysis, Department may prepare a Customer Conservation Plan that includes an evaluation of all water uses on the property, directions to reduce waste and unreasonable use of water, and a water budget based on the reasonable use of water on the property. Department will discuss with the Customer the findings of the Water Use Analysis and explain the Customer Conservation Plan.

4. The Department shall adopt criteria and process for implementing the Water Use Analysis. When possible the Department will use approved industry standards and methodologies to calculate indoor and outdoor water use.

5. Customer shall comply with all terms of the Department's Customer Conservation Plan, including any water budget provided by Department, and failure to comply shall be deemed an unreasonable use of water that is a threat to public health, safety and welfare and is deemed a nuisance pursuant to Government Code § 38771.

6. **Violation.** Customer failure to (1) provide reasonable access to property following notice, (2) cooperate with Department in the development of a Customer Conservation Plan, or (3) comply with Customer Conservation Plan shall be deemed a new violation of this section, and shall be noticed by the Department by written citation. Violation of this section shall subject Customer to penalties as described in Section 10632 (a) (6).

11.4.2 Driest Three-Year Supply – 10632 (a) (2)

In the event that three consecutive dry-years curtailing the City's LAA System deliveries should follow the FY 2014/15 water supply conditions, LADWP will rely on increased groundwater pumping and purchases from MWD to meet City water demands. This particular sequence is quantified in Exhibit 11K, including relevant assumptions.

Exhibit 11K
Driest Three-Year Water Supply Sequence

Demand and Supply Projections (in acre-feet)	Actual FY	Driest Three Consecutive Years (FY2012-13 to FY2014-15) Fiscal Year Ending on June 30		
	2015	2016	2017	2018
Total Water Demand[1]	**520,905**	**538,900**	**580,700**	**601,300**
pLAn Water Demand Target		**492,300**	**478,700**	**484,300**
Existing / Planned Supplies				
Conservation (Additional Active[2] and Passive[3] after FY14/15)	0	46,600	102,000	116,900
Los Angeles Aqueduct[4]	57,535	77,800	111,400	33,700
Groundwater[5] (Net)	90,438	72,803	73,641	90,748
Recycled Water				
- Irrigation and Industrial Use	10,421	11,000	13,000	19,000
- Groundwater Replenishment	0	0	0	0
Stormwater Capture				
- Stormwater Reuse (Harvesting)	0	0	0	100
- Stormwater Recharge (Increased Pumping)	0	0	0	0
Storage Change	96	0	0	0
Subtotal	158,394	208,203	300,041	260,448
MWD Water Purchases				
With Existing/Planned Supplies	362,607	330,697	280,659	340,852
Total Supplies	**520,905**	**538,900**	**580,700**	**601,300**

1. Total Demand with existing passive conservation
2. Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.
3. Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.
4. LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.
5. Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.

During such severe drought periods, the City's supplemental water supplier MWD will use its WSAP in conjunction with the framework developed in its WSDM Plan. Developed by MWD with substantial input from its member agencies, the WSDM Plan provides for the WSAP's needs-based allocation strategy, and establishes priorities for the use of MWD's water supplies to achieve retail reliability.

The following are actions that could be taken by MWD, in accordance with their WSDM Plan, to augment its water supplies prior to implementation of any WSAP drought allocation action:

1. Draw on Diamond Valley Lake storage.
2. Draw on out-of-region storage such as Semitropic and Arvin-Edison Groundwater Banks.
3. Reduce/suspend local groundwater replenishment deliveries.
4. Draw on contractual groundwater storage programs in MWD's service area.
5. Draw on State Water Project terminal reservoir storage (per Monterey Agreement).
6. Call for voluntary conservation and public education.
7. Call on water transfer options contracts.
8. Purchase transfers on the spot market.
9. Allocate imported water in accordance with the WSAP if necessary.

In 2008 MWD adopted the WSAP which is designed to allocate supplies among its member agencies in a fair and efficient manner. MWD's latest revisions were adopted on December 9, 2014 in response to a third year of severe drought and mandatory supply allocations in 2015. The WSAP establishes the formula for calculating member agency allocations if MWD cannot meet firm demands in a given year.

11.4.3 Catastrophic Supply Interruption Plan – 10632 (a) (3)

11.4.3.1 Seismic Assessment of Major Imported Supplies

MWD performed a seismic risk assessment of its water distribution network to evaluate the impacts of seismic activity in the greater Southern California area. For MWD, there are three sources of imported water to the region: the Colorado River Aqueduct (CRA), the East SWP branch, and the West SWP branch. Each source was evaluated for the potential of failure during a seismic event. The SWP East branch is considered more vulnerable because the California Aqueduct's alignment follows the San Andreas fault-line and crosses over the San Andreas Fault at multiple locations. The SWP West branch and CRA are somewhat less vulnerable due to their proximity to the San Andreas fault-line, although the San Andreas Fault crosses all aqueducts entering the Southern California region. It crosses the SWP East branch three times, the SWP West branch once, the CRA once, and the LAA once. MWD has determined its Diamond Valley Lake, SWP terminal reservoir storage, and member-agency emergency storage can adequately provide for a six-month supply of water for the entire MWD service area with a temporary 25 percent reduction in demand. MWD's engineering studies have shown six months is an adequate time to repair and resume deliveries from the SWP.

LADWP investigated the ability of MWD to deliver Colorado River water into the west San Fernando Valley in the event that SWP supplies and LAA supplies are interrupted. This investigation included the two MWD service areas adjacent to the West San Fernando Valley, the Calleguas and Las Virgenes Municipal Water Districts. If imported supply from the SWP and LAA are severed, MWD has prolonged emergency storage in Castaic and Pyramid Lakes. Given the proximity of MWD infrastructure to seismic activity on the San Andreas Fault, MWD staff predicts that if Castaic and Pyramid Lakes become disconnected from the City emergency repairs can be made to ensure that supply is not interrupted for an extended period of time. In a worst case scenario, if these sources are cut off from the City, 50 cubic feet per second of CRA water could be moved through MWD's system to serve the west San Fernando Valley, Calleguas MWD, and Las Virgenes MWD until repairs to the MWD facilities could be made. On-call contractors working around the clock could be deployed to repair seismic damage in as short as a two-week time period depending on the severity and location of the break(s). Due to these risks MWD's current storage policy is to maintain maximum emergency storage in both Pyramid and Castaic Lakes.

11.4.3.2 Emergency Response Plan

LADWP has Emergency Response Plans (ERPs, revised January 2016) in place to restore water service for essential use in the City if a disaster, such as earthquakes and power outages, should result in the temporary interruption of water supply. Department personnel responsible for water transportation, distribution, and treatment have established ERPs to guide the assessment, prioritization, and repair of City facilities that have incurred damage during a disaster.

An Emergency Operations Center (EOC) serves as a centralized point for citywide management of information about disasters and for coordination of all available resources. The EOC supports the City's Emergency Operations Organization to achieve its mission of saving lives, protecting property, and returning the City to normal operations in the event of a disaster. LADWP coordinates its efforts with the EOC and will utilize the EOC to resume water supply service after a catastrophic event.

Earthquakes

In the event of a major earthquake, LADWP has a Disaster Response Plan dedicated for the LAA in addition to its overall ERP. The Disaster Response Plan details procedures for operating the LAA following an earthquake in order to prevent further damage of the LAA. If the LAA is severed by seismic activity on the San Andreas fault and is temporarily unable to provide water to the City, LADWP will be able to use its water storage in Bouquet Reservoir to provide water supply to the City while repairs are made. In addition to this resource, if the California Aqueduct is intact south of the Neenach Pump Station (First Los Angeles Aqueduct – State Water Project Connection), arrangements may be made to transfer LAA water through this connection into the California Aqueduct for delivery to MWD. Arrangements can then be made to deliver water to the City through one of MWD's connections.

Power Outages

Most of LADWP's major pump stations have backup generators in the event a major power outage disrupts the primary energy system. Backup generators are either powered by a separate electric source or have independent diesel power. The diesel powered backup supplies are capable of running for at least 24 hours. In the event of a major power outage, all pump stations are designed to automatically switch to their backup generators to prevent disruption of water service. In addition, LADWP keeps an adequate storage supply which is able to keep the water distribution system operable until power is restored.

11.4.4 Mandatory Water Use Prohibitions – 10632 (a) (4)

Phase I prohibited uses of the Emergency Water Conservation Plan contains 13 wasteful water use practices that are permanently prohibited for all City of Los Angeles customers. Additional prohibited uses under other conservations phases can be found in section 11.4.1. These prohibited uses are intended to eliminate waste. During times of shortage, education and enforcement will be increased to enhance public awareness of the need to conserve water. The following are the 13 Phase 1 provisions:

1. No customer shall use a water hose to wash any paved surfaces including, but not limited to, sidewalks, walkways, driveways, and parking areas, except to alleviate immediate safety or sanitation hazards. This section shall not apply to LADWP approved water conserving spray cleaning devices. Use of water pressure devices for graffiti removal is exempt. A simple spray nozzle does not qualify as a water conserving spray cleaning device.

2. No customer shall use water to clean, fill, or maintain levels in decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes unless such water is part of a recirculating system.

3. No restaurant, hotel, cafe, cafeteria, or other public place where food is sold, served, or offered for sale shall serve drinking water to any person unless expressly requested.

4. No customer shall permit water to leak from any pipe or fixture on the customer's premises; failure or refusal to affect a timely repair of any leak of which the customer knows or has reason to know shall subject said customer to all penalties for a prohibited use of water.

5. No customer shall wash a vehicle with a hose if the hose does not have a self-closing water shut-off device or device attached to it, or otherwise to allow a hose to run continuously while washing a vehicle.

6. No customer shall irrigate during periods of rain and within 48 hours after a measureable rain event.

7. No customer shall water or irrigate lawn, landscape, or other vegetated areas between the hours of 9:00 a.m. and 4:00 p.m. During these hours, public and private golf courses greens and tees and professional sports fields may be irrigated in order to maintain play areas and accommodate event schedules. Supervised testing or repairing of irrigation systems is allowed anytime with proper signage.

8. All irrigating of landscape with potable water using spray head sprinklers and bubblers shall be limited to no more than ten minutes per watering day per station. All irrigating of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than fifteen minutes per cycle and up to two cycles per watering day per station. Exempt from these irrigation restrictions are irrigation systems using very low drip type irrigation when no emitter produces more than four gallons of water per hour and micro-sprinklers using less than fourteen gallons per hour.

9. No customer shall use in a manner that causes or allows excess or continuous flow or runoff onto an adjoining sidewalk, driveway, street, gutter, or ditch.

10. No installation of single pass cooling systems shall be permitted in buildings requesting new water service.

11. No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.

12. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each bathroom using clear and easily understood language. LADWP shall make suitable displays available.

13. No large landscape areas shall have irrigation systems without rain sensors that shut-off the irrigation systems. Large landscape areas with approved weather-based irrigation

controllers registered with LADWP are in compliance with this requirement.

11.4.5 Consumption Reduction Methods During Most Restrictive Stages – 10632 (a) (5)

Short-Term Actions

During a water shortage or emergency condition, LADWP utilizes its Emergency Water Conservation Plan (11.4.1) to decrease water use as needed based on the severity of the shortage. The Emergency Water Conservation Plan is capable of reducing water use in excess of 50 percent.

In addition, since 1993, LADWP's rate structure served as a basis to further reduce consumption. First tier water allotments were reduced during shortages by the degree of the shortage. For single-family residential users, the adjusted first tier allotments applied for the entire year. For other users, the adjusted first tier allotments applied only during the high season (June 1 through October 31). In July 2015, LADWP proposed a new rate structure to the Board of Water and Power Commissioners. The new rate structure sought to, among other objectives, further reinforce foundational water use efficiency. Following the proposal to the Board of Water and Power Commissioners, LADWP conducted extensive community outreach on the new rate structure at over 90 neighborhood council, community, business and civic meetings and webinars. Through the outreach campaign, LADWP shared more information on the proposed rate structure, which include:

- Budget Based Allocations;
- Seasonal rates;
- Four tiered rate for single-dwelling-unit residential customers;
- 100% volumetric pricing;
- Decoupled rates; and
- Revenue predictability.

On March 15, 2016, LA City Council approved the new rate structure. Details on the water rate structure are provided in Appendix C – Water Rate Ordinance.

To provide immediate demand reductions and increase public awareness of the need to conserve water, additional measures can be phased in as the dry period continues. Included among these measures are water conservation public service announcements (through television and/or radio), billboard ads, flyer distributions, and conservation workshops. LADWP also actively participates in public exhibits to disseminate water conservation information within its service area. Conservation is a permanent and long-term ethic adopted by the City to counter the potentially adverse impacts of water supply shortages.

State law further regulates distribution of water in extreme water shortage conditions. Section 350-354 of the California Water Code states that when a governing body of a distributor of a public water supply declares a water shortage emergency within its service area, water will be allocated to meet needs for domestic use, sanitation, fire protection, and other priorities. This will be done equitably and without discrimination between customers using water for the same purpose(s).

Long-Term Actions

LADWP's long-range water conservation program is driven by the need to continuously increase water use efficiency. This will reduce demand, extend supply, and therefore, provide greater reliability. Dry cycle experiences, public trust responsibilities, and regulatory mandates have raised the level of awareness within the City of Los Angeles of the need to approach demand reduction from a permanent and long-term perspective.

LADWP will continue to maintain and increase its existing conservation programs and pursue the development of new and innovative programs as outlined in Chapter 3, Water Conservation, and the Water Conservation Potential Study to meet the pLAn water demand target of 565,600 AFY by FY 2039/40. It should, however, be recognized that the ability to achieve water reduction during shortages by requesting additional voluntary measures is likely to be more difficult in the future. As customers adjust to a conservation ethic and adopt permanent measures to reduce water use, their water demands harden and become less susceptible to voluntary conservation.

11.4.6 Penalties for Excessive Use (Non-Compliance to Prohibited Use) – 10632 (a) (6)

The Emergency Water Conservation Plan sets penalties for violations of prohibited and unreasonable uses outlined in Sections 11.4.1 and 11.4.4. The specific penality for each violation is summarized in Exhibits 11L and 11M. The penalties vary by water meter size for Penalty Schedule A.

Exhibit 11L
Penalty Schedule A - Prohibited Use Violations

Water meter smaller than two (2") inches						
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**
1st Written Warning	$0	$0	$0	$0	$0	Board Authority
2nd Written Violation	$50	$100	$200	$300	$400	Board Authority
3rd Written Violation	$100	$200	$400	$600	$800	Board Authority
4th Written Violation	$150	$300	$600	$900	$1200	Board Authority

Water meter two (2") inches and larger						
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**
1st Written Warning	$0	$0	$0	$0	$0	Board Authority
2nd Written Violation	$100	$200	$400	$600	$800	Board Authority
3rd Written Violation	$200	$400	$800	$1200	$1600	Board Authority
4th Written Violation	$300	$600	$1200	$1800	$2400	Board Authority

Exhibit 11 M
Penalty Schedule B - Unreasonable Use Violations

Number of Consecutive Months with Violation	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Violation during months 1-5	N/A	$1,000	$2,000	$5,000	$10,000	Board Authority
Violation during months 6-11	N/A	$2,000	$4,000	$10,000	$20,000	Board Authority
Violation during months 12-17	N/A	$3,000	$6,000	$15,000	$30,000	Board Authority
Violation during months 18-23	N/A	$4,000	$8,000	$20,000	$40,000	Board Authority

11.4.7 Analysis and Effects on Revenues and Expenditures of Reduced Sales during Shortages – 10632 (a) (7)

The City's Water Rate Ordinance, adopted in June 1995, was last amended on March 15, 2016 to incorporate a new rate structure. The revised rate ordinance replaced the previous General Provision H with a decoupling component known as the Base Rate Revenue Target Adjustment (BRRTA). The BRRTA allows for LADWP to recover any shortage in revenue from base rates if sales decrease or credit back any excess collection if sales increase over the target. The BRRTA Factor is calculated once each year, separately for each schedule, and takes effect on January 1. The BRRTA eliminates the link between volume of sales and revenue collected, provides financial stability, and removes inherent barriers for conservation.

For more details on the water rate structure, please see Appendix C – Water Rate Ordinance.

11.4.8 Water Shortage Contingency Resolution or Ordinance – 10632 (a) (8)

A draft water shortage contingency declaration resolution is shown in Exhibit 11N.

Moreover, the City's Emergency Water Conservation Plan Section 121.07.B has the following conservation phase implementation procedures:

"The Department (LADWP) shall monitor and evaluate the projected supply and demand for water by its Customers monthly, and shall recommend to the Mayor and Council by concurrent written notice the extent of the conservation required by the Customers of the Department in order for the Department to prudently plan for and supply water to its Customers. The Mayor shall, in turn, independently evaluate such recommendation and notify the Council of the Mayor's determination as to the particular phase of water conservation, Phase I through Phase VI, that should be implemented. Thereafter, the Mayor may, with the concurrence of the Council, order that the appropriate phase of water conservation be implemented in accordance with the applicable provisions of this Article. Said order shall be made by public proclamation and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The prohibited water uses for each phase shall take effect with the first full billing period commencing on or after the effective date of the public proclamation by the Mayor. In the event the Mayor independently recommends to the Council a phase of conservation different from that recommended by the Department, the Mayor shall include detailed supporting data and the reasons for the independent recommendation in the notification to the Council of the Mayor's determination as to the appropriate phase of conservation to be implemented."

Exhibit 11N
Draft Water Shortage Contingency Declaration Resolution

BE IT RESOLVED that the Board of Water and Power Commissioners (Board) recognizes that a Water Shortage Contingency Plan has been prepared and incorporated into the City of Los Angeles 2015 Urban Water Management Plan pursuant to the Urban Water Management Planning Act; the Urban Water Management Plan is on file with the Secretary of the Board; this Board has reviewed and considered the information and recommendations contained in this document, and makes the following findings and determinations:

1. The water supply available to the City of Los Angeles is insufficient to meet the City's normal water supply needs; and
2. The Department of Water and Power has developed a Water Shortage Contingency Plan for the City of Los Angeles that compiles with all the requirements of the Urban Water Management Planning Act; and
3. The Urban Water Management Plan has been developed, adopted, and implemented pursuant to Article 3, Sections 10640 through 10645 of the Urban Water Management Planning Act; and
4. The Water Shortage Contingency Plan includes stages of action that can be taken in response to water supply shortages, including up to a 50 percent reduction in water supply, a driest three-year water supply scenario, mandatory water use prohibitions, and penalties for non-compliance; and
5. The Water Shortage Contingency Plan identifies both short-term and long-term actions to maximize water use efficiency and minimize the effects of the current water shortage as well as future water supply shortages.

BE IT FURTHER RESOLVED that this Board has adopted the Water Shortage Contingency Plan as incorporated in the Urban Water Management Plan, and declares the provisions of the Water Shortage Contingency Plan in full force and effect during the duration of this period of water shortage.

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of the resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held

11.4.9 Methodology to Determine Actual Water Use Reductions during Shortages – 10632 (a) (9)

Water use is monitored closely by LADWP throughout its service area regardless of the supply conditions. With 100 percent of its over 700,000 service connections metered, there is a high degree of accountability on the quantity of water used within the LADWP service area. Information from meter reads is collected for billing and accounting purposes, with reports prepared on a monthly basis from the data compiled. The actual water reductions are determined by comparing the metered water use to the normal water use under average weather condition when no mandatory water conservation is imposed. Based on these criteria, the water use level of FY 2006/07 was selected as the base year or the normal year to determine the effectiveness of water reduction measures during the recent water supply shortage.

11.5 Water Supply Assessments

Background

In 1994, the California Legislature enacted Water Code Section 10910 (Senate Bill 901), which requires cities and counties, as part of California Environmental Quality Act (CEQA) review, to request the applicable public water system to assess whether the system's projected water supplies were sufficient to meet a proposed development's anticipated water demand. The intent was to link the land use and water supply planning processes to ensure that developers and water supply agencies communicate early in the planning process. However, a study of projects approved by local planning agencies revealed that numerous projects were exempted due to loopholes in the statute, and that the intent of the legislation had largely gone unfulfilled.

Subsequently, California Senate Bill (SB) 610 and SB 221, modeled after SB 901, amended State law effective January 1, 2002, to ensure that the original intent of the legislation is fulfilled. SB 610 and 221 are companion measures which seek to promote more collaborative planning between local water suppliers and cities and counties. These bills improve the link between information on water supply availability and certain land use decisions made by cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. Both statutes also require this detailed information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. Both measures recognize local control and decision making regarding the availability of water for projects and the approval of projects.

Under SB 610, a water supply assessment (WSA) must be furnished to local governments for inclusion in any environmental documentation for specified types of development projects subject to CEQA. Specifically, SB 610 requires that for certain projects, the CEQA lead agency must identify a public water system that may supply water to the proposed project and request the public water system to determine the water demand associated with the project and whether such demand is included as part of the public water system's most recently adopted UWMP. If the projected water demand associated with the proposed project is accounted for in the most recently adopted UWMP, the public water system may incorporate the supporting information from the UWMP in preparing the elements of the assessment. If the proposed project's water demand is not accounted for in the most recently adopted UWMP, the WSA for the project shall include a discussion with regard to whether the public water system's total projected water supplies available in normal, single-dry, and multiple-dry water years during a 20-year projection will meet the proposed project's water demand.

Per Section 10912 of the California Water Code, a project which is subject to the requirements of SB 610 includes: (1) a proposed residential development of more than 500 dwelling units; (2) a proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; (3) a proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; (4) a proposed hotel or motel, or both, having more than 500 rooms; (5) a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; (6) a mixed-use project that includes one or more of the projects specified in this subdivision; or (7) a project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

The assessment would include an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts. If the assessment concludes that water supplies will be insufficient, plans for acquiring additional water supplies would need to be presented.

Under SB 221, approval by a city or county of new large development projects requires an affirmative written verification of sufficient water supply; which is a "fail safe" mechanism to ensure that collaboration on finding the needed water supplies to serve a new large development occurs before construction begins.

Methodology

Each WSA performed by LADWP is carefully evaluated within the context of the currently adopted UWMP and current conditions, such as restrictions on SWP pumping from the Sacramento-San Joaquin Delta imposed by a Federal court and drought conditions. MWD, from whom the City purchases its SWP and Colorado River water supplies, has also been actively developing plans and making efforts to provide additional water supply reliability for the entire Southern California region. LADWP coordinates closely with MWD to ensure implementation of MWD's water resource development plans and supplemental water reliability report prepared by MWD.

LADWP's UWMP uses a service area-wide method in developing City water demand projections. This methodology does not rely on individual development demands to determine area-wide growth. Rather, the growth in water use for the entire service area was considered in developing long-term water projections for the City to the year 2040. The driving factors for this growth are demographics, weather, and conservation. LADWP used anticipated growth in the various customer class sectors as provided by MWD who received projected demographic data from the Southern California Association of Governments (SCAG). The data used was based on SCAG's 2012 Regional Transportation Plan (RTP) Forecast.

As governed by City Charter Sections 673 and 677, LADWP can serve surplus water supplies to areas outside of the City boundary. LADWP's demand projections are based on its entire service area, which includes approximately 5,400 services for customers outside of the City. The combined annual water use of customers outside of the city is less than 1 percent of all water delivered. Water served outside of the City includes a surcharge to account for the increased MWD purchased water.

The water demand forecast model in the UWMP was developed using LADWP total water use, including the water served by LADWP for use outside of the City. The service area reliability assessment was performed for three hydrologic conditions: average year, single-dry year, and multiple-dry years; and a Shortage Contingency Plan was developed to provide for a sufficient and continuous supply in LADWP's service area. This

Shortage Contingency Plan included water provided for use outside of the City.

An important part of the water planning process is for LADWP to work collaboratively with MWD to ensure that anticipated water demands are incorporated into MWD's long-term water resources development plan and water supply allocation plan. The City's allotment of MWD water supplies under MWD's Water Supply Allocation Plan is based on the City's total water demand which includes services to areas outside the City. The ongoing collaboration between LADWP and MWD is critical in ensuring that the City's anticipated water demands are incorporated into the development of MWD's long-term Integrated Resources Plan (IRP). MWD's IRP directs a continuous regional effort to develop regional water resources involving all of MWD's member agencies. Successful implementation of MWD's IRP has resulted in reliable supplemental water supplies for the City from MWD.

In summary, the WSAs are performed to ensure that adequate water supplies would be available to meet the estimated water demands of the proposed developments during normal, single-dry, and multiple-dry water years, as well as existing and planned future uses of the City's water system. LADWP will continue to perform WSAs as part of its long-term water supply planning efforts for its service area.

WSA Procedure

The City of Los Angeles Department of City Planning (City Planning) is the CEQA lead agency for most projects within the LADWP service area, although other City departments or even the County of Los Angeles may perform this role. The CEQA lead agency must evaluate proposed projects against the requirements for a WSA, in accordance with the Water Code. If a proposed project falls within CEQA requirements for a WSA, the lead agency must submit a formal WSA request to LADWP.

Once a formal request is received, LADWP staff coordinates with the CEQA lead agency and project developer to clarify project scope and estimate project water demand. The existing water demand for uses to be removed on site, as well as proposed voluntary water conservation by the developer, are subtracted from the estimated gross proposed project demand to arrive at the net additional water demand. Existing, on-site water demand is typically established by historical billing records. WSAs include a discussion of the impacts of the annual net additional water demand of the project on the City's potable water supply. Elements of the water demand calculation are briefly described below.

Proposed Water Demand

Proposed water demand includes proposed indoor and outdoor water uses as well as cooling towers and/or parking. For indoor uses, base demand is first estimated by applying sewer generation factors (SGFs), published by City of Los Angeles Bureau of Sanitation, to elements of the project scope such as square footage and use type (restaurant, office, etc.). Because SGFs and water conservation codes and ordinances are updated at different times, current SGFs may not account for water savings from the most current ordinances. Required water savings are due to the Water Efficiency Requirements Ordinance No. 180822 and any other current City and State water conservation requirements. Much of the required water savings are achieved through high-efficiency plumbing fixtures. To account for water savings from codes and ordinances, required water savings is subtracted from indoor base demand to arrive at the indoor proposed water demand.

Water demand for outdoor uses is estimated per California Code of Regulations Title 23, Division 2, Chapter 2.7. Model Water Efficient Landscape Ordinance (MWELO). MWELO sets the maximum allotment through the Maximum Applied Water Allowance (MAWA). The proposed project water demand is known as the Estimated Total Water Use (ETWU) and is based on a formula using local environmental factors as well as project scope. LADWP establishes an outdoor base demand assuming no water conservation or restrictions are applied, and ordinance savings for irrigation are determined by subtracting MAWA from outdoor base demand. Similarly, voluntary conservation is determined by subtracting ETWU from MAWA.

Additional (Voluntary) Water Conservation

LADWP encourages developers to implement additional water conservation measures above and beyond the current water conservation ordinance requirements. Indoor voluntary measures might comprise inclusion of plumbing fixtures with flow rates below those required by current codes. As stated above, outdoor voluntary conservation is estimated by subtracting ETWU from MAWA. ETWU represents water needs for specific plant types while considering the efficiency of proposed irrigation systems. Developers may achieve outdoor additional conservation by proposing drought tolerant plants and efficient irrigation systems that bring ETWU below MAWA.

Additionally, if a proposed development is near an existing or planned, future recycled water pipeline system, commitment to use of recycled water for non-potable uses, such as irrigation, cooling towers, and toilet flushing, is highly recommended as part of the additional conservation measures for the proposed development, as long as City and County codes and ordinances are followed.

Basis for Approval

The basis for approving WSAs comes from the demographic projections by the Southern California Association of Governments (SCAG) and their link to the UWMP. The CEQA lead agency for proposed projects in LADWP's service area, in most cases City Planning, is responsible for determining if projects requiring discretionary actions conform to the use and intensity of development permitted by the City's General Plan or if it otherwise requires General Plan amendments, using the latest SCAG demographic projections. The General Plan framework establishes the "Policy" growth level as the basis for the planning of land use, transportation, infrastructure, and public services. CEQA lead agencies representing projects within the LADWP service area must ensure that a proposed development is consistent with the latest demographic growth projection by SCAG.

WSAs must include a discussion on whether projected water supply availability during a 20-year projection will meet a proposed development's water demand. SCAG utilizes a land use-based planning tool that allocates its projected demographic data into water service areas for MWD's member agencies, which was adopted for water demand projections in the UWMP. Because LADWP has performed an analysis of future City water demand based on SCAG population projections and has determined that adequate water supplies do exist out to 2040 to meet projected demand, developments that are consistent with the most recent SCAG projections have been captured in LADWP's demand forecast. This is the basis of approval for projects requiring WSAs.

All WSAs are subject to approval by the Board of Water and Power Commissioners. Upon approval, the CEQA lead agency is responsible for enforcing the requirements of the WSA.

11.6 Estimated Valuation of Water Supply Reliability

In 2012, LADWP participated in a study led by Los Angeles County Economic Development Corporation to estimate the economic impacts on Los Angeles County due to a major disruption of California Aqueduct. The study report titled "Total Regional Economic Losses from Water Supply Disruptions to the Los Angeles County Economy" was released on November 29, 2012 and updated on July 23, 2013. This study can be found at: http://laedc.org/wp-content/uploads/2012/11/FINAL-LA-Water_Report-7-23-2013.pdf.

This study estimated the total regional economic impacts of one major set of disruption scenarios stemming from a Bay Delta earthquake that would cause the closure of the California Aqueduct (State Water Project) for 6, 24, or 36 months. It also incorporated possible resilience, or tactics such as storage and diversion of replenishment water to reduce the impacts of a disruption. Moreover, water suppliers could adapt to the crisis by undertaking extra levels of conservation and recycling, and implementing technological innovations.

The partial conclusions of the study are highlighted below:

- The 6-month shutdown of the California Aqueduct in normal years relating to weather and hydrology conditions and reasonable levels of resilience, primarily conservation and production recapture, will result in no negative economic impacts.

- A24-month shutdown of the California Aqueduct could lead to a total two-year loss of 742,000 job-years of employment, $75 billion of gross domestic product (GDP), and $135 billion of sales revenue for businesses in LA County. Reasonable levels of several types of resilience could reduce this outcome significantly.

- Existing water storage is able to mute the potential impacts considerably. Maximum potential losses would be doubled for the 24-month and 36-month scenarios with zero storage, and even more in the cases of adverse hydrological conditions, such as extreme dry years.

- Resilience tactics other than water storage can reduce losses considerably if implemented close to their maximum potential. Under adverse hydrological conditions, however, even the full implementation of these tactics would still result in GDP losses in the tens of billions of dollars and employment losses in the tens of thousands of job-years.

Based on the LAEDC Study, it is reasonable to assume an economic benefit from the reliability associated with local water resources as compared to imported supplies. The economic value placed on the increased reliability associated with locally sourced supplies by MWD ranges from $340/AF to $475/AF based on the local project's life. This range of value was also used in the 2015 UWMP Update.

Chapter Twelve

Climate Change and Water and Energy Nexus

Eastern Sierra Nevada Mountains near Alabama Hills

12.0 Overview

LADWP is considering the impacts of climate change on its water resources as an integral part of its long-term water supply planning. Climate change is a global-scale concern, but is particularly important in the Western United States where potential impacts on water supplies can be significant for water agencies. Climate change can impact surface supplies from the Los Angeles Aqueduct (LAA), imported supplies from Metropolitan Water District (MWD), and local demands. As part of this impact analysis, LADWP completed a study to analyze the operational and water supply impacts of potential shifts in the timing and quantity of runoff along the LAA system due to climate change in the 21st Century. Such potential shifts may require LADWP to modify both the management of local water resources and LAA supplies. Projected changes in climate are expected to alter hydrologic patterns in the LAA's Eastern Sierra Nevada watershed through changes in precipitation, snowmelt, relative ratios of rain and snow, winter storm patterns, and evapotranspiration.

To understand some of the key issues surrounding climate change impacts, it is important to put it into the context of LADWP's water supplies. California lies within multiple climate zones. Therefore, each region will experience unique impacts due to climate change. Because LADWP relies on both local and imported water sources, it is necessary to consider the potential impacts climate change could have on the local watershed as well as the Western and Eastern Sierra Nevada watersheds. The Western Sierra Nevada is where a portion of MWD's imported water originates and the Eastern Sierra Nevada is where LAA supplies originate. It is also necessary to consider impacts in the Colorado River Basin where Colorado River Aqueduct supplies originate.

Generally speaking, any water supplies that are dependent on natural hydrology are vulnerable to climate change, especially if the water source originates from mountain snowpack. For LADWP, the most vulnerable water sources subject to climate change impacts are imported water supplies from MWD and the LAA. However, local sources can expect to see some changes in the future as well. In addition to water supply impacts, changes in local temperature and precipitation are expected to alter water demand patterns. However, there is still general uncertainty within the scientific community regarding the potential impacts of climate change within the City of Los Angeles. LADWP continues to monitor the latest developments in scientific knowledge and will continue to assess future research for the potential impacts of climate change on its water resources.

A widely held belief in the scientific community is that increases in concentrations of greenhouse gas (GHG) emissions in the atmosphere are a contributing factor to climate change. A substantial amount of energy and GHG emissions are associated with the production, conveyance, treatment, and distribution of water. LADWP has taken the initiative to study the nexus between water and energy consumption and to evaluate the associated carbon footprint of its water system. Department of Water Resources (DWR) strongly encourages urban water suppliers to voluntarily report energy intensity (energy consumed for every unit of water conveyed or processed) in their 2015 Urban Water Management Plan (UWMP).

12.1 Potential Impacts of Climate Change on Water Service Reliability

Scientists predict future climate change scenarios using highly complex computer global climate models (GCMs) to simulate climate systems. Although most of the scientific community agrees that climate change is occurring and, as a result, mean temperatures for the planet will increase, the specific degree of this temperature increase cannot be accurately predicted. Predictions of changes in precipitation are even more speculative, with some scenarios showing precipitation increasing in the future and others showing the opposite.

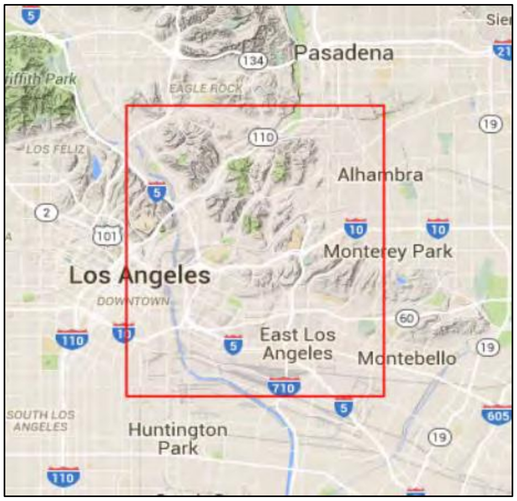
It is important to acknowledge that the predictions of the GCMs lack the desired precision due to the presence of uncertainties inherent in the analyses. The uncertainty relating to future emissions of GHG and the chaotic nature of the climate system leads to uncertainty in regard to the response of the global climate system to increases in GHGs. In addition, the science of climate change still lacks a complete understanding of regional manifestations resulting from global changes, thus restraining the projecting ability of these models. However, these models' projections are consistent with the state of science today, and they help predict the manner in which hydrologic variables are likely to respond to a range of possible future climate conditions, and thus they provide invaluable insight for water managers in their decisions pertaining to water supply reliability.

The regional areas of interest in assessing climate change impacts to LADWP include the local service area and sources of origination for imported water supplies in northern California, Eastern Sierra Nevada Mountains, and the Colorado River Basin. Data regarding climate change impacts for the various regions of interest are provided in this section.

12.1.1 Water Demand and Local Impacts

Climate change has the potential to impact the local climate and in turn alter projected water demands. Most scientific experts believe that because of the uncertainty involved with each climate change model, several models should be used to test the potential impact of climate change. To downsize the global coarse-scale climate projections to a regional level incorporating local weather and topography, the GCMs are "downscaled". Downscaled GCM data was obtained for the area indicated in Exhibit 12A by the red box. For the City of Los Angeles, future projections of precipitation and temperature were obtained for all available GCMs from the Lawrence Livermore National Laboratory through the World Climate Research Program's Coupled Model Intercomparison Project Phase 5 (CMIP5) dataset for representative concentration pathways (RCP).

Exhibit 12A Downscaled Global Climate Change Model Data Area for Los Angeles



Four levels of RCPs were adopted by the Intergovernmental Panel on Climate Change (IPCC) for the Fifth Assessment Report on climate change issued in 2014. Earlier versions of the Assessment Report the IPCC used emission scenarios. The four levels of RCPs, RCP2.6, RCP4.5, RCP6, and RCP8.5 refer to various levels of radiative forcing in the year 2100 in relation to pre-industrial values measured in watts per square meter (W/m2). Radiative forcing is the difference of sunlight absorbed by the Earth and the amount of energy reflected back into space. The following summarizes the RCPs:

- RCP2.6 – Greenhouse gas emissions peak between 2010 and 2020 and then decline, radiative forcing is 2.6 W/m2
- RCP4.5 – Greenhouse gas emissions peak around 2040 and then decline, radiative forcing is 4.5 W/m2
- RCP6 – Greenhouse gas emissions peak around 2080 and then decline, radiative forcing is 6 W/m2
- RCP8.5 – Greenhouse gas emissions rise throughout the 21st century, radiative forcing is 8.5 W/m2.

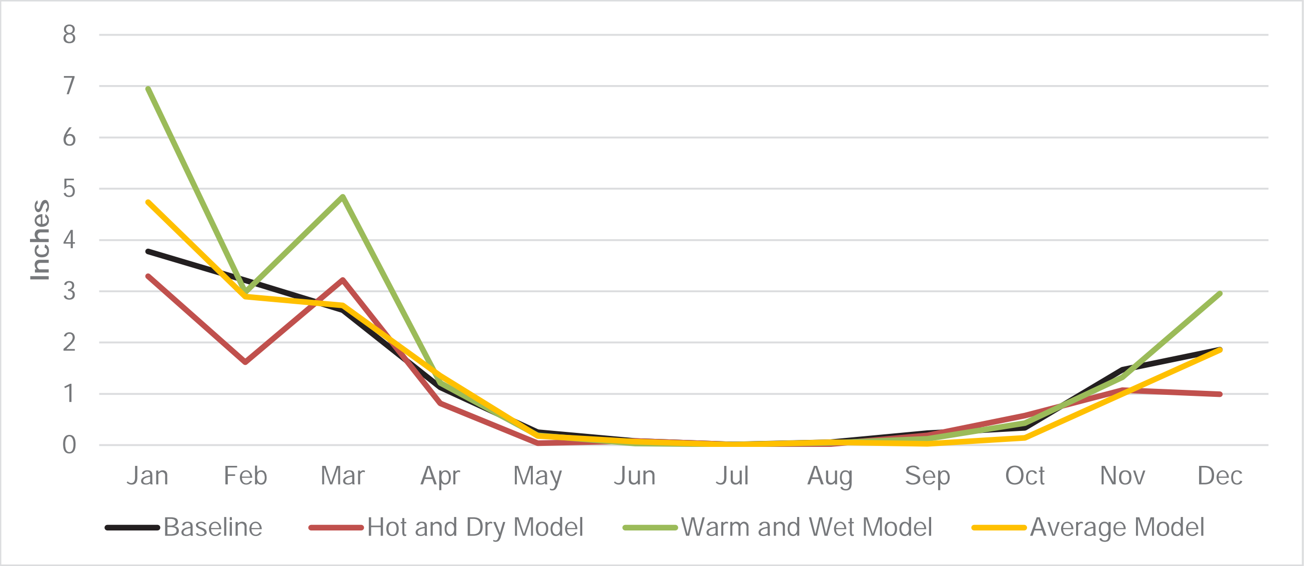
The CMIP5 dataset contains 34 GCMs of which three were selected for input into the demand forecast model to determine the range of uncertainty associated with future projections. The 34 GCMs were analyzed to determine three models representative of potential future climate change:

- Hot and Dry – Micro-ESM-Chem.1 for an RCP of 8.5, model developed by the Japan Agency for Marine Earth Science and Technology, Atmosphere and Ocean Research at the University of Tokyo, and the National Institute for Environmental Studies;
- Warm and Wet – GISS-E2.R.1 for an RCP of 4.5, model developed by the NASA Goddard Institute for Space Studies; and
- Average (or central tendency of all 34 models and RCP variations) – IPSL-CM5B-LR.1 for an RCP of 4.5, model developed by the Institute Pierre Simon Laplace.

The hot and dry and warm and wet models represent a high and low forecast under climatic change conditions and are used to determine impacts on Los Angeles' demands.

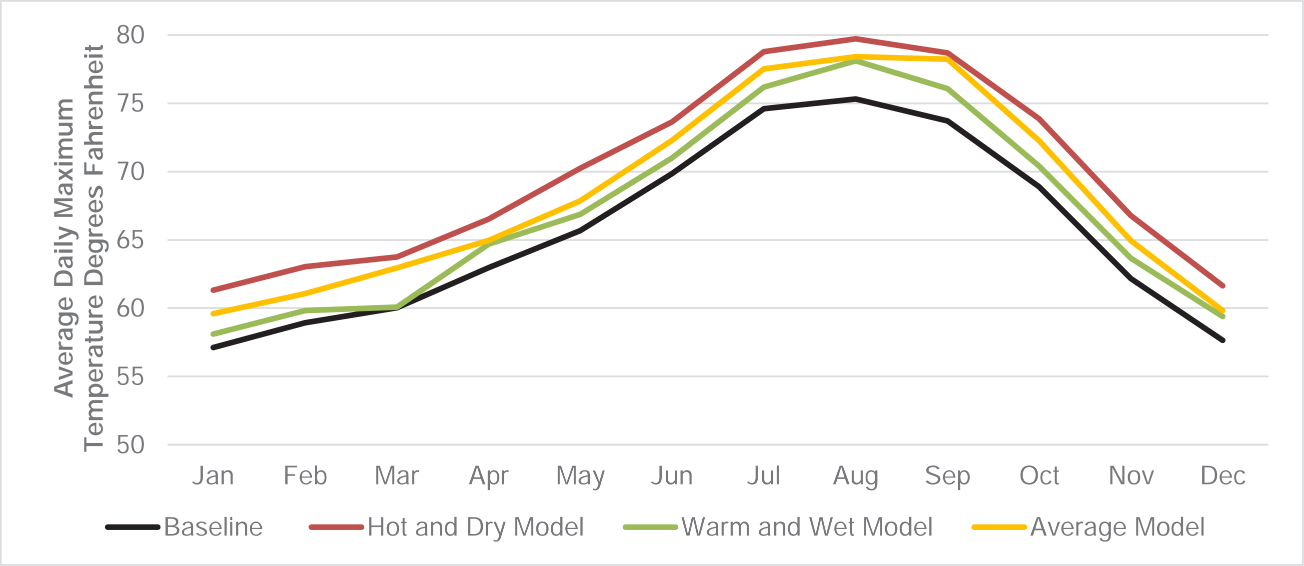
A comparison of average monthly precipitation projected for the three models for the period 2030 to 2050 and the historical long-term average of 1950 to 1999 are provided in Exhibit 12B. Average annual precipitation for the warm and wet model is projected to increase by approximately 6 inches over the baseline period. In contrast precipitation for the hot and dry model is expected to decrease by approximately 3.1 inches in relation to the baseline period. The average model projects annual precipitation will remain relatively unchanged in comparison to the baseline period. Overall, there is a 9-inch range between the hot and dry and wet and warm models. The increases and decreases in rainfall correspond to the rainy season illustrated by the baseline with little or no rain expected to occur during the dry season.

Exhibit 12B
Climate Change Impacts to Monthly Precipitation for GCM Models 2030 - 2050 vs. Baseline 1950-1999



A comparison of average daily maximum temperature for the three models for the period 2030 to 2050 and historical long-term average of 1950 to 1999 is provided in Exhibit 12C. The average daily maximum temperature for the hot and dry model is projected to increase over the baseline ranging from 3.57 to 4.99 °F, dependent on the month. The greatest increase is projected for September and the lowest increase for April. The warm and moist model has an increase range of 0.05 to 2.8°F over the baseline. Even the average model shows an increase ranging between 2.01 and 4.54°F.

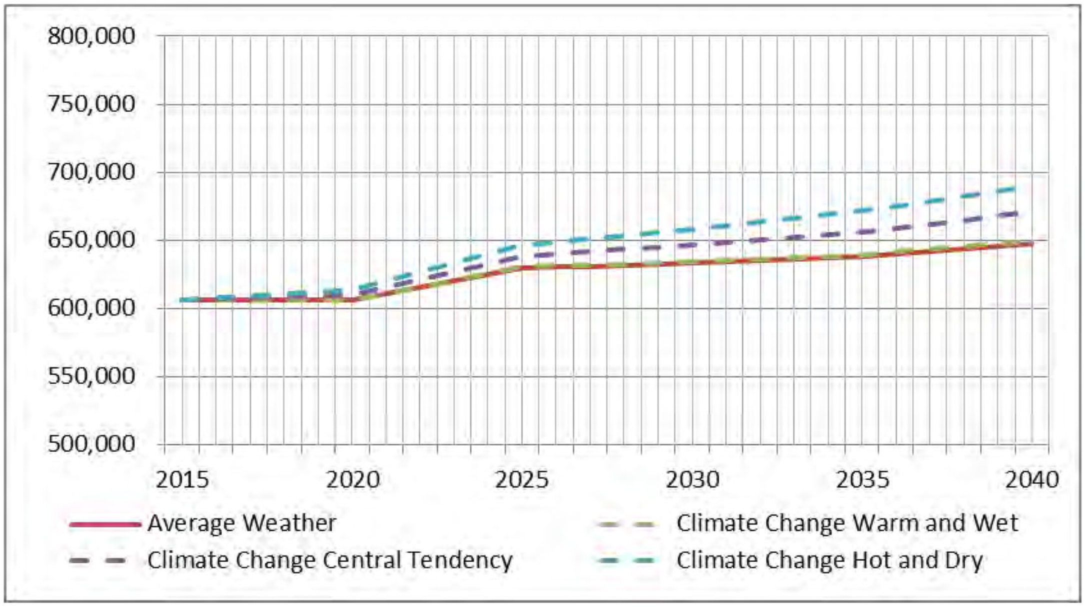
Exhibit 12C
Climate Change Impacts to Local Average Daily Maximum Temperature 2030 - 2050 vs. Baseline 1950-1999



Furthermore, detailed studies performed by the University of California, Los Angeles (UCLA) evaluated the potential impacts of climate change on the Los Angeles region and are generally consistent with the projected local climate changes from past reports. In December 2014, the Journal of Climate published a study by the Department of Atmospheric and Oceanic Sciences at UCLA titled Twenty-First-Century Precipitation Changes over the Los Angeles Region. The study concluded that the most likely projected outcome for the Los Angeles region in the 21st century is a small change in local mean precipitation compared to natural variability with large uncertainty in whether the change would mean an increase or decrease. A previous UCLA study, Mid-Century Warming in the Los Angeles Region, released in June 2012, found that by the mid-21st century, the most likely increase in warming over the Los Angeles region is roughly 4.6 ºF under "business-as-usual" emission levels. Under "mitigation emission levels," resulting from a scenario that assumes measures would be taken to reduce emissions, the most likely warming increase was projected to be somewhat smaller.

The impact of these climate effects will likely impact projected water demands. Exhibit 12D illustrates projected demands through 2040 under the current forecast (baseline) and the application of the three selected GCM models. Demands are shown with passive conservation for average weather without climate change, hot and dry climate change, warm and wet climate change, and the most representative central tendency of all 34 GCMs. Impacts vary by the GCM. In general the three climate change scenarios will result in an increase in demands over the current baseline forecast. The greatest increase in demands over the baseline in 2040 with passive conservation is associated with the hot and dry scenario resulting in an increase in demands of 42,900 AF (7 percent increase), followed by the central tendency scenario at 23,400 AF (4 percent increase), and the warm and wet scenario at 2,200 AF (less than one percent increase). Any additional demand due to climate change will result in a required increase in conservation to meet the mayor's targeted demand.

Exhibit 12D[1]
Baseline and Climate Change Scenarios with Passive Conservation



[1] Exhibit 12D was generated using the Demand Forecast Model

Additionally, in partnership with the Bureau of Reclamation and other local agencies, the Los Angeles County Flood Control District (LACFCD) has completed an ongoing three-year study, the Los Angeles Basin Study (LA Basin Study). The study evaluates the capacity of existing LACFCD flood control dams, reservoirs, spreading grounds, and other interrelated facilities to accommodate projected future climate and population changes in the Los Angeles Basin. The LACFCD works in partnership with LADWP on stormwater capture projects that help to recharge the groundwater basins and augment local supply. (see Chapter Seven, Watershed Management and Stormwater Capture). As part of the LA Basin Study, climate-adjusted precipitation and evaporation inputs were developed for use in their Watershed Management Modeling System (WMMS). Three sets of downscaled climate change projections from the World Climate Research Programme's Coupled Model Intercomparison Project Phase 3 (CMIP3) and Phase 5 (CMIP5) were selected and used in WMMS to model stormwater runoff, recharge and peak flood flows. In general, it was found that there would be little to no change in annual average precipitation for the region and this was also reflected in the stormwater runoff projections. The climate change projections and hydrologic modeling results were then used to analyze the response of the existing facilities and to assess the potential for changes in stormwater capture. It was found that there is a wide range of overall efficiency and resiliency within the existing system and that certain facilities are more readily adaptable to future changes than others. Next, a large list of potential concepts were developed and modeled to determine which opportunities could provide the largest future stormwater conservation benefit. Finally, the projects were evaluated in a trade-off analysis to identify which opportunities could benefit the region the most taking into consideration water conservation benefits and environmental, social, and economic measures. For the future opportunities highlighted in the LA Basin Study, implementing widespread, low-impact development, enhancing or constructing new centralized facilities, and improving policies could boost the region's existing stormwater capture potential. These concepts can help the region to adapt to the effects of climate change and improve the overall resiliency of the local water supply portfolio.

South Haiwee Reservoir Bypass Channel

12.1.2 Los Angeles Aqueduct Impacts

The LAA is one of the major imported water sources delivering a reliable water supply to the City of Los Angeles. The LAA originates approximately 340 miles away gathering snowmelt runoff in the Eastern Sierra Nevada; hence the LAA is subject to hydrologic variability which may be impacted by climate change. Since the majority of precipitation occurs during winter in the Eastern Sierra Nevada watershed, water is stored in natural reservoirs in the form of snowpack and is gradually released into streams that feed into the LAA during spring and summer. More detailed information regarding the LAA is presented in Chapter 5, Los Angeles Aqueduct Systems.

Eastern Sierra Nevada

Higher concentrations of GHG in the atmosphere are often indications of pending climate change. These changes threaten the hydrologic stability of the Eastern Sierra Nevada watershed through alterations in precipitation, snowmelt, relative ratios of rain and snow, winter storm patterns, and evapotranspiration, all of which have major potential impacts on the LAA water supply and deliveries.

To address the possible challenges posed by climate change on the LAA, LADWP completed a climate change study. The study, completed in 2011, evaluated the potential impacts of climate change on the Eastern Sierra Nevada watershed and on LAA water supply and deliveries. It also investigated opportunities to improve the LAA system in order to manage the potential impacts in the 21st century. In this study, future climate conditions are predicted using a set of sixteen GCMs and two GHG emission scenarios.

The study of the impacts of these climate change scenarios and the associated hydrology on the LAA's Eastern Sierra Nevada watershed includes an analysis of historical temperature, precipitation, water quality, and runoff records. Hydrologic modeling was performed to estimate runoff changes from current conditions and to determine the impact of these runoff changes on the performance of the LAA infrastructure with regard to storage and conveyance to Los Angeles. As part of the evaluation of potential adaptation measures for the case in which existing infrastructure would prove to be inadequate, recommendations were provided on how to modify the LAA infrastructure and operations to accommodate these impacts.

Results of the study show steady temperature increases throughout the 21st century and are consistent with other prior studies performed in the scientific community. Exhibit 12E displays the time series of 30-year running means of the projected temperature for the A2 GHG emission scenario (higher GHG emissions) averaged over the simulation area for each of the sixteen GCM models. All GCMs project temperature increases throughout the 21st century.

On the other hand, forecasts for precipitation differ widely among the GCMs. Some GCMs projected increases, but the majority of the model outputs projected decreases in precipitation over the study period. Exhibit 12F displays the time series of 30-year running means of the projected precipitation using the A2 GHG emission scenario (higher GHG emissions) averaged over the simulation area for each of the sixteen GCM models.

Exhibit 12E
30-Year Time Series Projected Temperature Means for Eastern Sierra Nevada Watershed

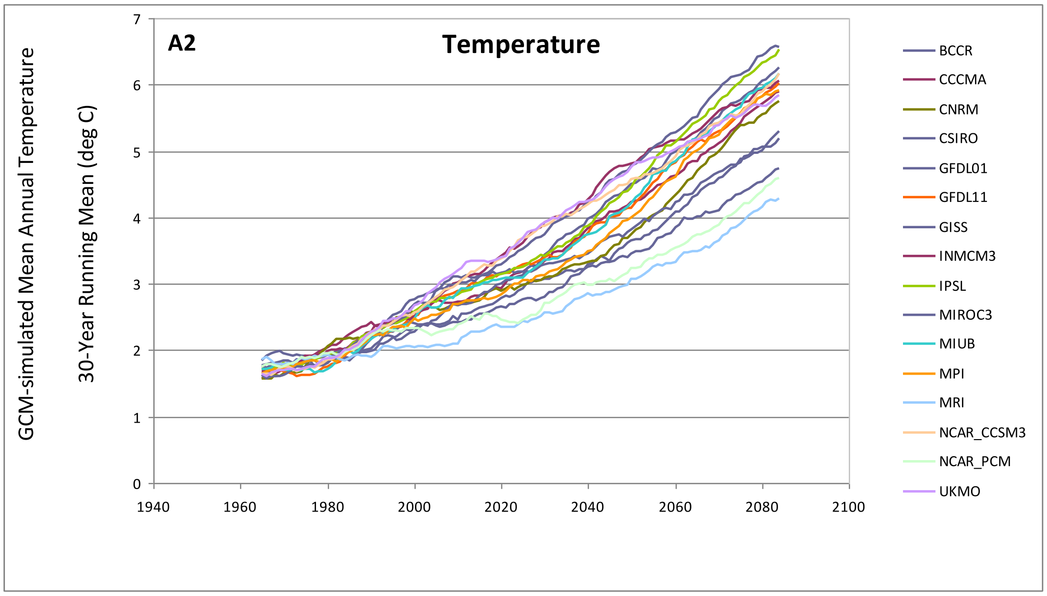
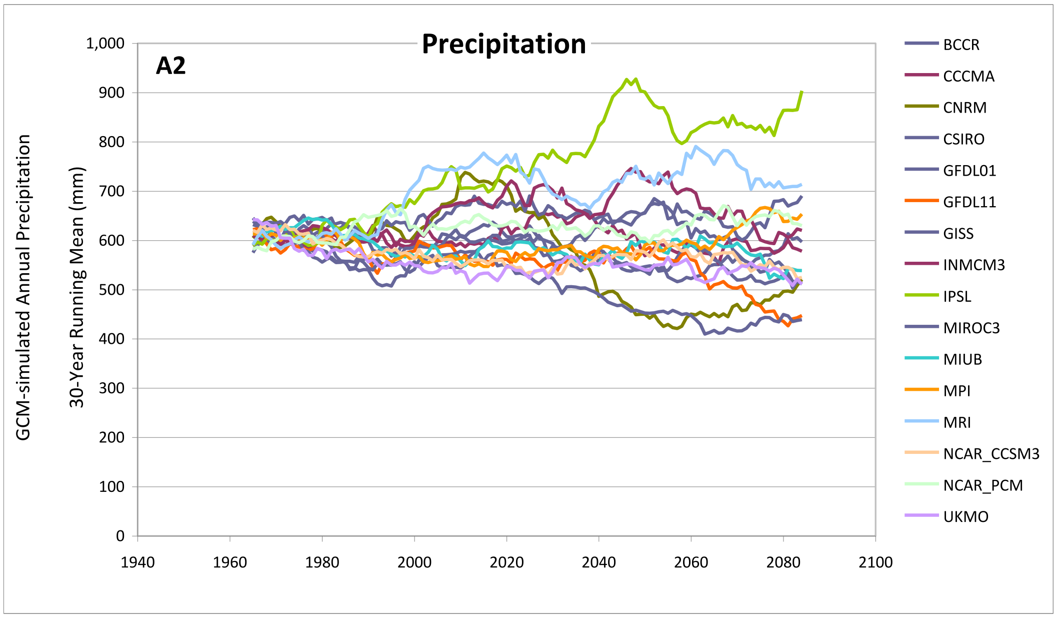


Exhibit 12F
30-Year Time Series Projected Precipitation Means for Eastern Sierra Nevada Watershed



Temperature is the main climate variable that is projected to rise significantly in the coming years and decades. The rise in temperature directly affects several variables including:

- Whether precipitation falls as snow or rain.
- The ground-level temperature that determines the timing and rate of snowmelt.
- The temperature profile in the canopy that determines the rate of evapotranspiration.

Predictions of the study for the early-21st century suggest a warming trend of 0.9 to 2.7 ˚F and almost no change in average precipitation. Mid-21st century projections suggest a warming trend of 3.6 to 5.4 ˚F and a small average decrease in precipitation of approximately five percent. This warming trend is expected to increase by the end of the 21st century, as the results indicate further warming of 4.5 to 8.1 ˚F and a decrease in precipitation of approximately ten percent. In addition, results indicate an increase in the frequency and length of droughts in the end-of-century period.

Projected changes in temperature (warmer winters) will change precipitation patterns from snowfall to rainfall with a larger percentage coming as rain than historically encountered. Consequently, peak Snow Water Equivalent (SWE) and runoff are projected to undergo a shift in timing to earlier dates.

With a long-term shift in mean temperature of 3.6˚F, snowpack of the Eastern Sierra Nevada at elevations of up to approximately 9,800 feet may be susceptible to earlier melt and less accumulation. On average, mean temperature rises are predicted to be in the range of 3.6 to 10.8 ˚F, resulting in a respective 17 to 50 percent loss in snowpack storage. This vulnerability would show up in average to warm winters and would directly affect stream levels and discharge. This raises potential operational concerns for LADWP regarding adequate storage, especially the capacity of the LAA system to store the earlier runoff in surface reservoirs.

The projected temperature and precipitation datasets form the basis of the hydrologic model projections for runoff, SWE, and rain-to-snow ratio. To compare the future projections of these variables, the trends that dominated the second half of the 20th century are considered baselines for future trends. The baseline values for runoff, SWE, and rain-to-snow ratio are 0.6 million acre-feet (MAF), 15 inches, and 0.2, respectively. By early 21st century (2010 – 2039), results indicate runoff is projected to undergo increases and decreases averaging between 0.5 and 0.85 MAF, the SWE is projected to undergo decreases and increases ranging between 10.6 and 19.0 inches, and the rain-to-snow ratio is projected to increase between 0.24 and 0.33. By mid-century (2040 – 2069), the same trends are expected to dominate, with runoff ranging between 0.34 and 0.9 MAF, the SWE ranging between 7.0 and 19.7 inches, and the rain-to-snow ratio increasing between 0.25 and 0.43. These trends are expected to govern until the end-of-century (2070 -2099) with runoff ranging between 0.35 and 1.1 MAF, the SWE ranging between 5.0 and 16.0 inches, and the rain-to-snow ratio increasing between 0.28 and 0.54. Exhibit 12G summarizes the projections for runoff, SWE, and rain-to-snow ratio for the 21st century.

Exhibit 12G
Projected Runoff, Snow-Water Equivalent, and Rain-to-Snow Ratio for Eastern Sierra Nevada Watershed

Timeframe	Runoff(MAF)	April 1 SWE (Inches)	Rain/Snow Ratio
Baseline (Second Half of 20th Century)	0.6	15.0	0.2
Early 21st-century (2010-2039)	0.5 - 0.85	10.6 - 19.0	0.24 - 0.33
Mid-century (2040-2069)	0.34 - 0.9	7.0 - 19.7	0.25 - 0.43
End-of-century (2070-2099)	0.35 – 1.1	5.0 - 16.0	0.28 - 0.54

Exhibit 12H
Projected Rain to Precipitation Ratio Based on Projected Precipitation and Temperature

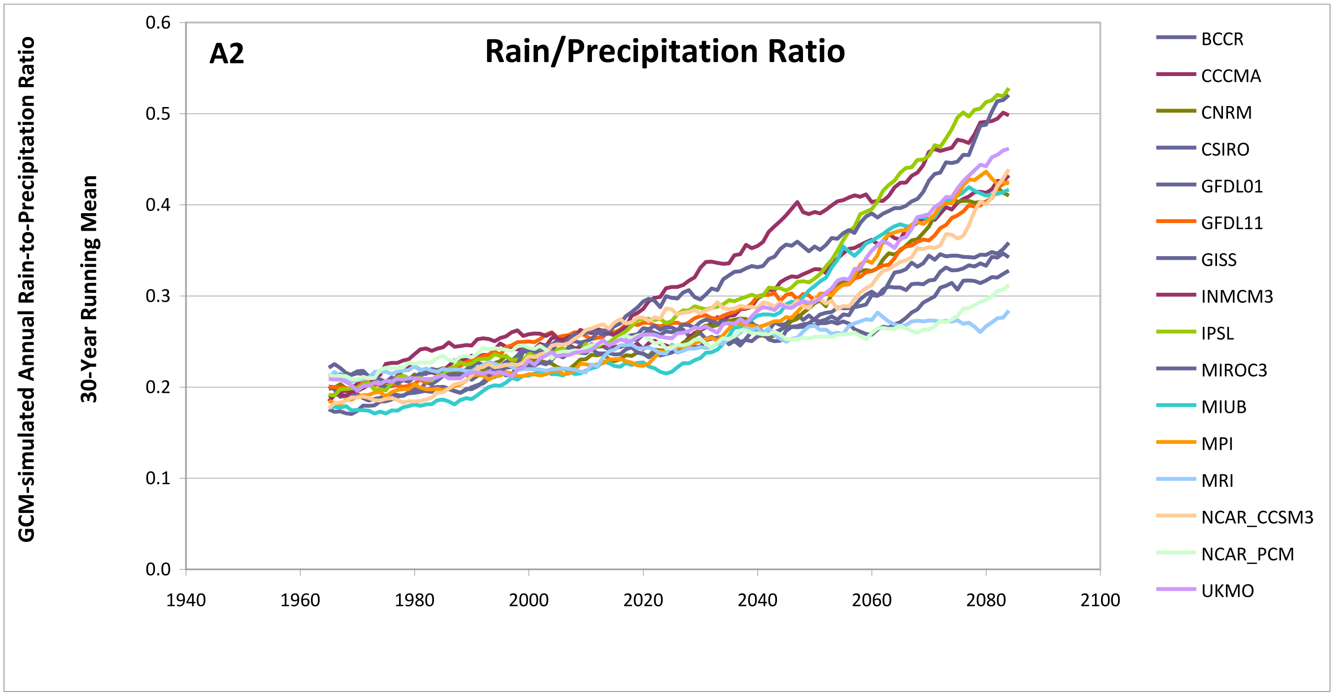


Exhibit 12H displays the rain-to-snow ratio based on the projected precipitation and temperature for the 16 GCMs. The rain-to-snow ratio is projected to increase throughout the 21st century, ranging between 0.24 and 0.33 by early 21st century, between 0.25 and 0.43 by mid-century, and between 0.28 and 0.54 by the end-of-century.

The increase of rain-to-snow ratio indicates the shift from snowfall to rainfall, specifically at low to moderate elevations, where the temperature tends to be warmer. This shift indicates more precipitation as liquid, and in turn, leads to loss of the snowpack. The snowpack is critical in providing seasonal storage by releasing winter precipitation in the spring and summer. The spring and summer snowmelt provides for increased soil moisture and stream flows needed to sustain both ecosystems and human populations.

To evaluate infrastructure capacity impacts, projected runoff for all 16 GCMs and two emission scenarios for the entire 21st century were run through the Los Angeles Aqueduct Simulation Model (LAASM) and analyzed for potential climate change impacts on the LAA system. The model incorporates the existing operational constraints in the LAA system, including maximum and minimum flows and storage capacities. As the hydrologic cycle over the 21st century is projected to become more variable, with years of higher than historical maximum runoff and other years with lower than historical minimum runoff, each of these two extremes could influence the infrastructure of the LAA and/or the ability of the LAA to deliver water to Los Angeles.

As part of the analysis, a hydraulic evaluation was performed on the entire main conveyance conduit of the LAA. Results of the runoff analysis on the existing infrastructure and operating rules, performed under projected 21st century hydrology, show that for a large fraction of periods simulated, the flows are within the range of historic flows observed in the LAA system. However, the study concluded that about seven percent of projected runoff is expected to be above, while ten percent of projected runoff is expected to be below, historical runoff ranges.

The hydraulic analysis results indicate that during projected wet years, when LAASM is able to allocate the flows in the system, the projected flows in LAA are not significantly higher than the current conduit capacities. However, in some instances, high monthly flows in the upper reaches of the watershed result in flows that are too high for LAASM to model given downstream flow constraints and existing storage limits in the Long Valley Reservoir, and the model fails to execute. These high runoff and flow conditions causing failure of the model would likely be handled through spreading in the upper reaches of the watershed. Under wet conditions, and when the model does execute, minimal to no impacts to the LAA main conveyance conduits due to the 21st century climate change are concluded, but there are concerns at the intake structures and reservoir outlet structures. Locations of concern include Lee Vining Intake Structure, Long Valley Reservoir, Pleasant Valley Reservoir Outlet, Tinemaha Reservoir Outlet, LAA Intake Canal, and North/South Haiwee Reservoir Complex Outflow. To the extent possible, preliminary analysis of overflow conditions were performed at these locations using available data on the structures. The preliminary analysis shows that the locations of concern could handle the projected high flows, although further detailed analyses of flow and sediment transport were recommended in order to fully quantify the impacts.

For dry conditions, there are a number of locations where the monthly flows are projected to be lower than historical flows and, in some cases, zero. These conditions do not result in an adverse impact from a hydraulic standpoint, although they are of concern from the perspective of water supply to the city.

Analysis of conveyance capacity of different sections of the two parallel portions of the LAA, the FLAA (First Los Angeles Aqueduct) and the SLAA (Second Los Angeles Aqueduct), showed that there are no obvious design bottlenecks where an infrastructure improvement would allow greater conveyance capacity in the system. Any modification to increase capacity would require a complete redesign of the entire aqueduct. Flows significantly higher than 800 cfs cannot be conveyed through the FLAA and SLAA.

Based on the findings above, eight different adaptation options were developed and analyzed (one of the eight options includes the baseline, status quo condition). To address the potential system impacts identified, the adaptation options involved an operational change and possible infrastructure changes to the LAA system (see Chapter Five for a description of the LAA system) that would maximize Flow to the City (FTC) under a range of conditions. The operational change included a modification of the current Long Valley Reservoir (Crowley Lake Reservoir) operating targets to handle larger peak inflows. The infrastructure changes considered included expansion of Long Valley Reservoir storage to handle larger inflows, expansion of three other downstream reservoirs (Tinemaha, North Haiwee, and Bouquet), and creation of new storage (surface water and groundwater) such that excess flows in wet years could be stored to supply water in extremely dry years. An additional infrastructure change considered included the supply of water from the State Water Project (SWP) at the Neenach Pumping Station in Antelope Valley to supplement low flow periods.

The goal of the adaptation analysis was to improve the delivery of water to Los Angeles, especially for low flow years and for the dry months of the year, while meeting all existing commitments for uses in the Owens Valley and Mono Basin in existence at the time of the study. Overall, the most significant findings of the analysis of the adaptation options are as follows:

- Increasing the volumes of the existing reservoirs does not improve FTC for the long term.

- New subsurface or surface storage down gradient of Owens Valley does not benefit FTC in the long term but is beneficial during dry years by capturing a fraction of run-off during wet years and storing it for use in dry years. The study concluded that groundwater storage appears to be more cost-effective option for meeting the proposed additional storage needs.

- Diverting water from SWP to LAA can produce a significant increase in FTC.

- A combination of all of the above alternatives also produces increases in FTC. However, this option is more costly than other alternatives due to construction requirements.

Hydrologic changes in the Eastern Sierra Nevada, as discussed above, can also impact water quality in the region. Water quality impacts were studied using a comprehensive watershed model, the Hydrologic Simulation Program-Fortran (HSPF) model, that simulates the hydrologic cycle, heat balance in stream reaches, and cycling of pollutants. Pollutants analyzed included total suspended solids (TSS), nutrients, organic carbon, biochemical oxygen demand (BOD), and metals. Six climate models of the 16 used for the over-all climate change study were used to make future projections of water quality impacts due to climate change for the period of 2010-2099. The six models selected for this assessment span a range of future outcomes, ranging from warm and wet to warm and dry climatic conditions.

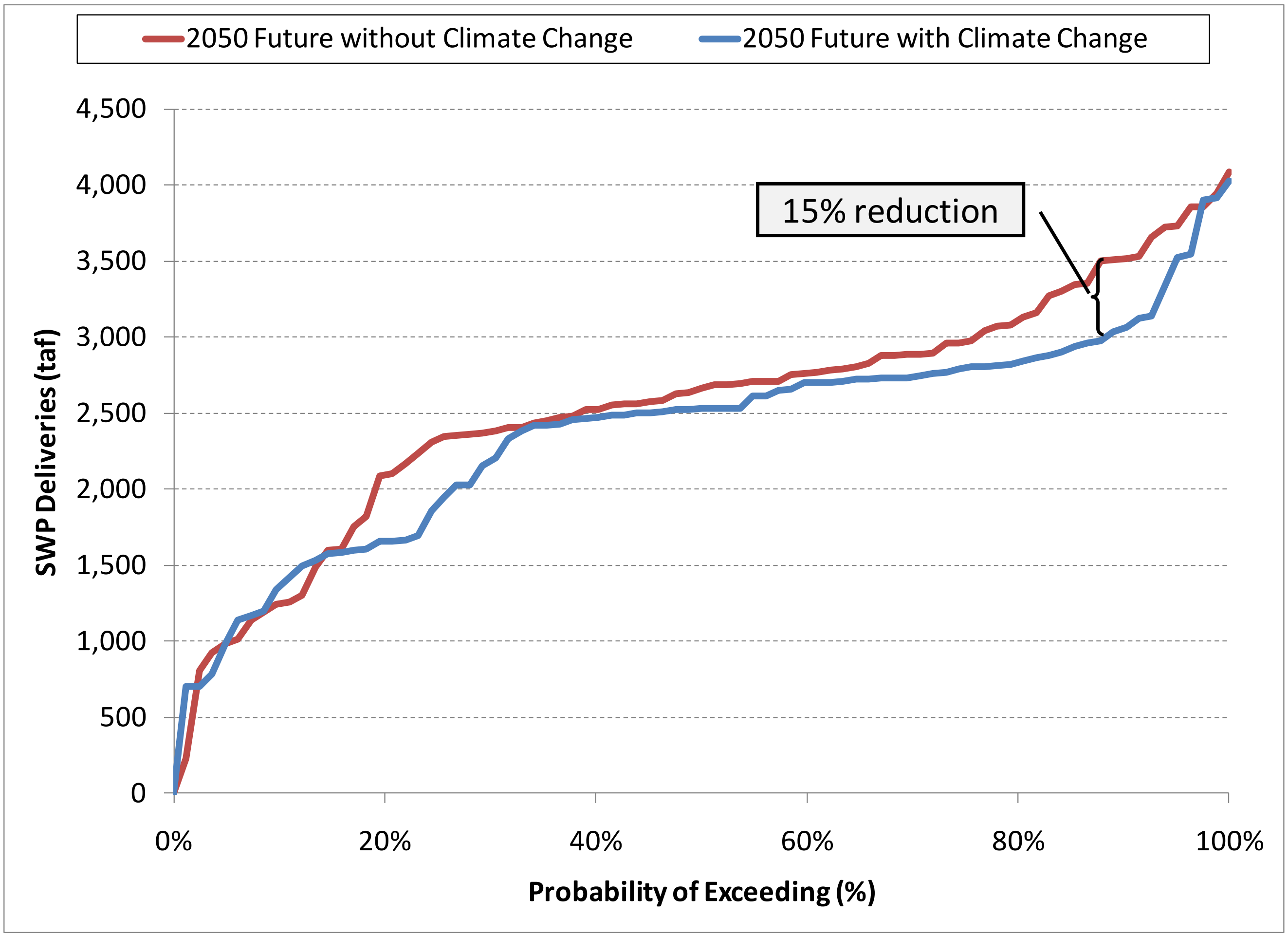
The HSPF model predicted changes in pollutant concentrations at different locations in the Eastern Sierra Nevada watershed. Although the predictions for some of the constituents considered were potentially adverse, their magnitude was too small to suggest significant negative consequences, in most cases. Using the best current information, this study supports continued monitoring of selected parameters to provide a foundation for evaluating long term trends, especially relationships of flows and contaminant concentrations. This is particularly true for TSS, nutrient, and arsenic concentrations. Such data can be used to improve the understanding of how concentrations vary with flows and can also be used to devise changes to operations should future predictions of water quality changes turn out to be significant and/or adverse.

Although many of the results above are quantitative in nature, it is important to account for the uncertainties inherent in these predictions. The results of this study will help guide water managers in planning and developing water supply and infrastructure to ensure the reliability and sustainability of adequate water supply and delivery well into the future.

12.1.3 State Water Project Impacts

To date, most studies on climate change impacts to California's water supply have been conducted for the Northern California region. In August 2010, DWR released the 2009 State Water Project Delivery Reliability Report, which specifically analyzes changes in volume of water available under various climate change scenarios. In the 2009 report, DWR projected that SWP deliveries could be reduced by as much as 15 percent in some cases, as illustrated in Exhibit 12I. In the more recent 2015 State Water Project Delivery Capability Report and in the previous 2011 and 2013 versions titled State Water Project Delivery Reliability Reports, the effects of climate change on SWP operations were incorporated into DWR's modeling, along with other factors related to water supply reliability. However, the reports did not provide a separate estimate for climate change impacts on SWP exports.

Exhibit 12I
Climate Change Impacts on SWP Delivery



To incorporate climate change into its reliability reports, DWR reviewed 6 GCMs for year 2050 projections using lower-emissions and higher-emissions scenarios contained in Using Future Climate Projections to Support Water Resources Decision Making in California (prepared in April 2009 by DWR). DWR selected the model most representing median effects on the SWP, which included a higher GHG scenario.

Climate change has the potential to disrupt SWP source supplies, impact conveyance, and alter storage levels in reservoir carryover storage. Annual Bay-Delta exports to areas south of the Bay-Delta are expected to decline seven percent for the lower-GHG-emissions scenario and ten percent for the higher-emissions scenario. However, it should be noted that for the six GCMs under the lower and higher emission scenarios, the range varies from a two percent increase to a 19 percent decrease, illustrating the variability in the various GCMs.

By 2050, median reservoir carryover storage is projected to decline by 15 percent for the lower-emissions scenario and 19 percent for the higher-emissions scenario, thereby reducing operational options if water shortages were to occur. Furthermore, by 2050, it is projected a water shortage worse than the 1977 drought could potentially occur in one out of every six to eight years, requiring acquisition of other supplies, reductions in water demands, or a combination thereof. An additional 575 to 850 TAF

Upper Colorado River Basin Dillon Reservoir

would be needed to maintain minimum SWP operational requirements and meet regulatory requirements. The main supply reservoirs on the SWP must maintain minimum water levels to allow water to pass through their lower release outlets in the dams. However, the April 2009 report does not consider the SWP vulnerable to a system interruption such as this under current conditions.

The primary effects of climate change on the SWP identified in the 2009 Reliability Report include, among others:

- More precipitation will fall as rain than snow.
- Reductions in Sierra snowpack.
- Sea level rise threatening the Bay-Delta levee system.
- Increased salinity in the Bay-Delta due to sea level rise requiring releases of freshwater from upstream reservoirs to maintain water quality standards.
- Shifted timing of snowmelt runoff into streams – spring runoff coming earlier resulting in increased winter flows and decreased spring flows.
- Increased flood events.

The most severe climate impacts in California are expected to occur in the Sierra watershed, where the SWP supply originates. Therefore, imported SWP water is extremely vulnerable to climate change.

More recent information about the nature of expected climate change in California is provided in California Water Plan Update 2013 (Update 2013). Released by DWR on October 30, 2014, Update 2013 is the State government's strategic plan for understanding, managing and developing water resources statewide. According to the report, higher temperatures are melting the Sierra snowpack earlier in the year and driving the snowline higher, resulting in less snowpack to store water for Californians and the environment. Droughts are likely to become more frequent and persistent in this century. Intense rainfall events are expected to continue to affect the state, possibly leading to more frequent and/or more extensive flooding. Storms and snowmelt may coincide and produce higher winter runoff, while accelerating sea level rise might produce higher surges during coastal storm events. Rising sea levels increase susceptibility to coastal flooding and increase salt water intrusion into coastal groundwater basins. Sea level rise will also place additional constraints on management and water exports from the Bay-Delta. Findings from these reports further illustrate the challenges of water purveyors on the state level in the face of a changing climate.

12.1.4 Colorado River Aqueduct Impacts

Climate change impacts to the Colorado River Basin (Basin) are comprehensively addressed by the US Bureau of Reclamation (USBR) in the Colorado River Basin Water Supply and Demand Study (Basin Study), completed in 2012, as one of four hydrologic supply projections incorporated into a scenario planning process. The climate change hydrology lowers average river flows throughout the Basin to below previously observed volumes and persists in compromising Basin reliability regardless of a wide range of demand and operational scenarios. Climate change projections from 2011 to 2060 are found to exhibit continued warming throughout the basin, shifting peak streamflow at many locations to May instead of June due to earlier snowmelt, and causing more precipitation to fall as rain instead of snow.

The Basin Study incorporates 112 bias-corrected, downscaled climate change projections derived from 3 emissions scenarios and 16 GCMs received from the Lawrence Livermore National Laboratory through the World Climate Research Program's (WCRP) Coupled Model Intercomparison Project Phase 3 (CMIP3; Maurer et al., 2007). The 112 climate projections are parsed into streamflow and evapotranspiration through the variable infiltration capacity (VIC) hydrologic model (Lohmann et al., 1996 and 1998). The resulting Colorado River Basin specific datasets are input to the Basin-wide Colorado River Simulation System (CRSS) model for long-term systems planning.

Several hydrologic indicators are used to help describe potential consequences of climate change on Colorado River Aqueduct (CRA) resources: Lees Ferry flow deficit indicates the decrease in flow from a regulated value of 75 maf over 10 years; Lake Powell pool elevation serves as an important water supply indicator; Lake Mead levels indicate whether a regulatory shortage should be declared for the Lower Basin; and the Lower Basin shortage parameter reflects shortage volumes that may be shared among the Lower Basin states and Mexico. Exhibit 12J below describes how these four indicators may influence Colorado River supplies to California.

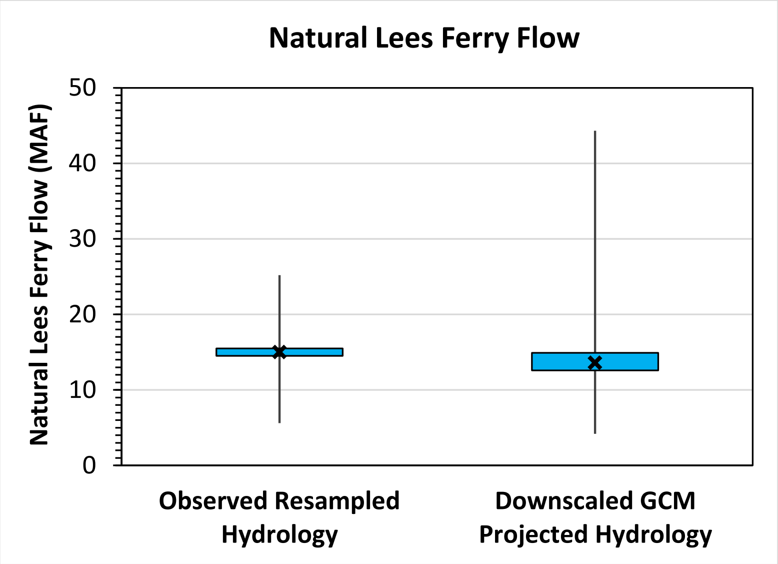
Exhibit 12J
Influence of Hydrologic Indicators on Colorado River Supplies

Hydrologic Indicator	Natural Lees Ferry Flow Deficit	Lake Powell Water Level	Lake Mead Water Level	Lower Basin Shortage
Potential Impacts	Summarizes natural hydrology of the area disregarding man-made impacts, a low value could imply, but does not substantiate, impending Lower Basin shortages.	Levels trigger balancing or equalization releases from Lake Powell to Lake Mead (USBR Record of Decision, 2007.) Additionally, could inhibit electricity generation if levels fall below the 3,490 feet, the minimum level for power generation.	Levels are increased by equalization releases from Lake Powell as well as natural inflows. Levels identified in the 2007 Guidelines (USBR, 2007) trigger Lower Basin shortages.	Includes both the regulatory shortages (declared by the Secretary of the Interior) and hydrologic shortage (low simulated natural supply) to the Lower Basin.

The Basin Study reports the temporal change of each hydrologic indicator for the climate change scenario paired with several demand simulations developed by the USBR in 2007, however, no demand scenario is able to deflect the drying trend imposed by climate change.

The natural flow of the Colorado River at Lees Ferry, Arizona is calculated as the flow that would occur without impacts from upstream depletions and reservoir regulation and provides an indication of natural basin hydrologic conditions. Exhibit 12K compares observed hydrology (which assumes current conditions into the future) and an ensemble of downscaled GCM scenarios. The vertical lines in the graphic show the minimum and maximum flow values, and as seen in Exhibit 12K the GCM ensemble (using 112 GCM models) indicates more variable flows in the future when compared to the observed hydrology. The thickness of the blue bars show the range of 25th to 75th percentile for flows, which again indicate that the GCM ensemble has more variability than observed hydrology. Finally, the "x" marks in the graphic indicate the median flow values. The median flow value for the GCM ensemble is 9 percent lower than the observed hydrology.

Exhibit 12K
Lees Ferry Flow



Supply surplus in the Colorado River basin is defined as at least two consecutive years with annual flow above the historic mean annual flow of 15 maf. Supply deficit is determined by at least two consecutive years of flow below the mean. Exhibit 12L demonstrates the frequency of surpluses and deficits that last for longer than 5 years, and notes the maximum length of surplus and deficit recorded for observed and climate change simulations.

Exhibit 12L indicates that the probability of a 5 year or longer deficit increases from 22 percent for observed conditions to 48 percent for climate change, while the probability of surplus decreases from 28 percent to below 1 percent for the same two hydrologic forecasts. The maximum deficit duration also increases between observed and downscaled GCM projections. Although the probability of surplus decreases, the maximum surplus length increases for climate change conditions, further contributing to climactic variability.

Fewer surplus flow years at Lees Ferry may lead to lower Lake Mead levels. The 2007 Interim Guidelines allocate shortage to Lower Basin delivery volumes based on Lake Mead levels, and forecasted trends may lead to greater shortage declarations due to the guidelines.

Under the 2007 Interim Guidelines, Lower Basin Colorado River deliveries are reduced to Arizona, Nevada, and Mexico, although no reductions in annual deliveries are assigned to California contractors. Drier future trends and increasing demands documented in Exhibit 12M (adapted from the Basin Study) lead to increasingly larger shortfalls in basin supply and may force regulators to change the distribution of Lower Basin delivery shortages.

Exhibit 12L
Deficit and Surplus Periods

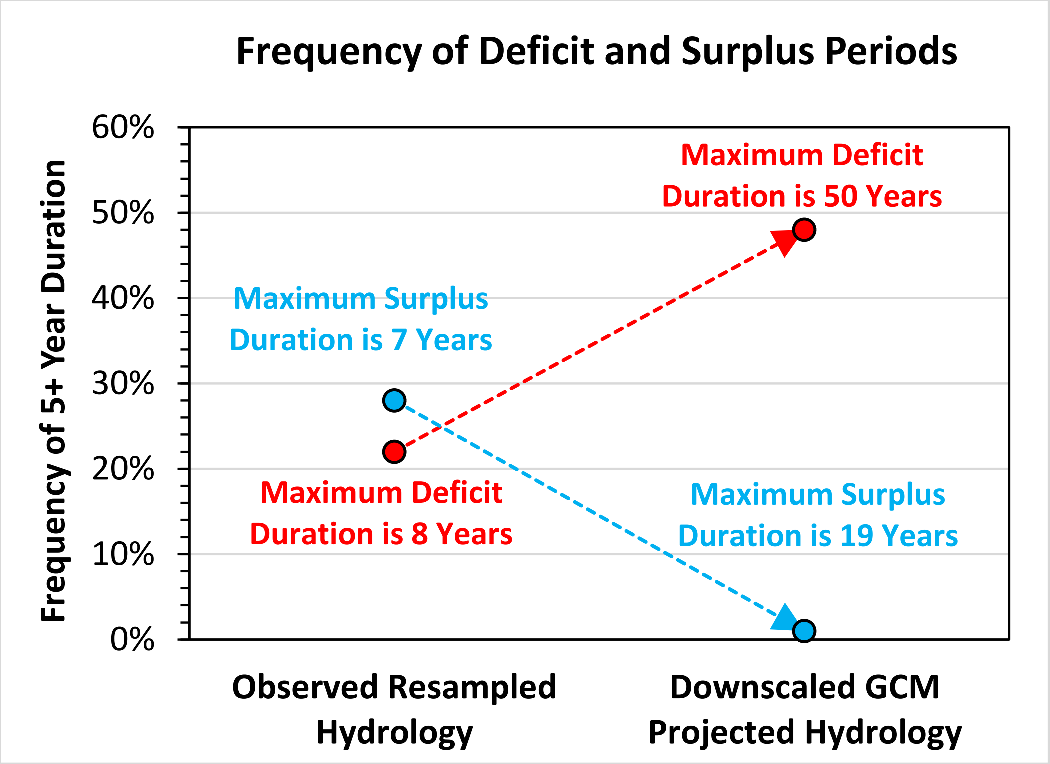
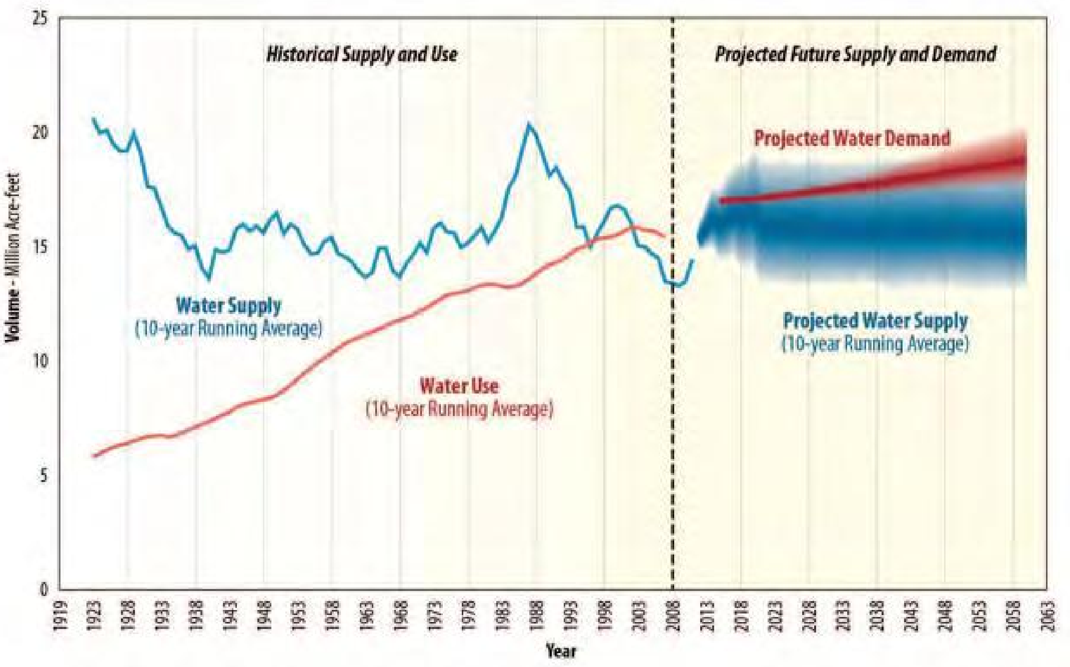


Exhibit 12M
Colorado River Basin Supply and Demand Gap



Despite the modeled results presented in the Basin Study, future shortages to California and the CRA are subject to unknown hydrology and regulations and are difficult to quantify. MWD has initiated endeavors to retain a full aqueduct including the Quantification Settlement Agreement approved in 2003 which contains wheeling and transfers with the Imperial Irrigation District (IID) and Coachella Valley Water District (CVWD), as well as a fallowing agreement with Palo Verde Irrigation District (PVID). MWD continues to investigate opportunities for fallowing and storage which may help to alleviate impacts of low deliveries to Lower Basin states.

12.2 Water and Energy Nexus

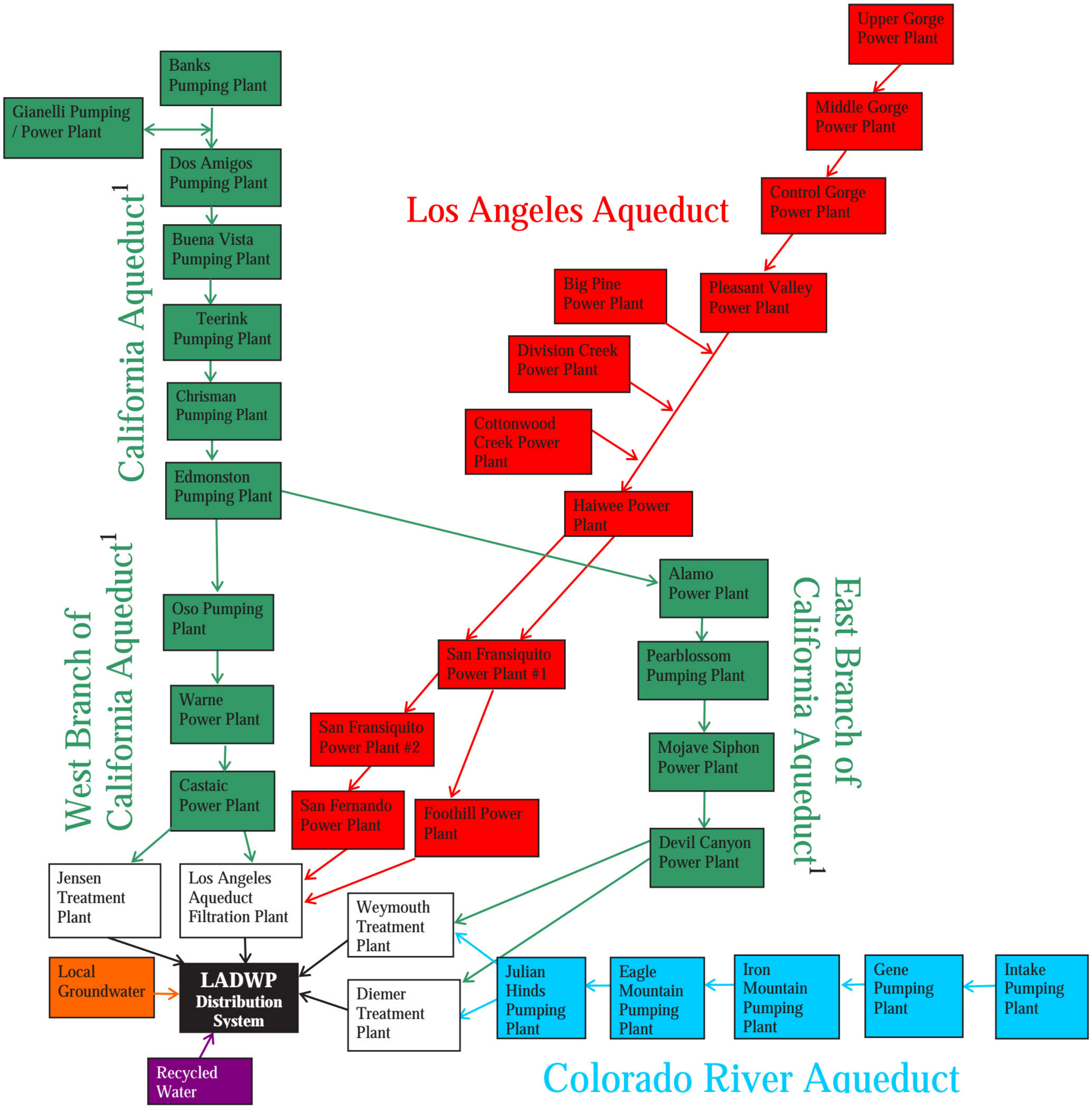
It is widely believed in the scientific community that the increase in concentrations of GHG in the atmosphere is a major contributing factor to climate change. As such, California is leading the way with laws that require reductions in GHG emissions and requirements to incorporate climate change impacts into long range water resources planning.

Carbon dioxide emissions into the atmosphere, and the emissions of other GHGs, are often associated with the burning of fossil fuels like crude oil and coal in the generation of energy. As a significant amount of energy is required for the movement of water over long distances and elevations, a link was subsequently realized between water supply conveyance and corresponding GHG emissions through its energy consumption. This link also applies to other steps in the water cycle, such as source extraction, treatment, and local distribution. The measure of GHG emissions, sometimes referred to as "carbon footprint" and expressed in units of tons (T) carbon dioxide (CO_2), can be estimated for water. Once the size of a carbon footprint is known, a strategy can be developed to better manage and reduce its impact on climate change.

DWR strongly encourages urban water suppliers to voluntarily report energy intensity (energy consumed for every unit of water conveyed or processed) of supply sources per Section §10631.2(a) of the California Water Code (CWC) and has provided voluntary draft reporting guidelines for the 2015 UWMP. Energy intensity reporting can be beneficial for water utilities because it identifies energy savings and GHG reduction opportunities for water conservation programs. This, in turn, provides funding opportunities for these programs.

To comply with CWC §10631.2(a), and to identify opportunities mentioned above, LADWP has taken the initiative to study the nexus between water and energy consumption and to evaluate the associated carbon footprint of its water system. The most energy intensive source of water for LADWP is water purchased from MWD, which imports SWP supplies via the California Aqueduct and Colorado River supplies via the CRA. LADWP also imports water via the LAA, which is a net producer of energy. Local sources of water for LADWP include groundwater and recycled water. Exhibit 12N outlines LADWP's water supply sources as well as the water system facilities that either consume or generate energy to extract, convey, and treat water for distribution throughout LADWP's service area. In the following sections, values for energy intensity or energy generation rate for each of LADWP's water supplies are discussed. The energy intensity or generation rates have been computed by dividing the total energy consumed or generated, respectively, by the total water conveyed or processed by that source. Both values are expressed in kilowatt hours per acre foot (kWh/AF).

Exhibit 12N
Sources and Facilities of LADWP's Water Supply Portfolio



1. Source: *Methodology for Analysis of the Energy Intensity of California's Water Systems*, p. 27.

12.2.1 State Water Project Supplies

Water supplied to Los Angeles via the SWP originates in Northern California and the Bay-Delta and is conveyed along the 444-mile long California Aqueduct to Southern California. Six pump stations are required to lift the water to the point at which the California Aqueduct splits into two branches. At the zenith of the California Aqueduct in the Tehachapi Mountains, approximately 3,846 kWh/AF are required to lift the water from the beginning of the aqueduct. After the water passes through Edmonston Pumping Plant, the California Aqueduct separates into two branches, the West Branch and the East Branch. Along the West Branch, the water is lifted once more at the Oso Pumping Plant and then energy is recovered through hydro-electric generation at the Warne and Castaic Power Plants. By the time the West Branch reaches its terminus at Lake Castaic, the net energy consumed in transporting each unit of water from the Bay-Delta is approximately 2,580 kWh/AF. Water supplied through the West Branch is provided to the San Fernando Valley, Western Los Angeles, and Central Los Angeles communities.

Along the East Branch, the water generates power at the Alamo Power Plant, is lifted once more at Pearblossom Pumping Plant, and is then used for generation at Mojave Siphon and Devil Canyon Power Plants. At the East Branch terminus at Lake Perris, approximately 3,236 kWh/AF of energy per unit has been expended in the transport. Water conveyed through the East Branch is provided to the Eastern Los Angeles and Harbor communities. The water supplied from the SWP is the most energy intensive source of water available to LADWP.

12.2.2 Colorado River Aqueduct Supplies

Water supplied from the Colorado River is imported via the 242-mile CRA operated by MWD. From the start of the CRA at Lake Havasu to its terminus at Lake Mathews, the water is lifted approximately 1,617 feet. Five pumping stations along the aqueduct lift the water to MWD's service area requiring approximately 2,000 kWh/AF. CRA water is the second most energy intensive water source for Los Angeles and is supplied to the Eastern Los Angeles and Harbor communities. Together, SWP water and CRA water comprise the total imports provided by MWD to LADWP. MWD imported water is the most expensive water source for LADWP in terms of both cost and energy.

12.2.3 Los Angeles Aqueduct Supplies

The LAA provides water from the Eastern Sierra Nevada watershed and is entirely gravity fed. As a result, no energy is required to import LAA water, making it the most desirable source of water in terms of energy intensity. There are twelve power generation facilities along the LAA system (upstream of the Los Angeles Aqueduct Filtration Plant). Of these twelve facilities, nine are "on-system," meaning these hydroelectric generation plants are on the main conduit of the aqueduct itself, whereas the other three are "off-system," or are located on the streams that feed into the aqueduct.

On average, the LAA generates approximately 4,736 kWh/AF from water directly used to generate power. This number was determined using the same methodology as was used to determine the energy intensity for the two branches of the SWP. The energy intensities for each individual generating facility were summed up to arrive at the total energy intensity for the water used to generate

San Francisquito Power Plant Number 1

power. However, when considered from the perspective of total amount of water delivered to Los Angeles via the LAA, the energy generated along the LAA is approximately 2,429 kWh/AF. The variance between the numbers can be attributed to the fact that not all water wheeled through the LAA is used to generate power and the fact that a portion of the water is introduced into the aqueduct system, at a point downstream of several of the power plants. The energy intensity of the LAA is not included in LADWP's total water system energy intensity, since the energy generated does not directly offset the energy required for other sources of water. However, in terms of supply, the LAA is able to offset the more energy intensive sources of water, consequently reducing the overall energy intensity of LADWP's water supplies. In dry years, and as LAA flows to Los Angeles are decreased due to environmental enhancement efforts in the Owens Valley and Mono Basin, LADWP is forced to rely more on energy intensive water purchased from MWD; local sources, such as local groundwater and recycled water, have remained relatively constant regardless of hydrologic variability. In low precipitation years, less LAA water supply is available, and LAA hydro-generation decreases. LADWP's purchase of energy intensive MWD water supplies is then needed, which raises the energy intensity of the over-all water supply. LAA has supplied approximately 31 percent of the water demand for Los Angeles, on average, from FYEs 2010 to 2015.

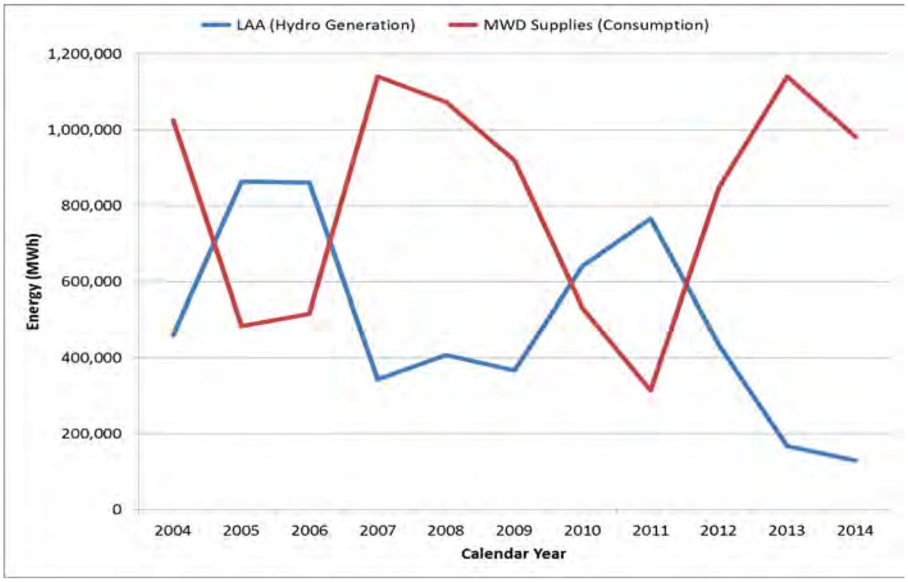
Exhibit 12O illustrates the variation between LAA hydro-generation and energy consumed to convey MWD purchased water to Los Angeles from CY 2004 to CY 2014. In CY 2005, LAA FTC (Flow to the City) was 376,394 AF, and LAA hydro-generation was approximately 863,500 MWh (Megawatt-hours). By contrast, in CY 2007, LAA FTC was 127,392 AF, and LAA hydro-generation was approximately 343,800 MWh. The decrease of approximately 519,700 MWh in hydro-generation between these years was equivalent to powering approximately 84,900 homes in Los Angeles for one year, and the associated quantity of CO_2

emissions to replace lost energy was approximately 293,600 mT, equivalent to adding approximately 57,600 passenger vehicles on the road for one year. The decrease in LAA FTC not only resulted in a loss of renewable energy and increased emissions associated with replacement energy, but also an increase in energy consumption and associated emissions with increased purchases of MWD water. The corresponding increase in MWD water purchased during the same period was 255,526 AF and resulted in an increase of approximately 655,500 MWh in conveyance energy, equivalent to powering approximately 107,100 homes for a year during that time. This increase in conveyance energy generated approximately 202,500 mT of CO_2 emissions, equivalent to adding approximately 39,700 cars on the road for a year. When considering the total impact from lost hydro-generation, increased emissions from replacement energy, and the energy and GHG due to increased MWD purchases, the net effect was an additional requirement of 1,175,200 MWh of energy and GHG emissions totaling 496,100 mT of CO_2.

On the other hand, between CY 2007 and CY 2011, there was an increase in LAA FTC resulting in approximately 421,500 MWh in LAA hydro-generation, equivalent to powering approximately 70,300 homes in Los Angeles for one year. The corresponding quantity of CO_2 emissions avoided was approximately 221,000 mT. Additionally, there was a related reduction in MWD purchased water of 319,872 AF, resulting in an approximate 826,300 MWh savings in conveyance energy and approximately 229,000 mT decrease in CO_2 emissions.

These examples show that hydrologic variability in the LAA watershed generally has a direct impact on the water system carbon footprint. Some exceptions are seen, however, as in CY 2014, when both LAA hydro-generation and MWD conveyance energy consumption decreased. During this dry year, both LAA and MWD purchased water supplies decreased from CY 2013 levels because of a decrease in total City water demand. This was mostly due to water conservation efforts. An increase in local groundwater production also helped the City reduce MWD water purchases. Efforts to reduce reliance on imported MWD water are expected to minimize negative environmental effects substantially, especially during dry periods.

Exhibit 120
Conveyance Energy for LADWP Imported Water Supplies



12.2.4 Local Groundwater Supplies

Groundwater accounts for approximately 13 percent of LADWP's water supply (FYE 2010 to FYE 2015). The over-all groundwater-well pumping energy intensity depends on various factors including groundwater level, effects of variable water quality on well-pump operations, and pump efficiencies. LADWP's groundwater supply has an average energy intensity of approximately 580 kWh/AF.

As LADWP continues with its cleanup of the contaminated water in the San Fernando Basin, groundwater will play an increasingly important role in Los Angeles' water supply portfolio. Although there is a potential for future increases in the energy required to process groundwater due to the introduction of new treatment technologies such as Advanced Oxidation Processes or others, groundwater is expected to remain a low energy source of water when compared to imported MWD purchases. Increasing groundwater production will allow LADWP to offset the energy intensive MWD sources and reduce its over-all energy intensity.

12.2.5 Recycled Water Supplies

Recycled water is currently the smallest component of LADWP's water supply portfolio, with municipal and industrial uses accounting for approximately two percent of total supplies for FYEs 2014 and 2015. Currently, LADWP receives recycled water directly from three wastewater treatment plants operated by the Bureau of Sanitation (LASAN), two of which provide recycled water treated to a tertiary level: Los Angeles Glendale Water Reclamation Plant (LAGWRP) and Donald C. Tillman Water Reclamation Plant (DCTWRP). Terminal Island Water Reclamation Plant (TIWRP) performs advanced treatment of recycled water in addition to tertiary treatment. LADWP also receives a small portion of recycled water directly from the West Basin Municipal Water District (WBMWD), which provides additional treatment of wastewater originating from Hyperion Water Reclamation Plant in El Segundo. Since all water at the plants directly supplying recycled water to LADWP is treated to at least a tertiary level regardless of disposal or reuse, the energy cost to treat the water to this level is considered a sunk cost because the water would be treated whether it offsets potable use or not. The advanced treatment process at TIWRP exceeds the requirements for discharge and is therefore not considered a sunk cost. The incremental energy associated with processing wastewater at TIWRP is approximately 2,318 kWh/AF. Since the treatment energy at the other two plants is not considered additional energy, only the pumping energy is included in the overall LADWP recycled water energy intensity. For LAGWRP, the pumping requires approximately 614 kWh/AF for LADWP customer supply, and for DCTWRP, the pumping requires approximately 467 kWh/AF. The energy intensity associated with the recycled water LADWP purchases from WBMWD is approximately 602 kWh/AF. A weighted average of these values gives recycled water an energy intensity of approximately 1,150 kWh/AF. Recycled water energy intensity depends on various factors including the amount of recycled water being pumped to a higher elevation, amount of advanced treated recycled water being used, extension of recycled water distribution system resulting in additional head loss, and pump efficiencies. In addition to the municipal and industrial recycled water that is considered in LADWP's total supplies, the plants produce significant additional volumes of recycled water that are beneficially used. Beneficial uses include the seawater barrier for the Dominquez Gap using recycled water from TIWRP, and the Japanese Garden and Los Angeles River using recycled water from DCTWRP.

12.2.6 Treatment Energy

Another factor in determining the energy intensity of LADWP's water supply is the energy required to treat water for potable purposes. All LAA water and nearly all West Branch SWP water supplies purchased by LADWP are treated at Los Angeles Aqueduct Filtration Plant (LAAFP). A small percentage (approximately five percent) of West Branch SWP water is treated at Jensen Treatment Plant, owned and operated by MWD and located in Sylmar, adjacent to LAAFP. The energy intensity of the Jensen Plant is approximately 42 kWh/AF. For LAAFP, the treatment energy intensity has averaged approximately 34 kWh/AF. However, in 2014, the Dr. Pankaj Parekh Ultraviolet (UV) Disinfection Facility was commissioned to add UV treatment to the LAAFP treatment processes. UV light treatment provides disinfection while minimizing harmful disinfection by-products thus aiding in achieving compliance with water quality regulations. The UV treatment process is expected to increase the over-all energy intensity for water treated at LAAFP by approximately seven kWh/AF. Other plant efficiency upgrades, however, are expected to offset this increase to some degree. A more precise estimate will be made when sufficient historic data become available.

East Branch SWP and CRA water supplies are primarily treated at both Weymouth Treatment Plant in the San Gabriel Valley, and Diemer Treatment Plant in Orange County. These treatment plants are owned and operated by MWD. The average energy intensity for Weymouth Treatment Plant is approximately 46 kWh/AF, and this plant supplies water to the East Los Angeles community. The average energy intensity for Diemer Treatment Plant is 20 kWh/AF, and this plant supplies water to the Harbor community. Historically, a ratio of approximately 55 percent SWP East Branch water and 45 percent CRA water has flowed through both of these MWD treatment plants. However, the proportions through each vary depending on the regional hydrology of the two sources (CRA and East Branch SWP) and the operational goals of MWD.

12.2.7 Distribution Energy

LADWP water distribution infrastructure, with 78 pump stations and 7,263 miles of distribution main, benefits from the topography of its service area in that much of the hydraulic head required for water distribution is provided by gravity. With the major sources of LADWP's water entering the service area at higher elevations than most other parts of the City, the energy required for distribution is lower than distribution energy for many other water distribution systems in Southern California. Distribution energy intensity is influenced by various factors including amount of water being pumped to a higher elevation, head loss in the pipe network, source water elevation, and pump efficiencies. The average energy intensity for LADWP's water distribution system is approximately 174 kWh/AF.

12.2.8 Summation of LADWP Water System Energy Intensity

Exhibit 12P shows the sum of the energy intensities for each of LADWP's individual water supply sources from FYEs 2010 to 2015; Exhibit 12Q shows a graphical representation of the total annual energy intensity for the same time period. An important detail is the influence that LAA water has on the total energy intensity for a given year. In wet years such as FYE 2011, which resulted in a large volume of LAA water, the total energy consumption for the LADWP water system is low, and the energy intensity is correspondingly low. Alternately, dry years with low volumes of LAA water result in high total energy consumption and energy intensity as a consequence of the need to import additional MWD supplies.

Exhibit 12P
LADWP Water System Energy Intensity for FYEs 2010-2015

		2010	2011	2012	2013	2014	2015
Los Angeles Aqueduct (0 kWh/AF)	Volume (AF)	199,739	307,692	266,634	113,411	61,024	53,546
	Treatment Energy Intensity (kWh/AF)[1]	34	34	34	34	34	34
State Water Project West Branch (2,580 kWh/AF)	Volume (AF)	195,536	105,452	157,745	327,326	362,335	301,631
	Treatment Energy Intensity (kWh/AF)[2]	34	34	34	34	34	34
State Water Project East Branch[4] (3,236 kWh/AF)	Volume (AF)	11,518	21,076	23,778	21,027	8,097	0
	Treatment Energy Intensity (kWh/AF)[3]	32	32	32	32	32	32
Colorado River Aqueduct[4] (2,000 kWh/AF)	Volume (AF)	53,720	39,924	28,914	40,107	71,554	60,975
	Treatment Energy Intensity (kWh/AF)[3]	32	32	32	32	32	32
Local Groundwater (580 kWh/AF)	Volume (AF)	76,982	49,354	61,060	58,811	79,403	87,046
Recycled Water[5] (1,150 kWh/AF)	Volume (AF)	6,703	7,894	6,850	7,513	10,054	10,437
Distribution (174 kWh/AF)	Volume (AF)	537,495	523,497	538,131	560,683	582,412	503,199
Spread, Spill and Storage Change (AF)[6]		-58	-1,082	751	-1,743	871	96
Total Volume Delivered (AF)		544,256	532,473	544,230	569,938	591,594	513,540
Total Estimated Energy Intensity (kWh/AF)[7]		1,490	1,063	1,275	2,024	2,161	2,072
Total Energy (MWh)		810,739	565,069	694,952	1,150,125	1,280,136	1,064,325

1. Los Angeles Aqueduct supplies are treated at Los Angeles Aqueduct Filtration Plant.

2. State Water Project West Branch supplies are treated at Los Angeles Aqueduct Filtration Plant and Jensen Treatment Plant, the latter of which is owned and operated by Metropolitan Water District of Southern California. The listed energy intensity is based on a weighted average of the energy intensities for the two plants.

3. Colorado River Aqueduct and State Water Project East Branch supplies are treated at Weymouth and Diemer Filtration Plants, owned and operated by Metropolitan Water District of Southern California. The listed energy intensity is based on a weighted average of the energy intensities for the two plants.

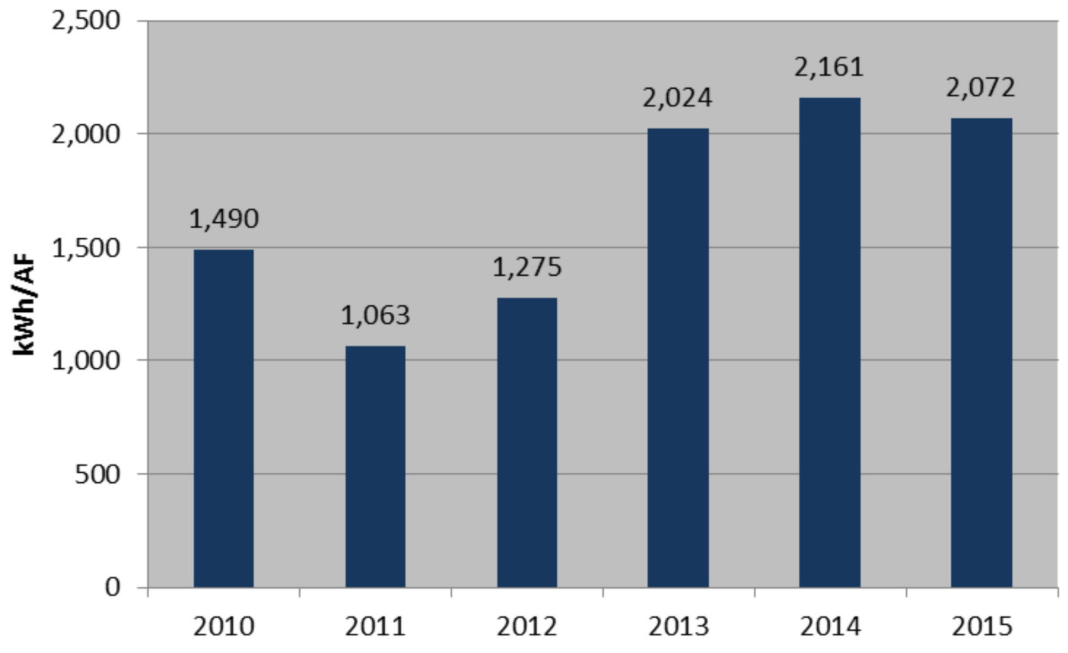
4. The quantities of SWP and CRA water delivered are based on the average ratio of effluent from the two sources at Weymouth and Diemer Treatment Plants, as reported in MWD annual water quality reports.

5. Recycled water volume is based on use for municipal and industrial uses, not on all beneficial uses. Energy intensity is a weighted average of energy used for pumping to customers and the incremental energy to treat from tertiary level to advanced and additional treatment levels.

6. The Spread, Spill and Storage Change category is not included in energy intensity or total energy calculations. Negative values indicate net volumes of potable water taken out of storage within the City or otherwise added to the Total Volume Delivered.

7. Total Estimated Energy Intensity is based on a flow-proportioned, weighted equation of energy intensities of individual supply sources.

Exhibit 12Q
LADWP Water System Annual Energy Intensity for FYEs 2010-2015



12.2.9 Carbon Footprint

All of LADWP's water supply sources have an associated carbon footprint related to the energy required to pump and/or process the water. Exhibit 12R provides the annual carbon footprint by water source. Exhibit 12S shows a graphical representation of the total annual carbon footprint for the same time period. For imported sources, the CYs 2007, 2010 and 2012 CAMX (Sub-region designated by the Western Electricity Coordinating Council) California average carbon emissions factors of 681.01, 610.82 and 650.31 lbs CO_2/MWh, respectively, were used to estimate the amount of carbon emissions produced per AF of imported MWD supply. For local sources, the LADWP Power System CO_2 metric was used to estimate the carbon emissions released in the production of this water. LAA is a net producer of energy and produces only green hydro-electric energy. No carbon emissions are associated with water imported through the LAA.

Exhibit 12R
Annual Footprint by Carbon Source for FYEs 2010-2015

		2010	2011	2012	2013	2014	2015
Los Angeles Aqueduct (0 kWh/AF)	Volume Delivered (AF)	199,739	307,692	266,634	113,411	61,024	53,546
	Carbon Footprint (tons C02)[1]	3,877	5,982	5,161	2,175	1,206	1,016
State Water Project West Branch (2,580 kWh/AF)	Volume Delivered (AF)	195,536	105,452	157,745	327,326	362,335	301,631
	Carbon Footprint (tons C02)[1,3,4]	166,692	85,125	131,343	280,821	311,069	258,718
State Water Project East Branch[2] (3,236 kWh/AF)	Volume Delivered (AF)	11,518	21,076	23,778	21,027	8,097	0
	Carbon Footprint (tons C02)[3]	12,157	21,037	24,501	22,345	8,604	0
Colorado River Aqueduct[2] (2,000 kWh/AF)	Volume Delivered (AF)	53,720	39,924	28,914	40,107	71,554	60,975
	Carbon Footprint (tons C02)[3]	35,257	24,779	18,526	26,502	47,282	40,291
Local Groundwater (580 kWh/AF)	Volume Delivered (AF)	76,982	49,354	61,060	58,811	79,403	87,046
	Carbon Footprint (tons C02)[1]	25,191	16,178	19,925	19,013	26,464	27,854
Recycled Water (1,150 kWh/AF)	Volume Delivered (AF)	6,703	7,894	6,850	7,513	10,054	10,437
	Carbon Footprint (tons C02)[1]	4,349	5,131	4,433	4,816	6,644	6,623
Distribution (174 kWh/AF)	Volume Delivered (AF)	537,495	523,497	538,131	560,683	582,412	503,199
	Carbon Footprint (tons C02)[1]	52,752	51,470	52,668	54,367	58,220	48,294
Spread, Spill and Storage Change (AF)[5]		-58	-1,082	751	-1,743	871	96
Total Volume Delivered (AF)		544,256	532,473	544,230	569,938	591,594	513,540
Total Carbon Footprint (tons CO_2)		300,274	209,703	256,557	410,040	459,489	382,797

1. Based on apportioning CY historical LADWP Power Generation CO_2 Emission factors.

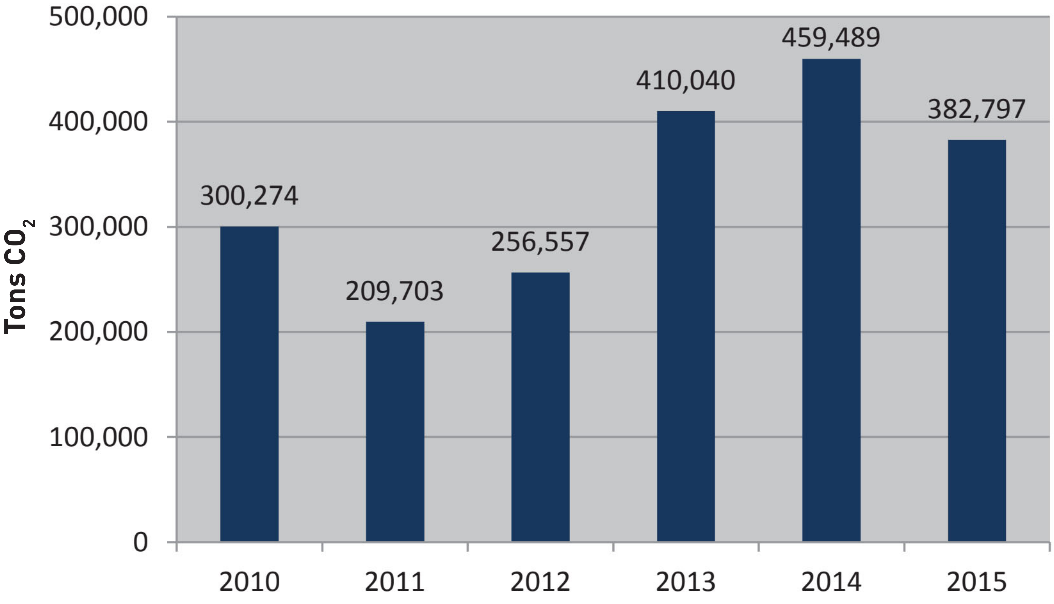
2. Amount of SWP water and CRA water delivered is based on an average of the proportions of the two sources delivered to MWD's Weymouth Treatment Plant and Diemer Treatment Plant over the time period.

3. Based on eGRID 2007, 2010 and 2012 CAMX (California Average) values for respective years.

4. State Water Project West Branch supplies are treated at Los Angeles Aqueduct Filtration Plant and Jensen Treatment Plant. The over-all carbon footprint due to treatment is based on a weighted average of the carbon emission factors for the two plants.

5. The Spread, Spill and Storage Change category is not included in carbon footprint calculations. Negative values indicate net volumes of potable water taken out of storage within the City or otherwise added to the Total Volume Delivered.

Exhibit 12S
Total Annual Carbon Footprint for Water Supply Portfolio FYEs 2010-2015



Reliance on energy intensive imported supplies from MWD increases the City's overall energy intensity and carbon footprint, such as during the current drought when limited LAA water has been available. Reductions in LAA flows due to environmental mitigation have the consequence of increasing Los Angeles' reliance on supplies imported through the SWP via the California Aqueduct, and Colorado River through the CRA.

12.3 Climate Change Adaption and Mitigation

Climate change strategies fall under two main categories: adaptation and mitigation. For water resources planning, a climate change adaptation strategy involves taking steps to effectively manage the impacts of climate change by making water demands more efficient and relying on supply sources that are less vulnerable to climate change. A mitigation strategy involves proactive measures that reduce GHG emissions, such as placing a stronger emphasis on using water resources requiring less GHG emissions. Both LADWP and its wholesale supplier for imported water, MWD, are implementing adaption and mitigation strategies as they become aware of potential climate change impacts.

It is imperative that supply options are carefully vetted and evaluated against both adaptation and mitigation goals, as they may conflict and work against each other. For example, desalination is a typical supply option that performs quite well in adapting to climate change impacts; however, due to the energy necessary to draw from and manage the supply source, it could result in higher GHG emissions if conventional energy sources are utilized.

12.3.1 LADWP Adaption and Mitigation

LADWP has outlined strategies to dramatically increase conservation and water recycling. Increasing conservation and water recycling encompasses both adaption and mitigation goals to address climate change. Additional adaption strategies under investigation by LADWP and the City include beneficial reuse of stormwater as discussed in Chapters Seven and Nine, Watershed Management and Stormwater Capture and Other Water Supplies, respectively.

Conservation has a double savings in terms of energy intensity because not only does it save energy in importing or producing the water, but it also saves energy through reduction of end use, such as heating water for a shower or for a dishwasher and wastewater treatment. The anticipated conservation savings will not only help to provide Los Angeles a secure and dependable water supply, but it will also reduce the energy footprint of the water supply, and consequently the carbon footprint. From FYEs 2008 to 2015, LADWP customers have saved approximately 716,204 AF. Without considering end-uses, this amount of conservation has displaced approximately 1.72 billion pounds of carbon dioxide emissions and an equivalent amount of energy to power approximately 379,070 homes for one year. A further discussion regarding conservation is provided in Chapter Three, Water Conservation.

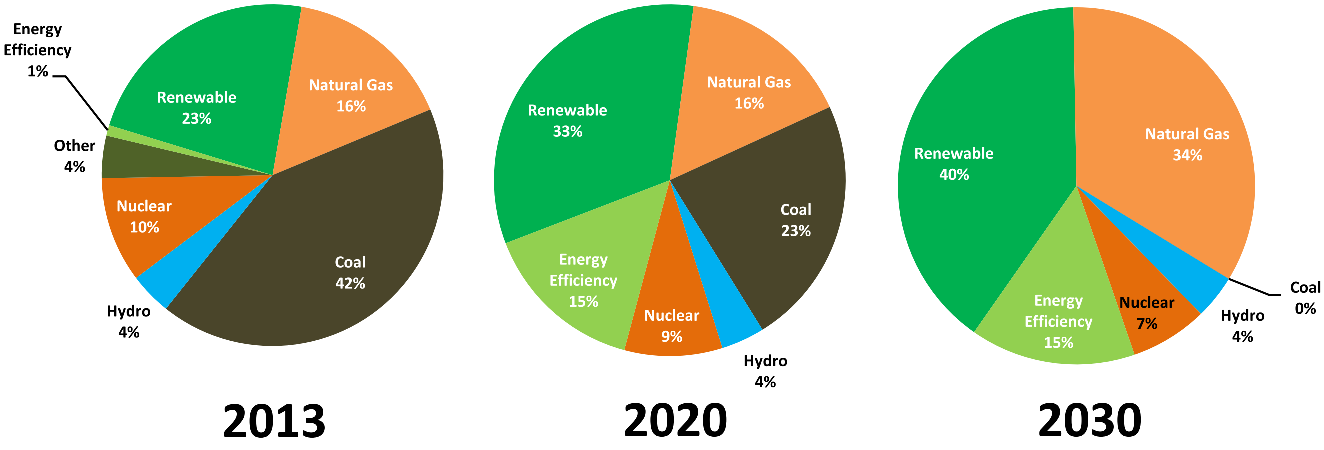
Recycled water use reduces reliance on potable water imported through MWD and provides a year round drought resistant water supply source. While the energy consumption requirements to produce recycled water are greater than local and LAA supply sources, recycled water assists LADWP in bolstering its supply portfolio to address potential supply changes related to climate change. A further discussion regarding recycled water is provided in Chapter 4, Recycled Water.

LADWP Power System resource planning efforts have also complemented Water System strategies to address climate change. To conform to the California Greenhouse Gas Emissions Performance Standard (SB 1368), LADWP is prevented from establishing new contracts, or renewing old contracts, for coal-fired generating stations, and it must comply by June, 2027. State law (SB 2(1x)) requires that California utilities meet the Renewable Portfolio Standard level of 33 percent renewable sources by 2020 and thereafter. Exhibit 12T shows a graphic representation of the historical and projected LADWP Power System supply sources, based on the 2014 Power System Integrated Resource Plan (IRP).

The Power System plans to meet and exceed the mandated goals. The Recommended Strategic Case (RSC) from the 2014 Power System IRP incorporates phasing out of the portion of coal-generated power that LADWP receives each year from Navajo Generating Station in Arizona, and Intermountain Power Plant in Utah, by 2016, and 2026, respectively. In addition, the RSC includes a goal to increase energy efficiency to at least 15 percent and renewable energy sources to 33 percent by 2020. Concurrently, the Power System is increasing the percentage of cleaner burning combined-cycle natural gas-generated energy in its power supply portfolio. This change to natural gas-generated power is intended to balance and complement environmentally dependent solar and wind energy production. Other sources, including nuclear and other purchases, will either be held constant or reduced as a percentage of the energy portfolio, or will be eliminated, by 2030.

Further, on October 7, 2015, California Governor Brown approved Senate Bill SB 350, known as the Clean Energy Pollution Reduction Act of 2015. This bill mandates an increase in the procurement of electricity from renewable sources from 33 percent to 50 percent by 2030 and beyond. The LADWP Power System will update its specific goals to meet

Exhibit 12T
Estimated LADWP Power Supply Portfolio for 2014 Power System IRP Recommended Strategic Case



this requirement in the next Power System IRP. These goals are expected to further and substantially decrease carbon emissions related to LADWP and Water System energy production and consumption, respectively.

Considering the integrated adaptation and mitigation efforts of LADWP's Water and Power Systems, goals established in Mayor Eric Garcetti's Executive Directive No.5 (ED5), and sustainability goals in mayor's Sustainable City pLAn (pLAn), carbon emissions for the Water System are expected to decrease despite an increasing population. These efforts involve minimizing water demand, shifting to less-energy intensive water sources, and reducing the carbon emissions of the energy produced by LADWP.

Looking back historically, Exhibits 12U and 12V represent the estimated historic total energy consumption and associated carbon emissions for the LADWP Water System, respectively, excluding LAA power generation offsets. Exhibit 12U shows the total energy consumption of LADWP's water system, including conveyance, treatment, and distribution of all water supply sources from FYE 1990 to FYE 2015. Each graph shows wide swings spanning a few to several multi-year periods over the 1990-2015 timeline. This is due mainly to variable hydrology and the fact that Water System energy and GHG profiles are highly dependent on LAA water deliveries which displace the need for highly energy intensive MWD supplies. Dry years bring less-abundant LAA supplies due to low precipitation in the Eastern Sierra Nevada Mountains. For those years with large volumes of imported MWD water, such as FYEs 2013 and 2014, the total energy consumption and associated GHG emissions were correspondingly high. Alternately, those years with low volumes of MWD supplies, such as FYEs 1996 and 2011, had low total energy consumption and associated carbon emissions as a result of the reduced energy requirements for imported MWD supplies.

A long-term observation from Exhibit 12U is an increasing trend in over-all energy consumption since the 1990s, represented by the ten year running average which for each year takes the average consumption of the preceding ten years. This trend is not attributable to an increase in water demand as might be assumed. In fact, City demand has not increased significantly over the time period because of aggressive conservation efforts, though it did fluctuate with variable hydrologic conditions and other factors. Understanding what has caused the increasing trend in energy consumption involves considering how supply sources have been affected by various factors over time. For example, it was mentioned that LAA supply is affected in the short-term by variable hydrology, but environmental commitments beginning in the early 1990s and increasing in later years have resulted in less available long-term water to supply the City. Prior to this time, MWD had historically made up a very low percentage of over-all supply, but by FYE 2015, it had increased by over 400 percent while LAA was reduced by nearly 40 percent, as a cumulative average since FYE 1981. There has also been a slight long-term reduction in run-off in the Owens Valley – part of the LAA watershed – since records were kept in 1935, potentially due to climate change. Long-term LAA reductions have had the largest impact on long-term energy consumption.

Since local sources have made up a comparatively small proportion of the supply portfolio, they have had a much smaller impact on long-term energy consumption. For example, the energy required to pump and treat GW is roughly one-sixth to one-third of that of MWD sources, depending on which MWD source is considered, so it has the potential to offset a significant amount of energy, but it has made up a much smaller percentage of total supply than MWD supply, ranging from about 11-13 percent in recent years. There have been reductions in this supply since the 1990's, but they have had much less impact than those for the MWD due to the lower percentage of over-all supply. Similarly, the energy required for RW is about double that of GW, but it has ranged from about one to two percent over most of the time period. The energy required for treatment and distribution of water has not significantly impacted the long-term trend in energy consumption from 1990 to 2015, as both have held relatively constant and comparatively small.

A comparison of Exhibit 12U to 12V illustrates that carbon emissions fluctuations for the Water System have generally mirrored fluctuations in energy consumption. This is because carbon emission rates do not change as dramatically as the Water System energy consumption rates that vary with a dynamic supply portfolio. The same mirroring applies to the ten-year running average trends, although there has been some divergence over the period shown. Carbon emission rates have generally declined in California due to Federal and State legislation that has set goals for reduction over the last decade or so. The result has been a dampening of the direct relationship between energy consumption and carbon emissions, as the rate for the latter has dropped slightly faster than that of the former. For example, the ten-year running average for energy consumption increased by approximately 139 percent from FYE 1990 to FYE 2015, whereas the ten-year running average for the GHG profile increased by approximately 94 percent in the same historic period. This dampening is expected to be more pronounced in the future as progressively robust clean energy goals are reached.

Exhibit 12W shows projections for both energy consumption and carbon emissions for the Water System from FYE 2020 to FYE 2040. Although the population is expected to increase by approximately ten percent over this period, the carbon footprint is expected to decrease. This is due to a combination of factors, some already alluded to above. The energy profile is expected to increase by approximately 26 percent from FYE 2020 to FYE 2040, whereas the GHG profile is expected to decrease by approximately 3 percent in the same time period.

The graphical behavior of the projections is accounted for by development of local supply projects, increased conservation, development of renewable energy sources, and, consequently, reduced reliance on MWD supplies. The results show that over the time period, projections for energy consumption and carbon emissions begin to diverge in FYE 2020, and the gap widens until about FYE 2030 and remains approximately steady until about FYE 2040, as they again mirror each other for the last ten years.

With MWD sources remaining relatively constant between FYEs 2020 and 2040 (assuming average hydrologic conditions) and conservation remaining steady as a percentage of total model water demand, local supply energy requirements will be the primary contributing factor for the increase in energy consumption observed in Exhibit 12W. Energy consumption rates for local supplies will increase due to additional advanced treatment processes to be commissioned in approximately FYE 2024, and steady increases in energy consumed for RW will result from continued expansion of tertiary level treated RW projects. Since RW has the highest energy intensity of all local sources, and because RW supply will increase the most as a fraction of local supply between FYEs 2020 and 2040, RW development will be a significant factor for total energy consumed for local sources.

Exhibit 12U
LADWP Historic Water System Energy Profile

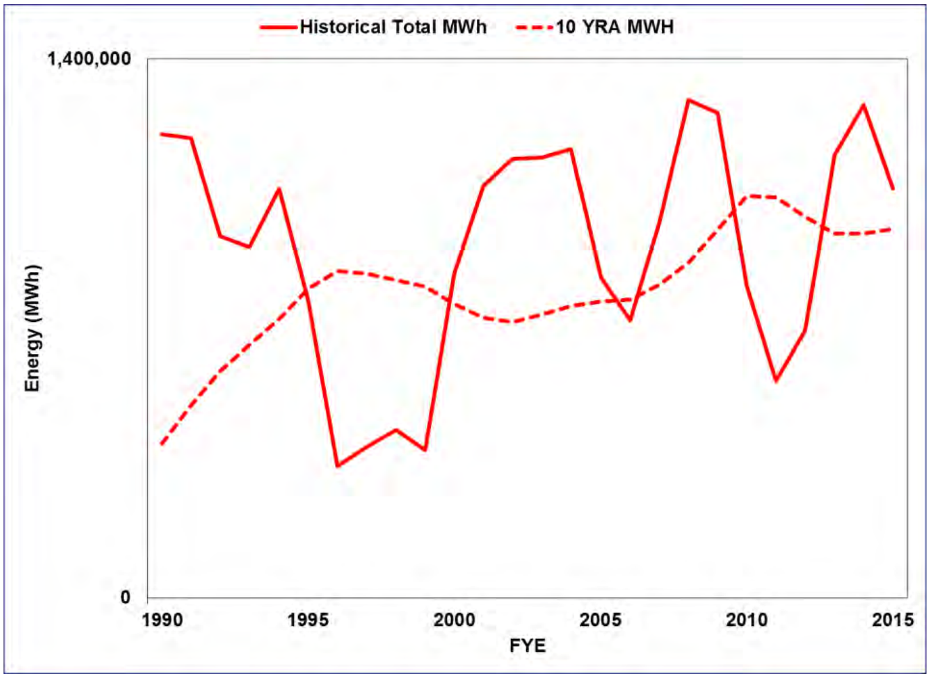


Exhibit 12V
LADWP Historic Water System GHG Profile

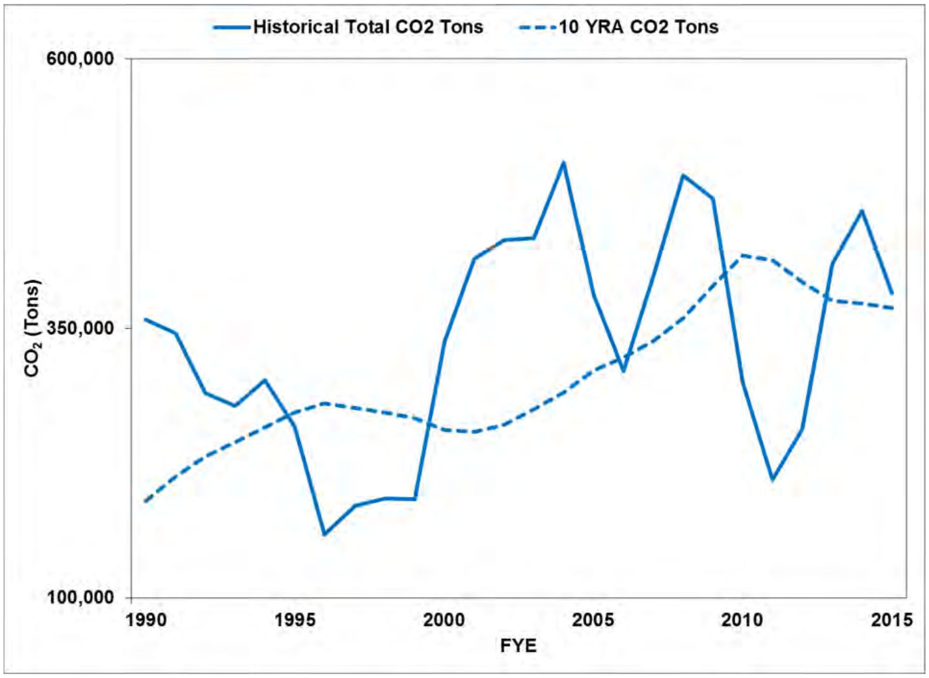
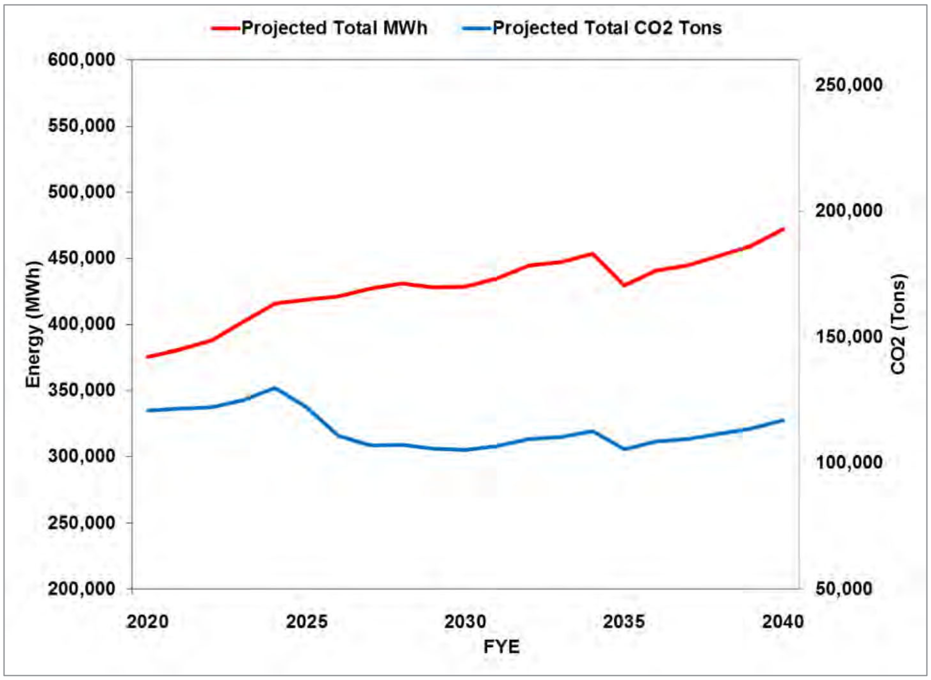


Exhibit 12W
LADWP Projected Water System Energy and GHG Profile



LADWP's current projections also include goals mandated by Mayor Eric Garcetti through ED5, issued on October 14, 2014, although they have been adjusted since the time of original reporting with updated information being made available. This directive established a goal of reducing imported MWD purchases 50 percent by FYE 2024 from base year FYE 2014; this target year was later changed to FYE 2025 by pLAn, released April 8, 2015. Additionally, ED5 set a goal for a 20 percent reduction in per capita water consumption by FYE 2017. LADWP was originally directed to present a report within 90 days that included an estimate of the resulting reductions in greenhouse gas emissions. Based on data available at the time, it was expected that the goal for decreasing per capita consumption would result in a reduction in MWD purchases beyond 50 percent by FYE 2024. Consequently, the percent reduction in GHG was estimated to be 73 percent by that year, assuming average hydrologic conditions and achievement of the 2014 RSC. As stated above, this original projection has since been superseded by current projections. Exhibit 12X represents the original reporting on ED5 and shows estimated Water System energy consumption and associated carbon emissions for baseline FYE 2014 and average and dry conditions for FYE 2024.

Exhibit 12X provides a breakdown of local and imported supply sources for the base year FYE 2014 and target year FYE 2024 along with estimated energy consumption and carbon footprint. Average and dry year conditions are shown for the projections to exemplify the effect of hydrology on the carbon footprint of the water system, although average conditions were used for reporting purposes. Local sources such as groundwater and recycled water are relatively resilient to local hydrological conditions as they are not directly dependent on precipitation quantities for any given year. For this reason, volumes delivered are identical for the projections for average and dry years. The volumes for each were projected to increase according to accelerated 2010 UWMP goals. These goals have since been revised for the 2015 UWMP. Increases in these local sources are expected to displace energy intensive, purchased MWD water thus helping to reduce the carbon footprint. LAA supply is an "energy free" source of water, aside from the energy required to treat it. However, as stated above, LAA supply is extremely dependent on hydrologic conditions. Because FYE 2014 was a dry year, the actual quantity delivered was very close to that for the FYE 2024 dry year projection. For the average year projection, a more abundant supply would offset a significant quantity of MWD water. As stated in previous sections, major swings in the carbon footprint of the water system are largely due to this relationship between hydrology, LAA and MWD supplies. Again, projections for LAA run-off are slightly reduced to account for climate change effects.

Supply sources that are not shown as having a carbon footprint are water transfers and distributed stormwater capture. Sources for future water transfer agreements are currently unknown, so it is not possible to estimate the associated energy intensity. Distributed stormwater capture projects would offset household potable water use for irrigation, etc. and would consist of devices such as cisterns (rain barrels) to collect raw water. As such, they would require no measureable energy for conveyance or treatment.

By far, the projected increase in conservation from baseline year FYE 2014 would have the largest impact on displacement of MWD purchases. To meet the mayor's target of 20 percent per capita reduction by FYE 2017, LADWP planned for highly accelerated conservation measures, and the reductions would be preserved and increased through FYE 2024, as can be seen by the value of 136,943 AFY by FYE 2024. Because conservation is relatively independent of hydrology, the projected values for average and dry conditions are the same. An additional benefit to conservation when compared to local supplies is that there is no associated carbon footprint, so the energy savings is equal to the carbon footprint of imported sources.

Local sources, however, come with an opportunity cost since they do have a carbon footprint.

Other factors included in ED5 estimates of carbon emissions savings for FYE 2024 include reductions in the carbon emissions factors for both LADWP and imported supply sources. As mentioned, LADWP projections for carbon factors were based on the RSC from the 2014 IRP and include measures to convert to more renewable energy sources. These reductions would affect local sources and their treatment, treatment for most of the MWD water and all LAA treatment. State-wide mandates for renewable energy at the time of reporting were also projected to affect carbon emission factors for imported sources, such as the SWP and CRA, as well as treatment for a small part of this supply to LADWP by MWD.

The resulting percent reduction in carbon emissions, based on ED5 goals and other factors current to the reporting period, was 73 percent. The controlling factor for these reductions was the 20 percent per capita reduction goal. Note that these projections, presented within the mandatory 90-day reporting period, were based on information and data available at the time and have since been superseded. They are presented for historical purposes only.

Exhibit 12X
LADWP Water System Initial Estimated Energy Profile and Associated GHG Based on ED5 Goals

		FY 2013-14	FY 2023-24		% change	
			Average	Dry	Average	Dry
Local Groundwater	Volume Delivered (AF)	79,403	111,170	111,170	40%	40%
	Total MWh	46,054	64,479	64,479	40%	40%
	Carbon Footprint (tons CO_2)	25,297	21,581	21,581	-15%	-15%
Recycled Water	Total Volume Delivered (AF)	10,054	50,686	50,686	404%	404%
	Total MWh	13,547	111,425	111,425	723%	723%
	Carbon Footprint (tons CO_2)	7,441	37,294	37,294	401%	401%
Distribution	Volume Delivered (AF)	582,297	459,502	459,502	-21%	-21%
	Total MWh	114,130	90,062	90,062	-21%	-21%
	Carbon Footprint (tons CO_2)	62,691	30,144	30,144	-52%	-52%
Los Angeles Aqueduct	Volume Delivered (AF)	61,024	278,908	79,240	357%	30%
	Total MWh	2,075	17,208	4,889	729%	136%
	Carbon Footprint (tons CO_2)	1,140	5,759	1,636	405%	44%
Metropolitan Water District (MWD)	Volume Delivered (AF)	441,870	29,424	229,092	-93%	-48%
	Total MWh	1,116,586	78,520	611,346	-93%	-45%
	Carbon Footprint (tons CO_2)	347,666	22,440	174,715	-94%	-50%
Water transfers	Volume Delivered (AF)	0	40,000	40,000		
	Total MWh	0	2,468	2,468		
	Carbon Footprint (tons CO_2)	0	826	826		
Stormwater (Distributed)	Volume Delivered (AF)	0	5,000	5,000		
Conservation	Volume Delivered (AF)	0	136,943	136,943		
Transfer, Spill and Storage	Volume Delivered (AF)	5,764				
Total AF		**586,587**	**652,131**	**652,131**	**11%**	**11%**
Total MWh		**1,292,392**	**364,162**	**884,669**	**-72%**	**-32%**
Total CO_2 tons		**444,235**	**118,044**	**266,196**	**-73%**	**-40%**

Although projections are subject to change due to changing climatic conditions, technological improvement and policy changes, the employed strategies represent a long-term, multi-faceted approach to reducing LADWP's carbon footprint.

12.3.2 MWD Adaption and Mitigation

MWD is taking an active approach to adapt and mitigate against climate changes in its operations. Adaption and mitigation measures include:

- Investments in local resources to diversify MWD's water supply portfolio.
- Tracking climate change legislation – MWD provides input and direction on legislation.
- Collaborating on climate change with state, federal, and non-governmental agencies.
- Monitoring state and local climate change actions.
- Investigating the water supply and energy nexus.
- Coordinating with large water retailers.
- Integrating climate change into integrated resource planning as discussed in Chapter 10, Integrated Resource Planning.
- Sharing climate change knowledge and providing support – founding member of Water Utility Climate Alliance.
- Adopting energy management policies to support cost-effective and environmentally responsible programs, projects, and initiative.

MWD has also taken structural adaption measures including construction of the Inland Feeder. The Inland Feeder, completed in 2009, connects MWD's SWP supplies with MWD's CRA supplies and allows delivery of SWP supplies to MWD's major reservoir, Diamond Valley Lake. In relation to climate change, the project will increase conveyance capacity by allowing more rain to be conveyed as projected snowpack levels decrease and allow MWD to capture rain associated with projected short duration high intensity storms.

Urban Water
Management Plan
Appendix A

Urban Water Management Planning Act

California Water Code Division 6, Part 2.6.

Chapter 1. General Declaration and Policy

SECTION 10610-10610.4

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

SECTION 10611-10617

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

SECTION 10620-10621

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, except as provided in subdivision (d).

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before 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.

(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).

(d) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

Article 2. Contents of Plan

SECTION 10630-10634

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 that 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 basins that 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) (1) 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.

(2) 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.

(J) Distribution system water loss.

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

(3) (A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(4) (A) If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

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

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(g) 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 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.

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

(i) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(j) An urban water supplier that relies 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).

10631.1. (a) 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.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has

submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) 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. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

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

(1) 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 that are applicable to each stage.

(2) 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.

(3) 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.

(4) 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.

(5) 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.

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

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), 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.

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

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

(b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

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, indirect potable reuse, 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

SECTION 10635

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.

Article 3. Adoption and Implementation of Plans

SECTION 10640-10645

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) (1) 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.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) (1) Notwithstanding Section 10231.5 of the Government Code, 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 exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to 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.

(2) A report to be submitted pursuant to paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

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

SECTION 10650-10656

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.

Urban Water
Management Plan

Appendix B

Urban Water Management Plan Checklist and Standard Tables

Checklist Arranged by Water Code Section

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location (Optional Column for Agency Use)
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	p 3-5 (Sec 3.1.2) & p 3-6 (Exh 3C)
10608.20(e)	Retail suppliers shall 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.	Baselines and Targets	Chapter 5 and App E	p 3-5 (Sec 3.1.2) & p 3-6 (Exh 3C) p B25 (SB X7-7 Table 1-9)
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	p 3-5 (Sec 3.1.2) & p 3-6 (Exh 3C)
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	p 3-5 (Sec 3.1.2) & p 3-6 (Exh 3C)
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	No adjustment applied
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	App D, 2 Public Hearings were held on 3/3/16 and 3/9/16
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	Not Applicable

2015 UWMP Checklist

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	App B: Table 5-1
10620(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.	Plan Preparation	Section 2.1	LADWP updates its UWMP every 5 years since 1985
10620(d)(2)	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.	Plan Preparation	Section 2.5.2	Various pages reference reports, communication, and coordination with City Planning, Bureau of Sanitation, MWD, SCAG, TreePeople, and other agencies & stakeholders. Appendix D documents public involments.
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	p ES-1
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	App D p D4
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	To be submitted June 2016
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	p 1-8 (Sec 1.3)
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	p 1-12 (Sec 1.3.3) & Exh 1E

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	p 1-9(Sec 1.3.2) & p 1-10(Exh 1B)
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	p 1-9 (Sect 1.3.2) & p 1-11 (Exh 1C)
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	p 1-11 (Exh 1C), p 2-9 (Exh 2G) & p 2-9 (Sec 2.3.2: housing, employment, socioeconomic variables)
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	p 11-11 (Exh 11F, 11G, 11H) & p 11-20 (Exh 11K)
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	p 6-4 (Exh 6B) & p 6-24 (Exh 6I)
10631(b)(1)	Indicate whether a groundwater management plan has 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.	System Supplies	Section 6.2.2	p 6-2 (Sec 6.1) & App F
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	Beginning of each section describes individual basin: p 6-5 (Sec 6.2), p 6-12 (Sec 6.3), p 6-14 (Sec 6.4), p 6-16 (Sec 6.5)
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	p 6-2 (Sec 6.1) & App F

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	Not Applicable
10631(b)(3)	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	System Supplies	Section 6.2.4	p 6-2 (Sec 6.1) & p 6-4 (Exh 6B)
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	p 6-24 (Sec 6.11 & Exh 6I)
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	p 11-3 (Sec 11.2)
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	p 11-11 (Exh 11F, 11G, 11H)
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	p 11-4 (Sec 11.2.2 - 11.2.7)
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	p 9-1 (Sec 9.1)
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	p 2-3 (Exh 2C: Historical) & p 2-9 (Exh 2G: Projected)
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	p 3-32 (Sec 3.2.4: Water Loss) & App G

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	p 3-14 (Sec 3.2.3), p 3-16(Exh 3F) & App H
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	Not Applicable
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	RW: p 4-27 (Sec 4.4.1), p 4-32 (Sec 4.4.2), & p 4-33 (Sec 4.4.3) GW: begins p 6-5 (Sec 6.2: SFB Remediation), p 6-16 (Sec 6.4: Manhattan Wellfield Improvement). SWC: p 7-12 (Sec 7.4 Centrilized Projects) & p 7-20 (Sec 7.5.2 Distributed Projects)
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	p 9-6 (Sec 9.3)
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	App H
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	App D (Email to MWD with Exhibits 11F, 11G, 11H) p D32

2015 UWMP Checklist

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	Not Applicable
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	p 2-14 (Exh 2O)
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	p 11-16 (Sec 11.4.1)
10632(a)(2)	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.	Water Shortage Contingency Planning	Section 8.9	p 11-19 (Sec 11.4.2)
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	p 11-21 (Sec 11.4.3)
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	p 11-22 (Sec 11.4.4)
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	p 11-24 (Sec 11.4.5)
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	p 11-25 (Sec 11.4.6)

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	p 11-26 (Sec 11.4.7)
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	p 11-26 (Sec 11.4.8) & App I
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	p 11-28 (Sec 11.4.9)
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	P 4-1 (Sect 4.0), p 10-1 (Sec 10.1)
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	p 4-9 (Sec 4.2 & Exh 4C)
10633(b)	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.	System Supplies (Recycled Water)	Section 6.5.2.2	p 4-9 (Sec 4.2 & Exh 4C)
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	p 4-13 (Sec 4.3), p 4-14 (Exh 4E), p 4-15 (Exh 4F), p 4-18 (Exh 4H), p 4-20 (Exh 4J), p 4-23 (Exh 4L)
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	p 4-27 (Sec 4.4.1)

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10633(e)	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.	System Supplies (Recycled Water)	Section 6.5.4	p 4-25 (Sec 4.3.5 & Exh 4N), p 4-25 (Sec 4.4 & Exh 4O)
10633(f)	Describe the actions 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.	System Supplies (Recycled Water)	Section 6.5.5	p 4-35 (Sec 4.4.5)
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	p 4-25 (Sec 4.4)
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	p ES-26 (Water Quality). p 4-36 (Sec 4.4.6), p 5-14 (sec 5.5), p 6-8 (Sec 6.2), p 6-13 (Sec 6.3), p 6-15 (Sec 6.4) , p 6-17 (Sec 6.5), p 6-20 (Sec 6.9), p 8-9 (Sec 8.1.1.3), p 8-17 (Sec 8.1.2.3.)
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	p 11-3 (Sec 11.2) & p 11-11 (Exh 11F, 11G, 11H)
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	To be enclosed with transmittal letter to DWR

CWC Section	UWMP Requirement	Subject	Guidebook Location	**UWMP Location** *(Optional Column for Agency Use)*
10642	Provide supporting documentation that the water supplier has encouraged 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.	Plan Preparation	Section 2.5.2	App D
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	App D
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	App D
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Adoption resolution included within cover page
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	To be enclosed with transmittal letter to DWR
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	To be enclosed with transmittal letter to DWR & also satisfy CWC 10635 (b)
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Will submit electronically no later than July 1st, 2016
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	To be enclosed with transmittal letter to DWR

Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA1910067	Los Angeles-City, Dept. of Water & Power	704,176	520,905
	TOTAL	704,176	520,905

NOTES: Volume of water supplied in 2015 includes 10,421 AF of recycled water. Public Water System Number Source = https://iaspub.epa.gov/enviro/sdw_form_v3.create_page?state_abbr=CA

Table 2-2: Plan Identification

Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

Table 2-3: Agency Identification

Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☐	UWMP Tables Are in Calendar Years
☑	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
7/1	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF

Table 2-4 Retail: Water Supplier Information Exchange

The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.

Wholesale Water Supplier Name *(Add additional rows as needed)*

Metropolitan Water District of Southern California

NOTES: Metropolitan was notified in accordance with CWC 10631, on February 12, 2016.

Table 3-1 Retail: Population - Current and Projected

	2015	2020	2025	2030	2035	2040*(opt)*
Population Served	3,987,622	4,026,891	4,168,131	4,210,042	4,351,408	4,441,545

NOTES: Demographic projections were provided for the LADWP service area by MWD who received projected demographic data from Southern California Association of Governments (SCAG). SCAG allocated its 2012 Regional Transportation Plan demographic data into water service areas for MWD's member agencies.

Table 4-1 Retail: Demands for Potable and Raw Water - Actual

Use Type *(Add additional rows as needed)*	2015 Actual		
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Single Family		Drinking Water	193,076
Multi-Family		Drinking Water	151,873
Commercial	includes services designated as irrigation services	Drinking Water	96,299
Industrial		Drinking Water	19,121
Institutional/Governmental	includes services designated as irrigation services	Drinking Water	34,883
Other	includes preliminary estimate of non-revenue water	Drinking Water	15,232
		TOTAL	510,484

NOTES: Dedicated irrigation meters are included in Commercial and Institutional/Governmental categories and are not tracked individually. LADWP is still analyzing parameters required for the AWWA water balance to finalize FY14/15's non-revenue volume.

Table 4-2 Retail: Demands for Potable and Raw Water - Projected

Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*		2020	2025	2030	2035	2040-opt
Single Family		222,958	213,479	215,520	220,526	220,517
Multi-Family		184,679	197,196	202,585	207,202	217,125
Commercial	Includes Govt'l	132,200	128,783	125,876	122,075	122,242
Industrial		15,469	8,756	1,922	1,325	1,050
Losses		36,709	37,492	37,983	38,521	39,351
	TOTAL	592,000	585,700	583,900	589,600	600,300

NOTES: Demand numbers have been reduced by projected code based savings. Significant reduction in Industrial usage due to customers switching to recycled water.

Table 4-3 Retail: Total Water Demands

	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	510,484	592,000	585,700	583,900	589,600	600,300
Recycled Water Demand* *From Table 6-4*	36,738	46,540	85,740	95,740	98,940	102,140
TOTAL WATER DEMAND	547,222	638,540	671,440	679,640	688,540	702,440

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES: Projected recycled water for environmental use of 26,740 AFY is automatically included in this table. However, it is not included in our water demand projection as shown in Exhibit 2K of LADWP's 2015 UWMP.

Table 4-4 Retail: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
"07/2013"	30,751

** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*

Table 4-5 Retail Only: Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	Location in UWMP: Section 2.3.3
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

Table 5-1 Baselines and Targets Summary

Retail Agency or Regional Alliance Only

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	*1996*	*2005*	*154*	*148*	*142*
5 Year	*2004*	*2008*	*152*		

*All values are in Gallons per Capita per Day (GPCD)

NOTES: Per capita water use targets are calculated per SB X7-7.

Table 5-2: 2015 Compliance

Retail Agency or Regional Alliance Only

Actual 2015 GPCD*	2015 Interim Target GPCD*	**Optional Adjustments to 2015 GPCD** *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
114	148	0	0	0	0	114	114	Yes

**All values are in Gallons per Capita per Day (GPCD)*

NOTES:

Table 6-1 Retail: Groundwater Volume Pumped

☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2011	2012	2013	2014	2015
Add additional rows as needed						
Alluvial Basin	San Fernando Groundwater Basin	44,029	50,244	50,550	68,784	80,097
Alluvial Basin	Central Basin	5,099	9,486	6,310	9,727	6,948
Alluvial Basin	Sylmar Basin	225	1,330	1,952	891	0
Alluvial Basin	West Coast Basin	0	0	0	0	0
	TOTAL	49,353	61,060	58,812	79,402	87,045

NOTES:

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Add additional rows as needed						
LASAN	Metered	38,000	*LASAN*	**Donald C. Tillman WRP**	Yes	No
LASAN	Metered	16,000	*LASAN*	**Los Angeles-Glendale WRP**	Yes	No
LASAN	Metered	18,000	*LASAN*	**Terminal Island WRP**	Yes	No
LASAN	Metered	294,000	*LASAN*	**Hyperion WRP**	Yes	No
Total Wastewater Collected from Service Area in 2015:		366,000				
NOTES: WRP = Water Reclaimation Plant, LASAN = City of Los Angeles, Bureau of Sanitation						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
							2015 volumes			
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level *Drop down list*	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
Donald C. Tillman WRP	Outfall to LA River	Los Angeles River	4 19I005179	River or creek outfall	Yes	Tertiary	38,000	6,400	31,600	0
Los Angeles-Glendale WRP	Outfall to LA River	Los Angeles River	4 19I005012	River or creek outfall	Yes	Tertiary	16,000	11,100	3,200	1,700
Terminal Island WRP	Outfall to LA Harbor	Los Angeles Harbor	4 19I005178	Bay or estuary outfall	Yes	Tertiary	18,000	12,500	5,500	0
Hyperion WRP	5-mile outfall	Pacific Ocean	4 19I005011	Ocean outfall	Yes	Secondary, Undisinfected	294,000	243,500	12,200	38,300
						Total	366,000	273,500	52,500	40,000
NOTES: 38,300 AF of secondary effluent was delivered to WBMWD from Hyperion WRP.										

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area								
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Name of Agency Producing (Treating) the Recycled Water:		**Los Angles Deptartment of Public Works - Bureau of Sanitation**						
Name of Agency Operating the Recycled Water Distribution System:		**Los Angeles Department of Water and Power**						
Supplemental Water Added in 2015		**none**						
Source of 2015 Supplemental Water		**none**						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (excludes golf courses)	**Parks, Sports Complexes, Schools, Apartments,**	Tertiary	2,567	4,500	7,600	8,800	8,800	8,800
Golf course irrigation		Tertiary	2,811	3,800	3,800	3,800	3,800	3,800
Commercial use								
Industrial use	**cooling towers, process refineries, dust control**	Tertiary	15	3,400	9,500	15,800	15,800	15,800
Geothermal and other energy production		Tertiary	596	600	600	600	600	600
Seawater intrusion barrier	**Dominguez Gap**	Advanced	4,432	7,500	7,500	7,500	7,500	7,500
Recreational impoundment								
Wetlands or wildlife habitat	**Augmenting lake flows to 4 different lakes**	Tertiary	26,317	26,740	26,740	26,740	26,740	26,740
Groundwater recharge (IPR)*		Advanced	0	0	30,000	30,000	30,000	30,000
Surface water augmentation (IPR)*								
Direct potable reuse								
Other *(Provide General Description)*	**Conceptual Planning**	Tertiary				2,500	5,700	8,900
		Total:	36,738	46,540	85,740	95,740	98,940	102,140
**IPR - Indirect Potable Reuse*								
NOTES:								

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual

☐ Recycled water was not used in 2010 nor projected for use in 2015.
The supplier will not complete the table below.

Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation			
Landscape irrigation (excludes golf courses)			
Golf course irrigation			
Commercial use			
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier		3,000	4,432
Recreational impoundment			
Wetlands or wildlife habitat		26,990	26,317
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Municipal & Industrial*	20,000	5,989
	Total	49,990	36,738

NOTES: 2010 Municipal and Industrial Use was projected as aggregate total; projections for M&I subcategories are not available.

Table 6-6 Retail: Methods to Expand Future Recycled Water Use

☐ Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.

Provide page location of narrative in UWMP

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
Harbor Area Expansion	mostly industrial non-potable reuse	2023	12,820
Metro Area Expansion	mostly non-potable reuse for landscape	2022	3,693
Valley Area Expansion	mostly non-potable reuse for landscape	2019	963
Westside Area Expansion	mostly non-potable reuse for landscape	2025	1,396
GWR	Groundwater Replenishment	2024	30,000
Long-term Planning	mostly non-potable reuse	2040	16,400
		Total	65,272

NOTES: See LADWP 2015 UWMP Exhibits 4Q, 4R, 4S, 4T, Section 4.4.2, and Section 4.4.3.

Table 6-7 Retail: Expected Future Water Supply Projects or Programs

☐ No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.

☐ Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.

Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Agency *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						
Non-potable Reuse Projects	Yes	LASAN	Increased NPR connections for irrigation, industrial and commercial use	2040	All Year Types	35,000
Groundwater Replenishment	Yes	LASAN	Replenishing the San Fernando Basin with high quality Recycled Water	2024	All Year Types	30,000
Stormwater Harvesting	Yes	MWD	Rebate for rain barrels and cisterns. Funding partnership with public agency, and private partnerships with ngo's that install systems.	2040	All Year Types	400 - 2,000
Stormwater Recharge	Yes	LA County Flood Control	Recharge will allow for increased pumping	2040	All Year Types	15,000
Conservation	Yes	MWD	Ordinances mandate efficient water uses. Rebates for commercial and residential customers. Public outreach, advertising, and education on water use efficiency.	2040	All Year Types	108,100 - 143,500

NOTES: All supplies are planned for use in all year types. LASAN = Los Angeles Bureau of Sanitation; MWD = Metropolitan Water Distict of Southern California

Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Groundwater	From the San Fernando Basin, Sylmar Basin, and Central Basin	90,438	Raw Water	
Purchased or Imported Water	Los Angeles Aqueduct	57,535	Raw Water	
Purchased or Imported Water	Metropolitan Water District of Southern California	66,309	Drinking Water	
Purchased or Imported Water	Metropolitan Water District of Southern California	296,298	Raw Water	
Stormwater Use	Distributed capture including rain barrels and cisterns	0	Raw Water	
Recycled Water	Non-potable Reuse	10,421	Recycled Water	
Supply from Storage		-96	Drinking Water	
	Total	520,905		0

Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		**2020**		**2025**		**2030**		**2035**		**2040** *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed											
Groundwater	*From the San Fernando Basin, Sylmar Basin, and Central Basin*	112,670		110,670		106,670		114,670		114,070	
Purchased or Imported Water	*Los Angeles Aqueduct (Based on Average Year)*	275,700		293,400		291,000		288,600		286,200	
Purchased or Imported Water	*Metropolitan WaterDistrict of Southern California*	75,430		65,930		65,430		60,630		74,930	
Stormwater Use	*Harvesting with Rainbarrels and Cisterns*	400		800		1,200		1,600		2,000	
Recycled Water	*Non-potable Reuse*	19,800		29,000		39,000		42,200		45,400	
Recycled Water	*Groundwater Recharge*	0		30,000		30,000		30,000		30,000	
Stormwater Use	*Centralized Recharge will allow us to pump additional groundwater*	2,000		4,000		8,000		15,000		15,000	
Recycled Water	*Beneficial Reuse*	26,740		26,740		26,740		26,740		26,740	
Other	*LADWP considers Conservation a supply*	125,800		110,900		111,600		109,100		108,100	
	Total	638,540	0	671,440	0	679,640	0	688,540	0	702,440	0

NOTES: Projections based on average weather year as shwon in Exhibit 11H of LADWP's 2015 UWMP, which does not include 26,740 AFY of recycled water for beneficial reuse.

Table 7-1 Retail: Basis of Water Year Data

Year Type	**Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	**Available Supplies if Year Type Repeats**	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	**% of Average Supply**
Average Year	1962-2011	278,000	100%
Single-Dry Year	2015	57,535	21%
Multiple-Dry Years 1st Year	2013	118,402	43%
Multiple-Dry Years 2nd Year	2014	59,313	21%
Multiple-Dry Years 3rd Year	2015	57,535	21%
Multiple-Dry Years 4th Year *Optional*			
Multiple-Dry Years 5th Year *Optional*			
Multiple-Dry Years 6th Year *Optional*			

Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

NOTES: Showing LA Aqueduct supply reliability only. Groundwater & Recycled Water don't vary with weather. MWD supply is used to supplement insufficient local supplies and is not directly co-related to weather.

Table 7-2 Retail: Normal Year Supply and Demand Comparison

	2020	2025	2030	2035	2040 *(Opt)*
Supply totals *(autofill from Table 6-9)*	638,540	671,440	679,640	688,540	702,440
Demand totals *(autofill from Table 4-3)*	638,540	671,440	679,640	688,540	702,440
Difference	0	0	0	0	0

NOTES: Shortages in own supply are made up by wholesaler, therefore supply/demand balance and difference should be zero. 26,740 AF of recycled water to meet beneficial reuse demand is included in the table.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035	2040 (Opt)
Supply totals	669,140	703,640	712,240	721,640	736,240
Demand totals	669,140	703640	712,240	721,640	736,240
Difference	0	0	0	0	0

NOTES: 26,740 AF of recycled water to meet beneficial reuse demand is included in the table.

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	605,140	664,640	682,840	691,540	703,640
	Demand totals	605,140	664,640	682,840	691,540	703,640
	Difference	0	0	0	0	0
Second year	Supply totals	648,640	696,740	710,540	719,840	733,340
	Demand totals	648,640	696,740	710,540	719,840	733,340
	Difference	0	0	0	0	0
Third year	Supply totals	669,140	703,640	712,240	721,640	736,240
	Demand totals	669,140	703,640	712,240	721,640	736,240
	Difference	0	0	0	0	0

NOTES: Based on historical hydrologies from FYE 2013-2015. The worst case scenario is when target year lands on the 3rd year of multi-dry year sequence. 26,740 AF of recycled water to meet beneficial reuse demand is included in the table.

Table 8-1 Retail Stages of Water Shortage Contingency Plan		
	Complete Both	
Stage	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description)*
Add additional rows as needed		
1	0% to 15%	No Shortage
2	15% to 20%	Moderate Shortage
3	20% to 25%	Significant Shortage
4	25% to 35%	Severe Shortage
5	35% to 50%	Critical Shortage
6	>50%	Super Critical Shortage
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Add additional rows as needed			
1	Other - Prohibit use of potable water for washing hard surfaces	No use of a water hose to wash paved surfaces except to alleviate immediate safety or sanitation hazards.	Yes
1	Water Features - Restrict water use for decorative water features, such as fountains	No use of water to clean, fill, or maintain levels in decorative fountains, ponds, lakes or similar structures used for aesthetic purposes unless a recirculating system is used.	Yes
1	CII - Restaurants may only serve water upon request	No drinking water shall be served unless expressly requested in restaurants, hotels, cafes, cafeterias, or other public places where food is sold, served, or offered for sale.	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	No leaks from any pipes or fixtures on a customer's premises; failure or refusal to fix leak in a timely manner shall subject the customer penalties for a prohibited use of water.	Yes

1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	No washing vehicles with a hose if the hose does not have a self-closing water shut-off device attached or the hose is allowed to run continuously while washing a vehicle.	Yes
1	Landscape - Other landscape restriction or prohibition	No irrigation during rain or within 48 hours after a measureable rain event.	Yes
1	Landscape - Limit landscape irrigation to specific times	No irrigation between 9am - 4pm	Yes
1	Landscape - Other landscape restriction or prohibition	All irrigation with potable water using spray head and bubblers shall be limited to no more than ten minutes per water day per station. Irrigation of landscape with potable water using rotors and multi-stream rotary heads shall be limited to no more than 15 minutes per cycle and up to 2 cycles per water day per station.	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	No watering or irrigation of any lawn, landscape, or other vegetated area shall occur in a manner that causes or allows excess or continuous water flow or runoff onto an adjoining sidewalk, driveway, street, gutter, or ditch.	Yes
1	CII - Other CII restriction or prohibition	Installation of single pass cooling systems prohibited at for new water service requests	Yes
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.	Yes

1	CII - Lodging establishment must offer opt out of linen service	Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily.	Yes
1	Other	No large landscape areas shall have irrigation systems without rain sensors that shut off the irrigation systems. Large landscape areas with approved weather-based irrigation controllers registered with LADWP are compliant.	Yes
2	Landscape - Limit landscape irrigation to specific days	Limits customers to 3-day a week watering with reduced watering duration times.	Yes
3	Landscape - Limit landscape irrigation to specific days	Limit customers to 2-day a week watering with reduced watering duration times.	Yes
3	Pools and Spas - Require covers for pools and spas	Recommend use of pool covers.	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Recommend washing of vehicles at commercial car wash facilities.	Yes
4	Landscape - Limit landscape irrigation to specific days	Limit customers to 1-day a week watering with reduced watering duration times.	Yes
4	Pools and Spas - Require covers for pools and spas	Use of swimming pool covers on all residential swimming pools when not in use.	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	No washing of vehicles allowed except at commercial car washes.	Yes
5	Landscape - Prohibit all landscape irrigation	No landscape irrigation is allowed.	Yes
5	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	No filling of residential swimming pools and spas with potable water.	Yes

6	Other	The Board is authorized to implement additional water restrictions based on supply situation; Prohibitions are not applicable for use of water necessary for public health and safety; Customers may apply for a variance under undue hardship circumstances	Yes

Table 8-3 Retail Only:
Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*
Add additional rows as needed		
	Expand Public Information Campaign	Partnering with the Mayor's Office, LADWP is running the "Save the Drop" Focused Outreach Campaign which includes conservation messaging through radio, television, print, and ads on bus tails, bus benches, and bus shelters.
	Provide Rebates on Plumbing Fixtures and Devices	LADWP offers a wide variety of rebates for its commercial and residential customers which includes toilets, clothes washers, showerheads, aerators, and rain barrels & cisterns.
	Provide Rebates for Landscape Irrigation Efficiency	LADWP offers its commercial and residential customers rebates for efficient sprinkler nozzles, weather based irrigation controllers, and moisture sensor systems.
	Provide Rebates for Turf Replacement	LADWP provides a rebate to commercial and residential customers who remove turf and replace with California Friendly landscaping. To date, LADWP has removed over 32 million square feet of turf through these programs.
	Reduce System Water Loss	LADWP completed its Water Loss Audit and Component Analysis Study in 2013 and has formed a Water Loss Task Force comprising of over 100 staff. The Task Force has evaluated the Study's recommendations and has begun implementing cost-effective strategies to further reduce water loss.
	Increase Water Waste Patrols	LADWP has a Water Conservation Response Unit, a dedicated conservation enforcement team, which comprises of 6 full-time staff that responds to water waste reports and patrols the City for water waste violations.

	Offer Water Use Surveys	LADWP offers its customers water use surveys to identify strategies to reduce their water use. LADWP has also sent out water conservaiton letters to its top 1% residential water users. The letters remind customers on the importance of conserving during the drought, and offers these customers a water audit by LADWP staff to identify measures they can take to reduce water use.
	Decrease Line Flushing	In response to water shortage conditions, LADWP has kept main flushing to a minimum.

NOTES: Reduction methods are on-going programs not tied to any specific stage of our WSCP

Table 8-4 Retail: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	538,900	580,700	601,300

NOTES: See Exhibit 11K

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
West Hollywood	☑	☑
Culver City	☑	☑
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Los Angeles County	☑	☑

SB X7-7 Table 0: Units of Measure Used in UWMP*

(select one from the drop down list)

Acre Feet

**The unit of measure must be consistent with Table 2-3*

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	648,523	Acre Feet
	2008 total volume of delivered recycled water	4,181	Acre Feet
	2008 recycled water as a percent of total deliveries	0.64%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1996	▨
	Year ending baseline period range[3]	2005	▨
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	▨
	Year ending baseline period range[4]	2008	▨

[1] *If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.*

[2] *The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] *The ending year must be between December 31, 2004 and December 31, 2010.*

[4] *The ending year must be between December 31, 2007 and December 31, 2010.*

SB X7-7 Table 2: Method for Population Estimates

	Method Used to Determine Population (may check more than one)
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review

NOTES: LADWP service area population is based on DOF estimates with the following adjustments:

Addition

The areas outside the LA City boundary, but served by LADWP, were delineated using GIS. Population information for each of the delineated areas was taken from US census data at the block level for the years 1990, 2000, and 2010. This population remained fairly stable over this period of time at around 32,600 people. The initial estimate of 28,000 people was established more than 20 years ago. Based on the recent study, this adjustment was increased by 4,600 people starting from 2010.

Subtraction

The population living within the City of LA but served by others was determined by surveying City housing units that are not reachable by LADWP's service lines. This population also remains fairly constant at 2,000 people.

SB X7-7 Table 3: Service Area Population

Year		Population
10 to 15 Year Baseline Population		
Year 1	1996	3,568,651
Year 2	1997	3,584,227
Year 3	1998	3,613,170
Year 4	1999	3,653,878
Year 5	2000	3,705,600
Year 6	2001	3,740,515
Year 7	2002	3,766,481
Year 8	2003	3,786,410
Year 9	2004	3,799,549
Year 10	2005	3,795,131
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2004	3,799,549
Year 2	2005	3,795,131
Year 3	2006	3,794,645
Year 4	2007	3,790,063
Year 5	2008	3,800,497
2015 Compliance Year Population		
2015		3,987,622

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Deductions**					**Annual Gross Water Use**
			Exported Water	**Change in Dist. System Storage** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use**	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1996	601,559		(2,738)	-		-	604,297
Year 2	1997	628,539		1,120	-		-	627,419
Year 3	1998	591,309		2,681	-		-	588,627
Year 4	1999	617,840		(2,973)	-		-	620,813
Year 5	2000	659,678		(1,909)	-		-	661,586
Year 6	2001	658,800		2,055	-		-	656,746
Year 7	2002	661,553		(5,036)	-		-	666,588
Year 8	2003	653,110		1,990	-		-	651,119
Year 9	2004	684,476		(2,938)	-		-	687,414
Year 10	2005	615,309		2,080	-		-	613,229
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**637,784**
5 Year Baseline - Gross Water Use								
Year 1	2004	684,476		(2,938)	-		-	687,414
Year 2	2005	615,309		2,080	-		-	613,229
Year 3	2006	628,385		2,603	-		-	625,782
Year 4	2007	666,096		277	-		-	665,819
Year 5	2008	645,781		1,439	-		-	644,342
5 year baseline average gross water use								**647,317**
2015 Compliance Year - Gross Water Use								
2015		510,580	-	96	-		-	**510,484**

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source Los Angeles Aqueduct

This water source is:

☐ The supplier's own water source

☑ A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment ** Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1996	466,584		466,584
Year 2	1997	445,400		445,400
Year 3	1998	396,519		396,519
Year 4	1999	424,499		424,499
Year 5	2000	293,075		293,075
Year 6	2001	238,747		238,747
Year 7	2002	228,224		228,224
Year 8	2003	203,372		203,372
Year 9	2004	224,728		224,728
Year 10	2005	297,828		297,828
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2004	224,728		224,728
Year 2	2005	297,828		297,828
Year 3	2006	368,878		368,878
Year 4	2007	277,817		277,817
Year 5	2008	151,506		151,506
2015 Compliance Year - Water into Distribution System				
2015		57,535		57,535

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 4-A: Volume Entering the Distribution

Name of Source Local Groundwater

This water source is:

☑ The supplier's own water source

☐ A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment ** Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,996	71,083		71,083
Year 2	1,997	109,826		109,826
Year 3	1,998	98,932		98,932
Year 4	1,999	125,381		125,381
Year 5	2,000	126,649		126,649
Year 6	2,001	85,077		85,077
Year 7	2,002	69,660		69,660
Year 8	2,003	87,505		87,505
Year 9	2,004	92,497		92,497
Year 10	2,005	66,792		66,792
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,004	92,497		92,497
Year 2	2,005	66,792		66,792
Year 3	2,006	50,620		50,620
Year 4	2,007	92,899		92,899
Year 5	2,008	73,314		73,314
2015 Compliance Year - Water into Distribution System				
2015		90,438		90,438

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 4-A: Volume Entering the Distribution

Name of Source Metropolitan Water District of So. Cal.

This water source is:

☐ The supplier's own water source

☑ A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment ** Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,996	63,892		63,892
Year 2	1,997	73,314		73,314
Year 3	1,998	95,857		95,857
Year 4	1,999	67,961		67,961
Year 5	2,000	239,953		239,953
Year 6	2,001	334,976		334,976
Year 7	2,002	363,669		363,669
Year 8	2,003	362,232		362,232
Year 9	2,004	367,251		367,251
Year 10	2,005	250,689		250,689
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,004	367,251		367,251
Year 2	2,005	250,689		250,689
Year 3	2,006	208,888		208,888
Year 4	2,007	295,380		295,380
Year 5	2,008	420,961		420,961
2015 Compliance Year - Water into Distribution System				
2015		362,607		362,607

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)

Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1996	3,568,651	604,297	151
Year 2	1997	3,584,227	627,419	156
Year 3	1998	3,613,170	588,627	145
Year 4	1999	3,653,878	620,813	152
Year 5	2000	3,705,600	661,586	159
Year 6	2001	3,740,515	656,746	157
Year 7	2002	3,766,481	666,588	158
Year 8	2003	3,786,410	651,119	154
Year 9	2004	3,799,549	687,414	162
Year 10	2005	3,795,131	613,229	144
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**154**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2004	3,799,549	687,414	162
Year 2	2005	3,795,131	613,229	144
Year 3	2006	3,794,645	625,782	147
Year 4	2007	3,790,063	665,819	157
Year 5	2008	3,800,497	644,342	151
5 Year Average Baseline GPCD				**152**
2015 Compliance Year GPCD				
2015		3,987,622	510,484	**114**

SB X7-7 Table 6: Gallons per Capita per Day

Summary From Table SB X7-7 Table 5

10-15 Year Baseline GPCD	154
5 Year Baseline GPCD	152
2015 Compliance Year GPCD	114

SB X7-7 Table 7: 2020 Target Method

Select Only One

Target Method		Supporting Documentation
☐	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☑	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1

20% Reduction

10-15 Year Baseline GPCD	**2020 Target GPCD**
154	**123**

SB X7-7 Table 7-E: Target Method 3

Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☐		Tulare Lake	188	179
☐		South Lahontan	170	162
☑	100%	South Coast	149	142
☐		Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**142**

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
152	145	142	**142**

[1] *Maximum 2020 Target is 95% of the 5 Year Baseline GPCD*

[2] *2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

SB X7-7 Table 8: 2015 Interim Target GPCD

Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
142	154	**148**

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)*					2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
		Enter "0" if Adjustment Not Used			TOTAL Adjustments	Adjusted 2015 GPCD		
		Extraordinary Events	Weather Normalization	Economic Adjustment				
114	148	-	-	-	-	114	114	**YES**

Urban Water
Management Plan

Appendix C

Water Rate Ordiance

ORDINANCE NO. 184130

An ordinance approving the rates fixed by the Department of Water and Power of the City of Los Angeles and to be charged for water and water service supplied by the Department to its customers, and approving the time and manner of payment for such water and water services.

THE PEOPLE OF THE CITY OF LOS ANGELES DO ORDAIN AS FOLLOWS:

Section 1. That the rates to be charged and collected and the terms, provisions and conditions to be effective respecting such rates for water and water service supplied by the Department of Water and Power (Department) of the City of Los Angeles (City) to its customers, heretofore fixed by Resolution No. 016-130, adopted by the Board of Water and Power Commissioners on December 15, 2015, are hereby approved. Such rates and conditions so fixed are as set forth in the following sections.

Sec. 2. That such service supplied to customers shall be in accordance with rate schedules prescribed as follows:

A. SCHEDULE A - SINGLE-DWELLING UNIT RESIDENTIAL CUSTOMERS

1. APPLICABILITY

Applicable to Single-Dwelling Unit Residential Customers.

2. TERRITORY

City of Los Angeles.

3. COMMODITY CHARGES

Rate Per Hundred Cubic Feet

a. First Tier Usage Block
Usage in first tier usage block shall be billed as follows:

Effective Effective Date	$1.422 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2016	$1.792 and General Provision F, G, H, K, L, R, and S adjustments

Effective July 1, 2017	$1.999 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$2.016 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$2.095 and General Provision F, G, H, K, L, R, and S adjustments

Monthly First Tier Usage Block In Hundred Cubic Feet
0 – 8

b. Second Tier Usage Block

Usage in second tier usage block shall be billed as follows:

Effective Effective Date	$1.422 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2016	$1.792 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2017	$1.999 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$2.016 and General Provision F, G H, K, L, R, and S adjustments

Effective July 1, 2019	$2.095 and General Provision F, G, H, K, L, R, and S adjustments

Low Season (October 1 through May 31)

Monthly Second Tier Usage Blocks
In Hundred Cubic Feet

Lot Size Group	Temperature Zone		
	Low	Medium	High
1 – 7,499 sq. ft.	9 – 11	9 – 11	9 – 11
7,500 – 10,999 sq. ft.	9 – 12	9 – 12	9 – 12
11,000 – 17,499 sq. ft.	9 – 16	9 – 16	9 – 16
17,500 – 43,559 sq. ft.	9 – 18	9 – 18	9 – 18
43,560 sq. ft. and above	9 – 18	9 – 18	9 – 18

High Season (June 1 through September 30)

Monthly Second Tier Usage Blocks
In Hundred Cubic Feet

Lot Size Group	Temperature Zone		
	Low	Medium	High
1 – 7,499 sq. ft.	9 – 14	9 – 15	9 – 17
7,500 – 10,999 sq. ft.	9 – 17	9 – 18	9 – 20
11,000 – 17,499 sq. ft.	9 – 25	9 – 27	9 – 33
17,500 – 43,559 sq. ft.	9 – 29	9 – 32	9 – 39
43,560 sq. ft. and above	9 – 29	9 – 32	9 – 39

c. Third Tier Usage Block
Usage in third tier usage block shall be billed as follows:

Effective Effective Date	$2.168 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2016	$2.538 and General Provision F, G, H, K, L, R, and S adjustments

Effective July 1, 2017	$2.746 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$2.762 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$2.841 and General Provision F, G, H, K, L, R, and S adjustments

Low Season (October 1 through May 31)

Monthly Third Tier Usage Blocks
In Hundred Cubic Feet

Lot Size Group	Temperature Zone		
	Low	Medium	High
1 – 7,499 sq. ft.	12 – 17	12 – 17	12 – 17
7,500 – 10,999 sq. ft.	13 – 20	13 – 20	13 – 20
11,000 – 17,499 sq. ft.	17 – 32	17 – 32	17 – 32
17,500 – 43,559 sq. ft.	19 – 38	19 – 38	19 – 38
43,560 sq. ft. and above	19 – 38	19 – 38	19 – 38

High Season (June 1 through September 30)

Monthly Third Tier Usage Blocks
In Hundred Cubic Feet

Lot Size Group	Temperature Zone		
	Low	Medium	High
1 – 7,499 sq. ft.	15 – 26	16 – 29	18 – 35
7,500 – 10,999 sq. ft.	18 – 35	19 – 38	21 – 44
11,000 – 17,499 sq. ft.	26 – 59	28 – 65	34 – 83
17,500 – 43,559 sq. ft.	30 – 71	33 – 80	40 – 101
43,560 sq. ft. and above	30 – 71	33 – 80	40 – 101

d. Fourth Tier Usage

Usage above third tier usage block shall be billed as follows:

Effective Effective Date	$2.168 and General Provision F, G, H, K, L, R, and S adjustments

Effective July 1, 2016	$2.538 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2017	$2.746 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$2.762 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$2.841 and General Provision F, G, H, K, L, R, and S adjustments

4. BILLING

The bill shall be the sum of the charges for first tier usage, including adjustments to first tier usage pursuant to General Provisions F, G, H, K, L, R, and S, charges for any second tier usage, including adjustments to second tier usage pursuant to General Provisions F, G, H, K, L, R, and S, charges for any third tier usage, including adjustments to third tier usage pursuant to General Provisions F, G, H, K, L, R, and S, and charges for any fourth tier usage, including adjustments to fourth tier usage pursuant to General Provisions F, G, H, K, L, R, and S, less one of the applicable subsidies as described in General Provisions O and P, but the bill shall not be less than zero.

5. SPECIAL CONDITIONS

a. Service Inside the City of Los Angeles
Charges for water service to premises of which ninety percent (90%) or more of the area is inside the City shall be the amount computed at the rates set forth above.

b. Service Outside the City of Los Angeles
Charges for water service to premises of which less than ninety percent (90%) of the area is inside the City shall also include a surcharge equal to the differential cost of treated Tier II water delivered to the City purchased from the Metropolitan Water District and the average cost of water delivered to the City through the

Los Angeles Aqueducts for the previous five years. However, at no time shall the rates be less than those charged for service inside the City.

c. Applicability of Rules and Regulations
Application of this schedule shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

B. SCHEDULE B - MULTI-DWELLING UNIT RESIDENTIAL CUSTOMERS

1. APPLICABILITY

Applicable to Multi-Dwelling Unit Residential Customers.

2. TERRITORY

City of Los Angeles.

3. COMMODITY CHARGES

Rate Per Hundred Cubic Feet

a. First Tier Usage Block
Usage in first tier usage block shall be billed as follows:

Effective Effective Date	$1.422 and General Provision F, G, H, K, L, R, and S adjustments

The first tier usage block shall be the higher of one hundred percent (100%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or one hundred percent (100%) of the customer's average consumption for the period of December 2014 through March 2015, except that the minimum shall not be less than twenty-four (24) hundred cubic feet per month.

Effective July 1, 2016	$1.792 and General Provision F, G, H, K, L, R, and S adjustments

The first tier usage block shall be the higher of ninety-three percent (93%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or ninety-three percent (93%) of the customer's average consumption for the period of December 2014 through March 2015, except that the minimum shall not be less than twenty-four (24) hundred cubic feet per month.

Effective July 1, 2017	$1.999 and General Provision F, G, H, K, L, R, and S adjustments

The first tier usage block shall be the higher of eighty-eight percent (88%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or eighty-eight percent (88%) of the customer's average consumption for the period of December 2014 through March 2015, except that the minimum shall not be less than twenty-four (24) hundred cubic feet per month.

Effective July 1, 2018	$2.016 and General Provision F, G, H, K, L, R, and S adjustments

The first tier usage block shall be the higher of eighty-eight (88%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or eighty-eight percent (88%) of the customer's average consumption for the period of December 2014 through March 2015, except that the minimum shall not be less than twenty-four (24) hundred cubic feet per month.

Effective July 1, 2019	$2.095 and General Provision F, G, H, K, L, R, and S adjustments

The first tier usage block shall be the higher of eighty-eight percent (88%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or eighty-eight percent (88%) of the customer's average consumption for the period of December 2014 through March 2015, except that the minimum shall not be less than twenty-four (24) hundred cubic feet per month.

b. Second Tier Usage
Usage above the first tier usage block shall be billed as follows:

Effective Effective Date	$3.921 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2016	$3.552 and General Provision F, G, H, K, L, R, and S adjustments

Effective July 1, 2017	$3.409 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$3.425 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$3.504 and General Provision F, G, H, K, L, R, and S adjustments

4. BILLING

The bill shall be the sum of the charges for first tier usage, including adjustments to first tier usage pursuant to General Provisions F, G, H, K, L, R, and S, and charges for any second tier usage, including adjustments to second tier usage pursuant to General Provisions F, G, H, K, L, R, and S.

5. SPECIAL CONDITIONS

a. Service Inside the City of Los Angeles
Charges for water service to premises of which ninety percent (90%) or more of the area is inside the City shall be the amount computed at the rates set forth above.

b. Service Outside the City of Los Angeles
Charges for water service to premises of which less than ninety percent (90%) of the area is inside the City shall also include a surcharge equal to the differential cost of treated Tier II water delivered to the City purchased from the Metropolitan Water District and the average cost of water delivered to the City through the Los Angeles Aqueducts for the previous five years. However, at no time shall the rates be less than those charged for service inside the City.

c. Applicability of Rules and Regulations
Application of this schedule shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

d. Special First Tier Usage Block Conditions
(1) If a customer has not established a first tier usage block as prescribed above, the customer shall pay the first tier

Commodity Charges in effect, including adjustments pursuant to the General Provisions, as prescribed in Section 2.B.3.a., until the end of the subsequent Winter period, December through March. At that time, the average consumption of such Winter period multiplied by the same percentages as prescribed in Section 2.B.3.a. shall be used as the customer's first tier usage block. If, however, the Department is still not able to establish a first tier usage block with such Winter period, first tier usage block computations will be made by the Department in its sole discretion that are based on the customer's Winter use characteristics, site conditions, and all applicable best management practices for conservation approved by the Board of Water and Power Commissioners.

In no event shall the minimum first tier usage block be less than twenty-four (24) hundred cubic feet per month.

(2) If a customer's average consumption for the prior twelve (12) months is twenty-five percent (25%) or more above the established first tier usage block and the nature of use of the premises has or customer operations at the premises have significantly changed since the establishment of the first tier usage block, first tier usage block computations will be made by the Department in its sole discretion that are based on the customer's Winter use characteristics, site conditions, and all applicable best management practices for conservation approved by the Board of Water and Power Commissioners.

However, the minimum first tier usage block shall not be less than twenty-four (24) hundred cubic feet per month.

(3) If the Department certifies, after reviewing audit report findings regarding a customer's water conservation measures and results, that such customer has demonstrated implementation of key water conservation measures as established by the Board of Water and Power Commissioners to such a degree that opportunities to further reduce first tier consumption levels have already been exhausted, then, notwithstanding the first tier usage block reductions prescribed in Section 2.B.3.a., such customer's first tier usage block shall remain fixed at the level established upon the date of said certification without further first tier usage block reductions required.

C. SCHEDULE C - COMMERCIAL, INDUSTRIAL, AND GOVERNMENTAL CUSTOMERS AND TEMPORARY CONSTRUCTION

1. APPLICABILITY

Applicable to Commercial, Industrial, Governmental, and Temporary Construction water service and any other water service for which no rate schedule is specified.

2. TERRITORY

City of Los Angeles.

3. COMMODITY CHARGES

Rate Per Hundred Cubic Feet

a. First Tier Usage Block
Usage in first tier usage block shall be billed as follows:

Effective Effective Date	$1.422 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2016	$1.792 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2017	$1.999 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$2.016 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$2.095 and General Provision F, G, H, K, L, R, and S adjustments

The Low Season first tier usage block shall be the higher of one hundred percent (100%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or one hundred percent (100%) of the average consumption for the period of December 2014 through March 2015.

The High Season first tier usage block shall be the higher of one hundred five percent (105%) of the customer's adjusted first tier usage block as of the day prior to the Effective Date or one hundred five percent (105%) of the average consumption for the period of December 2014 through March 2015.

b. Second Tier Usage
Usage above the first tier usage block shall be billed as follows:

Effective Effective Date	$2.923 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2016	$3.292 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2017	$3.500 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$3.516 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$3.595 and General Provision F, G, H, K, L, R, and S adjustments

4. BILLING

The bill shall be the sum of the charges for first tier usage, including adjustments to first tier usage pursuant to General Provisions F, G, H, K, L, R, and S, and charges for any second tier usage, including adjustments to second tier usage pursuant to General Provisions F, G, H, K, L, R, and S.

5. SPECIAL CONDITIONS

a. Service Inside the City of Los Angeles
Charges for water service to premises of which ninety percent (90%) or more of the area is inside the City shall be the amount computed at the rates set forth above.

b. Service Outside the City of Los Angeles
Charges for water service to premises of which less than ninety percent (90%) of the area is inside the City shall also include a surcharge equal to the differential cost of treated Tier II water delivered to the City purchased from the Metropolitan Water District and the average cost of water delivered to the City through the Los Angeles Aqueducts for the previous five years. However, at no time shall the rates be less than those charged for service inside the City.

c. Applicability of Rules and Regulations
Application of this schedule shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

d. Special First Tier Usage Block Conditions
(1) If a customer has not established a first tier usage block as prescribed above, the customer shall pay the first tier Commodity Charges in effect, including adjustments pursuant to the General Provisions, as prescribed in Section 2.C.3.a., until the end of the subsequent Winter period, December through March. At that time, the average consumption of such Winter period multiplied by the same percentages as prescribed in Section 2.C.3.a. shall be used as the customer's first tier usage block for the Low Season and High Season, respectively. If, however, the Department is still not able to establish a first tier usage block with such Winter period, first tier usage block computations for the Low Season and High Season will be made by the Department in its sole discretion that are based on the customer's Winter use characteristics, site conditions, and all applicable best

management practices for conservation approved by the Board of Water and Power Commissioners.

(2) If a customer's average Low Season consumption is twenty-five percent (25%) or more above the established Low Season first tier usage block and the nature of use of the premises has or customer operations at the premises have significantly changed since the establishment of the Low Season first tier usage block, first tier usage block computations for Low Season and High Season will be made by the Department in its sole discretion that are based on the customer's Winter use characteristics, site conditions, and all applicable best management practices for conservation approved by the Board of Water and Power Commissioners.

D. SCHEDULE D - RECYCLED WATER SERVICE

1. APPLICABILITY

Applicable to all retail recycled water service and to wholesale recycled water service when specifically authorized by the Board of Water and Power Commissioners.

2. TERRITORY

City of Los Angeles.

3. COMMODITY CHARGES

Commodity Charges for Recycled Water Service shall be set by contract approved by the Board of Water and Power Commissioners.
The Board of Water and Power Commissioners has entered into contracts for delivery of recycled water wherein the commodity charge for recycled water was set at a rate equal to eighty percent (80%) of the commodity charge of the general applicable in-city potable water rate. (Schedule G in Ordinance No. 167554.) For purposes of the commodity charge for recycled water in existing contracts for the sale of recycled water, the commodity charge in Section 2.A.3.a. shall be the general applicable in-city potable water rate.

4. ADJUSTMENTS AND SUBSIDIES

Adjustments provided in General Provisions F, G, H, K, L, R, and S and subsidies as set forth in the General Provisions O and P shall not apply to this schedule.

5. BILLING

The bill shall be the sum of the Commodity Charges and the Treatment Surcharge.

6. SPECIAL CONDITIONS

a. Service Inside the City of Los Angeles
Charges for water service to premises of which ninety percent (90%) or more of the area is inside the City shall be set by separate contract approved by the Board of Water and Power Commissioners.

b. Service Outside the City of Los Angeles
Charges for water service to premises of which less than ninety percent (90%) of the area is inside the City shall be set by separate contract approved by the Board of Water and Power Commissioners.

c. Treatment Surcharge
The cost of treatment of recycled water prior to delivery beyond that required to discharge the wastewater to the ocean or a stream may be determined by the Department and added to the Commodity Charges as a Treatment Surcharge. However, except for Advanced Treated Recycled Water, the sum of such Surcharge and the Commodity Charges shall not exceed the Commodity Charges in effect under Section 2.A.3.a., excluding adjustments pursuant to the General Provisions F, G, H, K, L, R, and S.

d. Obligation to Supply Recycled Water
The Department will provide recycled water service under this schedule only when and where such water is available and can be supplied at a reasonable cost. In determining reasonable cost, the Department may consider all relevant factors, including, but not limited to, the present and projected costs of supplying potable domestic water to affected greenbelt areas and the present and projected costs of supplying recycled water. Grants or subsidies may be used to reduce total development costs.

e. Continuity of Service and Water Quality
There is no implication of continuous service or uniform quality of recycled water; therefore, the customer must have a separate service connection for potable water.

f. Wholesale Recycled Water Service
Wholesale Service may be provided to other water agencies consistent with the City Charter, but only under this schedule, or a separate contract, when approved by the Board of Water and Power Commissioners.

g. Special Uses
The Board of Water and Power Commissioners may establish special charges by contract under particular conditions for temporary, demonstrative, recreational or research uses.

h. Applicability of Rules and Regulations
Application of this schedule shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

E. SCHEDULE E - PRIVATE FIRE SERVICE

1. APPLICABILITY

Applicable to water service solely for private fire suppression purposes.

2. TERRITORY

City of Los Angeles.

3. MONTHLY CHARGES

a. Service Availability Charge

Charge per Service

Size of Service	Effective Effective Date	Effective July 1, 2016	Effective July 1, 2017	Effective July 1, 2018	Effective July 1, 2019
1-inch and smaller	$ 3.15	$ 3.20	$ 3.26	$ 3.33	$ 3.39
1-1/2 inch	$ 11.18	$ 11.35	$ 11.57	$ 11.80	$ 12.04
2-inch	$ 15.88	$ 16.13	$ 16.44	$ 16.77	$ 17.10
3-inch	$ 39.11	$ 39.73	$ 40.49	$ 41.30	$ 42.12
4-inch	$ 62.33	$ 63.33	$ 64.53	$ 65.82	$ 67.14
6-inch	$ 110.22	$ 111.98	$ 114.11	$ 116.39	$ 118.72
8-inch	$ 215.79	$ 219.24	$ 223.41	$ 227.87	$ 232.43
10-inch	$ 259.88	$ 264.04	$ 269.06	$ 274.44	$ 279.93
12-inch	$ 334.13	$ 339.48	$ 345.93	$ 352.85	$ 359.90
14-inch	$ 519.77	$ 528.08	$ 538.12	$ 548.88	$ 559.85
16-inch	$ 621.86	$ 631.81	$ 643.82	$ 656.69	$ 669.83
20-inch	$ 834.17	$ 847.51	$ 863.62	$ 880.89	$ 898.51

b. Commodity Charges

	Rate Per Hundred Cubic Feet
Effective Effective Date	$1.422 and General Provision F, G, H, K, L, R, and S adjustments

Effective July 1, 2016	$1.792 and General Provision F, G, H,K, L, R, and S adjustments
Effective July 1, 2017	$1.999 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2018	$2.016 and General Provision F, G, H, K, L, R, and S adjustments
Effective July 1, 2019	$2.095 and General Provision F, G, H, K, L, R, and S adjustments

4. BILLING

The bill shall be the sum of the Service Availability Charge and the Commodity Charges, including adjustments pursuant to General Provisions F, G, H, K, L, R, and S.

5. SPECIAL CONDITIONS

a. Partial Metering
Service under this schedule shall not be fully metered, but shall be equipped with a meter in a bypass and weighted valve mechanism for diverting small flows through the bypass meter.

b. Termination and Restoration of Service
Service under this schedule shall be terminated by the Department if water supplied under this schedule is used for any purpose other than fire extinguishing and for filling or refilling the customers' fire-related facilities which have been drained during tests and repairs. Service shall thereafter be restored only after a meter has been installed, after which service shall be supplied at applicable metered rates.

c. Service Availability Charges for Fire Services
For the purpose of computing service availability charges, the size of service shall be determined by the Department.

d. Applicability of Rules and Regulations

Application of this schedule shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

F. SCHEDULE F - PUBLICLY-SPONSORED IRRIGATION; RECREATIONAL; AGRICULTURAL, HORTICULTURAL, AND FLORICULTURAL USES; COMMUNITY GARDENS AND YOUTH SPORTS

1. APPLICABILITY

Applicable to water service provided exclusively for the following uses:

a. Group A Uses
   (1) Agricultural, horticultural, and floricultural uses on property that is dedicated for public use, operated on a nonprofit basis and open to the general public.
   (2) Landscaping on grounds contiguous to buildings that are dedicated exclusively for public use and are operated on a nonprofit basis.
   (3) Irrigation on grounds used exclusively by nonprofit educational institutions that are open to the general public.

To qualify, all Group A uses must be on areas that are not less than three (3) acres in size, exclusive of streets, sidewalks, alleys, and lands occupied by buildings.

b. Group B Uses
   (1) Irrigating parcels of land used exclusively for commercial production of agricultural, horticultural or floricultural products in conformance with recognized practices of husbandry.
   (2) Irrigating playing fields used for youth sports, including any sport recognized by the Amateur Athletic Union that requires a playing field, that are operated by nonprofit organizations solely for the purpose of providing youth sports for children in grades K through 12 who are residents of the City of Los Angeles, and participation in the sport is open to the general public.

To qualify, all Group B uses must be on areas that are not less than five (5) acres in size.

c. Group C Uses

Irrigating parcels of land used exclusively for community gardens growing agricultural products for human consumption, operated by community garden organizations that solely serve residents of the City of Los Angeles, on publicly-owned land or land donated for public use, in accordance with rules and regulations adopted by the Board of Water and Power Commissioners.

d. Group D Uses
Uses in parks, playgrounds, golf courses and lakes that are dedicated exclusively for public recreational uses, open to the general public, and operated on a nonprofit basis.

e. Group E Uses
Irrigation in medians in public streets that have complied with best management practices for medians as approved by the Board of Water and Power Commissioners.

2. TERRITORY

City of Los Angeles.

3. COMMODITY CHARGES

a. First Tier Usage Block
Usage in first tier usage block shall be billed as follows:

	Rate Per Hundred Cubic Feet
Effective Effective Date	$2.108 (Includes $1.422 Base Rate)
Effective July 1, 2016	$2.831 (Includes $1.792 Base Rate)
Effective July 1, 2017	$3.498 (Includes $1.999 Base Rate)
Effective July 1, 2018	$4.363 (Includes $2.016 Base Rate)
Effective July 1, 2019	$2.095 and General Provision F, G, H, K, L, R, and S adjustments

Monthly first tier usage blocks shall be established by the Department for domestic water use and landscape and large area irrigation prescribed in this Schedule F after an audit has been completed, considering site conditions and based upon best management practices approved by the Board of Water and Power Commissioners, and shall be subject to periodic review and revision by the Department.

b. Second Tier Usage
Usage above the first tier usage block shall be billed as follows:

	Rate Per Hundred Cubic Feet
Effective Effective Date	$6.780 (Includes $2.923 Base Rate)
Effective July 1, 2016	$8.257 (Includes $3.292 Base Rate)
Effective July 1, 2017	$8.183 (Includes $3.500 Base Rate)
Effective July 1, 2018	$8.433 (Includes $3.516 Base Rate)
Effective July 1, 2019	$3.595 and General Provision F, G, H, K, L, R, and S adjustments

4. BILLING

a. The bill shall be the sum of the charges for first tier usage, including adjustments to first tier usage pursuant to General Provisions F, G, H, K, L, R, and S where specified, and charges for any second tier usage, including adjustments to second tier usage pursuant to General Provisions F, G, H, K, L, R, and S where specified.

b. Through June 30, 2019, the revenue billed to Schedule F customers that is attributable to the difference between the Schedule F rate and its Base Rate component as recorded semiannually shall be proportionately allocated to the adjustments in General Provision F, G, H, K, L, R, and S according to those adjustments' respective shares when calculated without such revenue.

5. SPECIAL CONDITIONS

a. Application
A written application shall be required for each location at which water is delivered under this schedule.

b. Separate Service for Buildings
Service under this schedule shall be provided for irrigation and landscaping purposes; however, service to buildings shall be provided separately at rates specified in Schedule C, except Group D uses as prescribed in Section 2.F.1.d. above.

c. Recycled Water
Customers receiving service under Schedule F shall be required to utilize recycled water, when available. Customers utilizing recycled water due to this requirement shall continue to be billed under this Schedule unless they choose to be billed under Schedule D. If the recycled water is available to a customer but not utilized, such a customer shall be billed under Schedule C.

d. Applicability of Rules and Regulations

(1) Application of this schedule shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

(2) A community garden organization applying for Group C use must satisfy the Department that it is capable of paying the charges for its water service, that it is an organization primarily formed to operate a community garden solely serving residents of the City, and that it has appropriate permission to use public land or land donated for public use.

(3) Customers applying for Group B (1) use must satisfy the Department that they are a bona fide business as defined by the Internal Revenue Code, and that the area served is used exclusively for commercial production of agricultural, floricultural or horticultural products. This schedule is not applicable to "hobby" businesses.

(4) Customers applying for Group D uses that include domestic water service must comply with best management practices for water using appliances and fixtures approved by the Board of Water and Power Commissioners.

e. Service Inside the City of Los Angeles
Charges for water service to premises of which ninety percent (90%) or more of the area is inside the City shall be the amount computed at the rates set forth above.

f. Service Outside the City of Los Angeles
Charges for water service to premises of which less than ninety percent (90%) of the area is inside the City shall also include a

surcharge equal to the differential cost of treated Tier II water delivered to the City purchased from the Metropolitan Water District and the average cost of water delivered to the City through the Los Angeles Aqueducts for the previous five years. However, at no time shall the rates be less than those charged for service inside the City.

Sec. 3. That the general provisions relating to water and water service supplied under schedules prescribed herein are as follows:

GENERAL PROVISIONS

A. RATE APPLICABILITY AND RULES

The application, interpretation and administration of the provisions herein shall be subject to such rules as may from time to time be promulgated by the Board of Water and Power Commissioners pursuant to its power and duty to administer the affairs of the Department of Water and Power, and the application, interpretation and administration of said provisions and rules by said Board shall be final. Such rules as prescribed for application within the City of Los Angeles shall be considered applicable for service outside the City, except as may otherwise be provided by specific rules herein or hereafter prescribed by the Board.

B. SURPLUS WATER - PARAMOUNT RIGHT OF THE CITY OF LOS ANGELES

Only surplus water, owned or controlled by the City of Los Angeles and not required for use of customers served by the City within its limits, may be supplied or distributed outside the City. The supplying or distribution of such surplus water shall, in all cases, be subject to the paramount right of the City to discontinue it, in whole or in part, and to hold or distribute such surplus water for the use of the City and its inhabitants.

C. METERING

For the purpose of computing charges, each meter serving the customer's premises shall be considered separately, and readings of two or more meters will not be combined as equivalent to a measurement through one meter except when such combination is for the convenience of the Department.

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E. TIME AND MANNER OF PAYMENT OF BILLS

All bills for water service hereunder are due and payable upon presentation; bills shall become delinquent nineteen (19) days after date of presentation. If bills become delinquent, the Department may impose a Late Payment Charge and terminate the water service in accordance with applicable law or Department rules. Payment shall be made in person or by mail at offices of the Department, or at the option of the Department, to its authorized collectors.

F. WATER SUPPLY COST ADJUSTMENT

1. A Water Supply Cost Adjustment (WSCA) shall be included in the first and second tier rates as set forth in Schedules A, B, C, and F, in the third and fourth tier rates as set forth in Schedule A, and in the Schedule E rate; and shall be included in bills under each service schedule and any contract where it is so specified. The WSCA recovers Los Angeles Aqueduct (LAA), purchased water (PW), groundwater (GW), recycled water (RW), water conservation (WC), and any additional water supply source expenses through application of the Water Supply Cost Adjustment Factor (WSCAF) and may vary according to the tiers of customers' rates.

2. The WSCAF shall be calculated two times each year and shall take effect January 1 and July 1, respectively. The WSCAF shall also be calculated and take effect upon the Effective Date. The following estimated expenses, as approved by the Board of Water and Power Commissioners in advance for inclusion in the WSCAF, shall be included in the respective calculation of the WSCAF:

    (a) The estimated LAA expense for 12 months commencing with the effective date of the WSCAF. This expense shall include estimated depreciation expense, interest expense or equivalent, operating and maintenance expense, and property taxes, and shall be reduced by net revenue generated from the LAA facilities.

    (b) The estimated purchased water expense for 12 months commencing with the effective date of the WSCAF. This expense shall include the total cost to the Department of all water delivered to the Department's system, including, but not limited to, the cost of other services provided by water suppliers.

    (c) The estimated groundwater expense for 12 months commencing with the effective date of the WSCAF. This expense shall include estimated depreciation expense, interest expense or equivalent, and cost for operation and maintenance for in-City groundwater and related booster pumping.

    (d) The estimated recycled water expense for 12 months commencing with the effective date of the WSCAF. This expense shall include costs of purchasing recycled water and costs of producing recycled water, including capital expenditures, operating and maintenance expense, costs of stormwater capture and aquifer recharge, and debt service for facilities and systems, including pipelines and pumping and treatment stations, which are part of the Department's water recycling projects and programs.

(e) The estimated water conservation expense for 12 months commencing with the effective date of the WSCAF. This expense shall include costs for assets not securitized and that are incurred for customer technical assistance, customer financial incentives and the acquisition and installation of devices and systems, including low-flush toilets and low-flow shower heads, and operating and maintenance expense, which are part of those programs or projects designed to reduce the use of water.

(f) The estimated expense for 12 months commencing with the effective date of the WSCAF of any additional source of water supply not described herein.

3. The Unit Price for each water supply source in the WSCAF calculation shall be calculated as follows:

(a) $$\text{Price for LAA} = \frac{\text{LAA expense from Sec. 3.F.2.(a)}}{\text{LAA production units}}$$

(b) $$\text{Price for PW} = \frac{\text{PW expense from Sec. 3.F.2.(b)}}{\text{PW production units}}$$

(c) $$\text{Price for GW} = \frac{\text{GW expense from Sec. 3.F.2.(c)}}{\text{GW production units}}$$

(d) $$\text{Price for RW} = \frac{\text{RW expense from Sec. 3.F.2.(d)}}{\text{RW production units}}$$

(e) $$\text{Price for additional source(s)} = \frac{\text{expense from Sec. 3.F.2.(f) for a source}}{\text{production units of that source}}$$

(f) $$\text{Price for WC} = \frac{\text{WC expense from Sec. 3.F.2(e)}}{\text{Retail Sales}}$$

(g) $$\text{Unit Cost for Over/(Under) Balancing} = \frac{\text{Water Supply Cost Adjustment Account from Sec. 3.F.6}}{\text{Retail Sales}}$$

Where: production units of each supply source are estimated production in HCF, net of loss, for 12 months commencing with the effective date of WSCAF, and Retail Sales are the estimated retail water sales in HCF for 12 months commencing with the effective date of the WSCAF, less

Schedule D and F sales but only excluding Schedule F sales through June 30, 2019.

4. The WSCAF that will be applied to a particular tier of a customer's usage is calculated based on sources of supply, beginning with the first tier and continuing in numerical order. A tier's expected annual demand is supplied starting with the least expensive available source and continuing in order with the next more expensive available source until that tier's expected annual demand is met.

S1 = lowest cost supply source
S2 = next higher cost supply source
S3 = next higher cost supply source
S4 = next higher cost supply source
Sn = next supply source(s) with the highest cost
(i.e., S5, S6, or S7 for fifth, sixth, or seventh supply source, respectively, and so on until no sources remain)

5. The WSCAF formula for each tier, expressed to the nearest $0.001 per HCF, is:

A – First Tier (T1) Demand **B – Second Tier (T2) Demand**
C – Third Tier (T3) Demand **D – Fourth Tier (T4) Demand**
SP – unit price of the water supply source (i.e., SP1 for unit price for lowest cost supply source and SPn is the unit price of the next supply source(s) with the highest cost)

$$\mathbf{T1} = \frac{\text{S1 to meet }\textbf{A}\text{ x SP1}}{\mathbf{A}} + \frac{\text{S2 for unmet }\textbf{A}\text{ by S1 x SP2}}{\mathbf{A}} + \frac{\text{S3 for unmet A by S1,2 x SP3}}{\mathbf{A}} + \frac{\text{S4 for unmet }\textbf{A}\text{ by S1,2,3 x SP4}}{\mathbf{A}} +$$

$$\frac{\text{Sn for unmet }\textbf{A}\text{ by S1-4,etc. x SPn}}{\mathbf{A}} + \text{Sec. 3.F.3.(f)} + \text{Sec. 3.F.3.(g)}$$

$$\mathbf{T2} = \frac{\text{S1 to meet }\textbf{B}\text{ x SP1}}{\mathbf{B}} + \frac{\text{S2 for unmet }\textbf{B}\text{ by S1 x SP2}}{\mathbf{B}} + \frac{\text{S3 for unmet }\textbf{B}\text{ by S1,2 x SP3}}{\mathbf{B}} + \frac{\text{S4 for unmet }\textbf{B}\text{ by S1,2,3 x SP4}}{\mathbf{B}} +$$

$$\frac{\text{Sn for unmet }\textbf{B}\text{ by S1-4,etc. x SPn}}{\mathbf{B}} + \text{Sec. 3.F.3.(f)} + \text{Sec. 3.F.3.(g)}$$

$$\mathbf{T3} = \frac{\text{S1 to meet } \mathbf{C} \text{ x SP1}}{\mathbf{C}} + \frac{\text{S2 for unmet } \mathbf{C} \text{ by S1 x SP2}}{\mathbf{C}} +$$

$$\frac{\text{S3 for unmet } \mathbf{C} \text{ by S1,2 x SP3}}{\mathbf{C}} + \frac{\text{S4 for unmet } \mathbf{C} \text{ by S1,2,3 x SP4}}{\mathbf{C}} +$$

$$\frac{\text{Sn for unmet } \mathbf{C} \text{ by S1-4,etc. x SPn}}{\mathbf{C}} + \text{Sec. 3.F.3.(f)} + \text{Sec. 3.F.3.(g)}$$

$$\mathbf{T4} = \frac{\text{S1 to meet } \mathbf{D} \text{ x SP1}}{\mathbf{D}} + \frac{\text{S2 for unmet } \mathbf{D} \text{ by S1 x SP2}}{\mathbf{D}} +$$

$$\frac{\text{S3 for unmet } \mathbf{D} \text{ by S1,2 x SP3}}{\mathbf{D}} + \frac{\text{S4 for unmet } \mathbf{D} \text{ by S1,2,3 x SP4}}{\mathbf{D}} +$$

$$\frac{\text{Sn for unmet } \mathbf{D} \text{ by S1-4,etc. x SPn}}{\mathbf{D}} + \text{Sec. 3.F.3.(f)} + \text{Sec. 3.F.3.(g)}$$

6. A Water Supply Cost Adjustment Account shall be maintained by the Department on a semiannual basis. Entries to this account shall include:

(a) An amount equal to the qualified LAA expenses identified in Section 3.F.2.(a) as recorded semiannually.

(b) An amount equal to the qualified purchased water expenses identified in Section 3.F.2.(b) as recorded semiannually.

(c) An amount equal to the qualified groundwater expenses identified in Section 3.F.2.(c) as recorded semiannually.

(d) An amount equal to the qualified recycled water expenses identified in Section 3.F.2.(d) as recorded semiannually.

(e) An amount equal to the qualified water conservation expenses identified in Section 3.F.2.(e) as recorded semiannually.

(f) An amount equal to the qualified additional water supply source expenses identified in Section 3.F.2.(f) as recorded semiannually.

(g) An amount equal to the uncollectible WSCA portion of customer water bills as recorded semiannually.

(h) Less: An amount equal to revenue billed at the first, second, third and fourth tier rates that is attributable to the WSCAF as recorded semiannually.

(i) Less: Through June 30, 2019, an amount equal to revenue billed to Schedule F customers that is allocated to the WSCA as recorded semiannually.

(j) Less: An amount equal to revenue billed to Schedule D customers as recorded semiannually.

(k) On the Effective Date, an amount equal to the sum of the balances of the Purchased Water Adjustment Account and Demand Side Management and Reclaimed Water Cost Adjustment Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended.

7 Special Condition

In the event securitization of assets is not feasible, the limitation in Section 3.F.2.(e) to assets not securitized is deleted, and the Department may fund all qualifying water conservation expenses through borrowing up to the percentage specified in the capitalization ratio approved by the Board of Water and Power Commissioners.

G. WATER QUALITY IMPROVEMENT ADJUSTMENT

1. A Water Quality Improvement Adjustment (WQIA) shall be included in the first and second tier rates as set forth in Schedules A, B, C, and F, in the third and fourth tier rates as set forth in Schedule A, and in the Schedule E rate; and shall be included in bills under each service schedule and any contract where it is so specified. The WQIA recovers water quality related expense in order to equalize water quality throughout the City, to meet State and Federal water quality standards, and to provide security for water supply, storage, and conveyance infrastructure and related facilities through application of the Water Quality Improvement Adjustment Factor.

2. The Water Quality Improvement Adjustment Factor (WQIAF) shall be calculated two times each year and shall take effect January 1 and July 1, respectively. The WQIAF shall also be calculated and take effect upon the Effective Date.

The WQIAF formula, expressed to the nearest $0.001 per HCF, is:

$$\text{WQIAF} = \frac{(a)+(b)}{(c)}$$

Where:

(a) is the estimated water quality related expense for 12 months commencing with the effective date of the WQIAF. This expense shall include costs for assets not securitized and that are incurred for capital expenditures, operating and maintenance expense, and debt service associated with construction, equipment, supplies, groundwater treatment for potable use, and facilities and systems, including filtration and water treatment, cement lining, disinfection, reservoir improvements, monitoring equipment, pipelines, and conduits, which are part of those programs and projects designed to equalize the quality of water throughout the City, to meet State and Federal mandated water quality standards, or to provide security for water supply, storage, and conveyance infrastructure and related facilities, which expense has been approved in advance by the Board of Water and Power Commissioners to be included in the WQIAF.

(b) is the balance in the WQIA Account.

(c) is the estimated retail water sales in HCF for 12 months commencing with the effective date of the WQIAF, less Schedule D and F sales but only excluding Schedule F sales through June 30, 2019.

3. A Water Quality Improvement Adjustment Account shall be maintained by the Department on a semiannual basis. Entries to this account shall include:

(a) An amount equal to the qualified water quality related expenses identified in Section 3.G.2.(a) as recorded semiannually.

(b) An amount equal to the uncollectible WQIA portion of customer water bills as recorded semiannually.

(c) Less: An amount equal to revenue billed at the first, second, third and fourth tier rates that is attributable to the WQIAF as recorded semiannually.

(d) Less: Through June 30, 2019, an amount equal to revenue billed to Schedule F customers that is allocated to the WQIAF as recorded semiannually.

(e) On the Effective Date, an amount equal to the sum of the balances of the Water Quality Improvement Adjustment Factor and the Water

Security Adjustment Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended.

4. Special Condition

In the event securitization of assets is not feasible, the limitation in Section 3.G.2.(a) to assets not securitized is deleted, and the Department may fund all qualifying water quality related expenses through borrowing up to the percentage specified in the capitalization ratio approved by the Board of Water and Power Commissioners.

H. BASE RATE REVENUE TARGET ADJUSTMENT

1. A Base Rate Revenue Target Adjustment (BRRTA) recovers any shortage in revenue from Base Rates or credits back any excess collection of revenue from Base Rates due to variation in water sales from projections through application of the Base Rate Revenue Target Adjustment Factor (BRRTAF). Base Rate Revenue Targets (BRRT) for revenue from Base Rates of Schedule A, Schedule B, and the combination of all other rate schedules (Others) are established for the following fiscal years commencing on July 1:

2.

($ in Millions)	**Schedule A**	**Schedule B**	**Others**
Fiscal Year 15/16	$134.4	$101.7	$106.1
Fiscal Year 16/17	$175.7	$137.7	$122.7
Fiscal Year 17/18	$195.9	$153.6	$136.5
Fiscal Year 18/19	$197.5	$154.8	$138.0
Fiscal Year 19/20	$204.8	$160.6	$142.5

Any of the BRRTs for Fiscal Year 2018/19 and Fiscal Year 2019/20 stated above could be increased or decreased by the Board of Water and Power Commissioners in accordance with Section 4 of this ordinance. For Fiscal Year 2020/21, and fiscal years thereafter, commencing on July 1, BRRTs for Schedule A, Schedule B, and Others shall be established by the Board of Water and Power Commissioners by resolution prior to the start of the respective fiscal year. The increase in percentage of any BRRT established by the Board of Water and Power Commissioners from the prior period's BRRT shall not exceed the percentage change, year over year, of the second quarter's seasonally adjusted Gross Domestic Product Implicit Price Deflator (GDPDEF), as published by the U.S. Department of Commerce Bureau of Economic Analysis, using 2009 as the reference base, for the calendar year preceding the fiscal year for which the BRRT is being established, less two percent (2%), but the net amount shall in no event be less than zero. The approved BRRT shall be communicated to the City Council.

2. The BRRTAF shall be calculated once each year and take effect January 1. The BRRTAF shall also be calculated and take effect upon the Effective Date. The BRRTAF shall be calculated separately for Schedule A, Schedule B, and Others.

The BRRTAF formula for Schedule A, expressed to the nearest $0.001 per HCF, is:

$$\text{BRRTAF}_{\text{A}} = \frac{\text{(a)}}{\text{(b)}}$$

Where:

(a) is the balance in the BRRTA Account for Schedule A.

(b) is the estimated retail water sales in HCF for Schedule A for 12 months commencing with the effective date of the BRRTAF, provided, however, on the Effective Date and on January 1, 2017, is the estimated retail water sales in HCF for Schedule A for 24 months commencing with the effective date of the BRRTAF.

The BRRTAF formula for Schedule B, expressed to the nearest $0.001 per HCF, is:

$$\text{BRRTAF}_{\text{B}} = \frac{\text{(a)}}{\text{(b)}}$$

Where:

(a) is the balance in the BRRTA Account for Schedule B.

(b) is the estimated retail water sales in HCF for Schedule B for 12 months commencing with the effective date of the BRRTAF, provided, however, on the Effective Date and on January 1, 2017, is the estimated retail water sales in HCF for Schedule B for 24 months commencing with the effective date of the BRRTAF.

The BRRTAF formula for Others, expressed to the nearest $0.001 per HCF, is:

$$\text{BRRTAF}_{\text{Others}} = \frac{\text{(a)}}{\text{(b)}}$$

Where:

(a) is the balance in the BRRTA Account for Others.

(b) is the estimated retail water sales in HCF for Others for 12 months commencing with the effective date of the BRRTAF, less Schedules D and F sales but only excluding Schedule F sales through June 30, 2019; provided, however, on the Effective Date and on January 1, 2017, is the estimated retail water sales in HCF for Others for 24 months commencing with the effective date of the BRRTAF, less Schedules D and F sales.

3. A BRRTA Account shall be maintained for Schedule A by the Department on an annual basis. Entries to this account shall include:

(a) Except on the Effective Date, an amount equal to the Base Rate Revenue Target of the prior fiscal year for Schedule A less the actual Base Rates revenue received by the Department from Schedule A customers for that fiscal year.

(b) Except on the Effective Date, an amount equal to the uncollectible BRRTA portion of Schedule A customer water bills as recorded for that fiscal year.

(c) On the Effective Date, an amount equal to the balance of the Water Revenue Adjustment Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended, attributable to Schedule A.

4. A BRRTA Account shall be maintained for Schedule B by the Department on an annual basis. Entries to this account shall include:

(a) Except on the Effective Date, an amount equal to the Base Rate Revenue Target of the prior fiscal year for Schedule B less the actual Base Rates revenue received by the Department from Schedule B customers for that fiscal year.

(b) Except on the Effective Date, an amount equal to the uncollectible BRRTA portion of Schedule B customer water bills as recorded for that fiscal year.

(c) On the Effective Date, an amount equal to the balance of the Water Revenue Adjustment Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended, attributable to Schedule B.

5. A BRRTA Account shall be maintained for Others by the Department on an annual basis. Entries to this account shall include:

(a) Except on the Effective Date, an amount equal to the Base Rate Revenue Target of the prior fiscal year for Others less the actual Base Rates revenue received by the Department from Others for that fiscal year.

(b) Except on the Effective Date, an amount equal to the uncollectible BRRTA portion of water bills for Others as recorded for that fiscal year.

(c) Less: Through June 30, 2019, except on the Effective Date, an amount equal to revenue billed to Schedule F customers that is allocated to the BRRTA as recorded semiannually.

(d) On the Effective Date, an amount equal to the balance of the Water Revenue Adjustment Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended, attributable to Others.

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K. OWENS VALLEY REGULATORY ADJUSTMENT

1. An Owens Valley Regulatory Adjustment (OVRA) shall be included in the first and second tier rates as set forth in Schedules A, B, C, and F, in the third and fourth tier rates as set forth in Schedule A, and in the Schedule E rate; and shall be included in bills under each service schedule and any contract where it is so specified. OVRA recovers expense for the Owens Lake Dust Mitigation Program, the Lower Owens River Project, and the Owens Lake Master Project through application of the Owens Valley Regulatory Adjustment Factor.

2. The Owens Valley Regulatory Adjustment Factor (OVRAF) shall be calculated two times each year and shall take effect January 1 and July 1, respectively. The OVRAF shall also be calculated and take effect upon the Effective Date.

The OVRAF formula, expressed to the nearest $0.001 per HCF, is:

$$\text{OVRAF} = \frac{(a)+(b)}{(c)}$$

Where:

(a) is the estimated Owens Valley regulatory expense for 12 months commencing with the effective date of the OVRAF. This expense shall include costs for assets not securitized and that are incurred for capital expenditures, operating and maintenance expense, and debt service associated with infrastructure and related facilities, which are a part of the Owens Lake Dust Mitigation Program, the Lower Owens River Project, and the Owens Lake Master Project, which expense has been approved in advance by the Board of Water and Power Commissioners to be included in the OVRAF.

(b) is the balance in the OVRA Account.

(c) is the estimated retail water sales in HCF for twelve months commencing with the effective date of the OVRAF, less Schedule D and Schedule F but only excluding Schedule F sales through June 30, 2019.

3. An Owens Valley Regulatory Adjustment Account shall be maintained by the Department on a semiannual basis. Entries to this account shall include:

(a) An amount equal to the qualified Owens Valley regulatory expenses identified in Section 3.K.2.(a) as recorded semiannually.

(b) An amount equal to the uncollectible OVRA portion of customer water bills as recorded semiannually.

(c) Less: An amount equal to revenue billed at the first, second, third, and fourth tier rates that is attributable to the OVRAF as recorded semiannually.

(d) Less: Through June 30, 2019, an amount equal to revenue billed to Schedule F customers that is allocated to the OVRAF as recorded semiannually.

(e) On the Effective Date, an amount equal to the balance of the OVRA Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended.

4. Special Condition

In the event securitization of assets is not feasible, the limitation in Section 3.K.2.(a) to assets not securitized is deleted, and the Department may fund all qualifying Owens Valley regulatory expenses through borrowing up to the percentage specified in the capitalization ratio approved by Board of Water and Power Commissioners.

L. LOW-INCOME SUBSIDY ADJUSTMENT

1. A Low-Income Subsidy Adjustment (LISA) shall be included in the first and second tier rates as set forth in Schedules A, B, C, and F, in the third and fourth tier rates as set forth in Schedule A, and in the Schedule E rate except for those customers qualified for lifeline and low-income subsidy credits. The LISA recovers the cost of credits provided to lifeline and low-income customers as provided in General Provisions O and P through application of the Low-Income Subsidy Adjustment Factor.

2. The Low-Income Subsidy Adjustment Factor (LISAF) shall be calculated two times each year and shall take effect January 1 and July 1, respectively. The LISAF shall also be calculated and take effect upon the Effective Date.

   The LISAF formula, expressed to the nearest $0.001 per HCF, is:

$$\text{LISAF} = \frac{(a)+(b)+(c)}{(d)}$$

   Where:

   (a) is the estimated cost of lifeline and low-income credit as provided in General Provisions O and P for 12 months commencing with the effective date of the LISAF.

   (b) is the estimated administrative cost related to water low-income and lifeline programs for 12 months commencing with the effective date of the LISAF.

   (c) is the balance in the LISA Account.

   (d) is the estimated retail water sales in HCF for 12 months commencing with the effective date of the LISAF, less Schedule D, Schedule F, and low-income and lifeline customer sales but only excluding Schedule F sales through June 30, 2019.

3. A Low-Income Subsidy Adjustment Account shall be maintained by the Department on a semiannual basis. Entries to this account shall include:

   (a) An amount equal to the cost of credits for lifeline and low-income customers provided in General Provisions O and P as recorded semiannually.

(b) An amount equal to the administrative cost for the lifeline and low-income programs as recorded semiannually.

(c) Less: An amount equal to revenue billed at the first, second, third and fourth tier rates that is attributable to the LISAF as recorded semiannually.

(d) Less: Through June 30, 2019, an amount equal to revenue billed to Schedule F customers that is allocated to the LISA as recorded semiannually.

(e) On the Effective Date, an amount equal to the balance of the LISA Account of the City of Los Angeles Water Rate Ordinance No. 170435, as amended.

4. Special Condition

The LISAF shall be calculated as set forth above, but no increase of the adjustment from the prior period's adjustment shall exceed $0.030 per billing unit.

M. LARGE IRRIGATED TURF

Those customers with 3 acres or more of turf on a single premises that are served from services providing water exclusively for landscape, except those customers receiving water under Schedule A or Schedule F, shall be entitled to receive ninety-five percent (95%) of their water usage at their first tier rate provided they have first completed an audit of their water use in their premises in accordance with a Department approved manual on large turf water audits and have implemented the "Best Management Practices for Turf Irrigation" as approved by the Board of Water and Power Commissioners to the satisfaction of the Department.

N. SEASONAL VARIATION ADJUSTMENTS

Schedule B and C customers that have 26 or more billing units of consumption above their first tier usage block and who also have a consumption above two hundred percent (200%) of their average consumption for the months of December through March for each of two consecutive billing periods during the High Season shall upon a showing by a customer that the customer has achieved the maximum practical reduction in water consumption by installation and use of generally acceptable water conserving devices and methods and in the customer's use of water be entitled to have their first tier usage block increased to a level that causes five percent (5%) of the customer's consumption to be considered above their first tier usage block for that year's High Season.

O. LIFELINE CUSTOMER SUBSIDY

Applicable to Schedule A residential water customers who are eligible for exemption from the City Utility User's Tax under provisions of Section 21.1.12(a) of the Los Angeles Municipal Code. Eligible customers shall receive a fixed $10.00 per month subsidy credit, except that such credit shall not exceed the customer's bill for water service. Eligible customers who elect to receive the subsidy under General Provision O shall not receive any subsidy under General Provision P.

P. LOW-INCOME SUBSIDY

Applicable to Schedule A residential water customers and residential customers submetered in accordance with General Provision T whose total household income does not exceed the limits established by the Board of Water and Power Commissioners. The customer must not be listed as a dependent on another person's income tax return and must use this service in the customer's primary residence only.

A qualified customer shall receive a monthly base subsidy credit of $5.00 per month, which shall be increased by $1.00 per month for each occupant of the dwelling unit in excess of 3 occupants. The credit shall not exceed a maximum of $10.00 per month, and shall not exceed the customer's bill for water service.

A person who is a residential customer of record of the Power System or receives Schedule R-3 submetered residential electric service, but who is not a Schedule A residential customer of the Water System, is eligible for the Low-Income Subsidy if such customer's income does not exceed the income limits established by the Board of Water and Power Commissioners for eligibility for such subsidy. The amount of the Low-Income Subsidy credit shall be as set forth above, and shall be applied against the customer's electric bill after first applying any credit adjustments or subsidy pursuant to the electric rate ordinance; provided, however, the Low-Income Credit shall not exceed the amount of the customer's bill for electric service.

To make the Power Revenue Fund whole, the Board shall cause transfers of funds from the Water Revenue Fund to the Power Revenue Fund equal in amounts to the Low-Income Subsidy credits that have been allowed to customers on their electric service bills according to the terms of this provision. The Board of Water and Power Commissioners shall make such transfers at such times as it deems financially prudent so as to make the Power Revenue Fund whole.

Q. INTENTIONALLY LEFT BLANK

R. WATER INFRASTRUCTURE ADJUSTMENT

1. The Water Infrastructure Adjustment (WIA) shall be included in the first and second tier rates as set forth in Schedules A, B, C, and F, in the third and fourth tier rates as set forth in Schedule A, and in the Schedule E rate; and shall be included in bills under each service schedule and any contract where it is so specified. The WIA recovers capital costs associated specifically with infrastructure investments to maintain and improve the reliability of the water distribution system through application of the Water Infrastructure Adjustment Factor.

2. The Water Infrastructure Adjustment Factor (WIAF) shall be calculated once each year and shall take effect July 1. The WIAF shall also be calculated and take effect upon the Effective Date.

   The WIAF formula, expressed to the nearest $0.001 per HCF, is:

$$\text{WIAF} = \frac{(a)+(b)}{(c)}$$

   Where:

   (a) is the estimated water infrastructure related expense for 12 months commencing with the effective date of the WIAF. This expense shall include costs incurred for capital expenditures and debt service associated with construction, which are associated specifically with infrastructure investments to maintain and improve the reliability of the water distribution system, which expense has been approved in advance by the Board of Water and Power Commissioners to be included in the WIAF.

   (b) is the balance in the WIA Account.

   (c) is the estimated retail water sales in HCF for 12 months commencing with the effective date of the WIAF, less Schedule D and F sales but only excluding Schedule F sales through June 30, 2019.

3. A Water Infrastructure Adjustment Account shall be maintained by the Department on an annual basis. Entries to this account shall include:

   (a) An amount equal to the qualified water infrastructure related expenses identified in Section 3.R.2.(a) above as recorded annually.

(b) An amount equal to the uncollectible WIA portion of customer water bills as recorded annually.

(c) Less: An amount equal to revenue billed at the first, second, third and fourth tier rates that is attributable to the WIAF as recorded annually.

(d) Less: Through June 30, 2019, an amount equal to revenue billed to Schedule F customers that is allocated to the WIAF as recorded annually.

S. WATER EXPENSE STABILIZATION ADJUSTMENT

1. The Water Expense Stabilization Adjustment (WESA) shall be included in the first and second tier rates as set forth in Schedules A, B, C, and F, in the third and fourth tier rates as set forth in Schedule A, and in the Schedule E rate; and shall be included in bills under each service schedule and any contract where it is so specified. The WESA recovers any shortage between the target determined by the Chief Financial Officer for the Water System Expense Stabilization Fund and the fund's balance in order to stabilize rates in the event of unforeseen events impacting water service delivery and also the expense for legal and court costs or any judgment or settlement through application of the Water Expense Stabilization Adjustment Factor (WESAF). Except for revenue collected and uncollectible amounts that are attributable to Section 3.S.2.(b) below, revenue collected that is attributable to the WESAF shall be deposited into the Water System Expense Stabilization Fund.

2. The Water Expense Stabilization Adjustment Factor shall be calculated once each year and take effect on January 1. The WESAF shall also be calculated and take effect upon the Effective Date.

The WESAF formula, expressed to the nearest $0.001 per HCF, is:

$$\text{WESAF} = \frac{(a)+(b)}{(c)}$$

Where:

(a) is the balance in the WESA Account.

(b) is the estimated expense for legal and court costs or any judgment or settlement including interest payments thereon for 12 months commencing with the effective date of the WESAF.

(c) is the estimated retail water sales in HCF for 12 months commencing with the effective date of the WESAF, less Schedule

D and F sales but only excluding Schedule F sales through June 30, 2019.

3. A WESA Account shall be maintained by the Department on an annual basis. Entries to this account shall include:

   (a) An amount equal to the Water System Expense Stabilization Fund target determined by the Chief Financial Officer of the Department less the balance of the Water System Expense Stabilization Fund. The net amount for this 3.(a) shall in no event be less than zero.

   (b) An amount equal to the qualified expenses for legal and court costs or any judgment or settlement including interest payments thereon identified in Section 3.S.2.(b) as recorded annually.

   (c) An amount equal to the uncollectible WESA portion of customer water bills as recorded annually.

   (d) Less: An amount equal to revenue billed for the first, second, third, and fourth tier rates that is attributable to the WESAF as recorded annually.

   (e) Less: Through June 30, 2019, an amount equal to revenue billed to Schedule F customers that is allocated to the WESAF as recorded annually.

T. <u>RESALE OF WATER AND SUBMETERED CUSTOMERS</u>

1. The resale of water by Department customers is prohibited. Any resale of water will be cause for termination of service.

2. Notwithstanding the foregoing prohibition, master-metered residential facilities and mobile home parks where individual single-dwelling units are submetered, and commercial facilities where individual commercial units are submetered, may pass through their costs for water service subject to the following billing conditions:

   (a) The rates charged the individual submetered units shall not be more than those prescribed under Schedule B for Multi-Dwelling Unit Residential Customers, including any applicable credits under General Provisions O and P, and in the case of commercial facilities shall not be more than those prescribed under Schedule C.

   (b) The owner shall post in a conspicuous place the prevailing water rate schedule published by the Department that is used to bill the facility.

(c) The owner shall provide a separate written water bill for each submetered unit. The bill shall include the amount of water metered for the period, open and closing meter readings, and the amount of the bill. End users may not be required to pay more than if the Department provided the water directly to the end user.

3. In the event the water is not submetered and a cost/use allocation methodology is employed by the Department's customer to divide the cost among users of the water, the method used must fairly and equitably allocate to each end user of water the amount actually used by each end user and determine costs based on the actual use, all subject to the following requirements:

(a) The end users pay no more than if the Department provided the water directly.

(b) No additional costs, fees, services charges or expenses of any nature are added to the end users' bills by the Department's customer or the customer's agents, directly or indirectly, related to the allocation methodology, including, but not limited to, charges for establishing new accounts, meter reading charges, equipment charges, account charges or any charge related to maintaining or operating the allocation system.

(c) The Department's customer shall provide the Department and all end users the cost allocation methodology and results of that methodology as applied to each end user. In no event can the Department's customer use a calculation or methodology that results in the end user being charged for an amount greater than the actual consumption at the Department's actual rates charged to the Department's customer.

(d) The Board of Water and Power Commissioners may adopt rules consistent with the foregoing provisions.

U. DEFINITIONS

For purposes of this ordinance, the following definitions shall apply:

Advanced Treated Recycled Water - Recycled water that has undergone processing, including, but not limited to, membrane filtration, reverse osmosis, and advanced oxidation, beyond that of disinfected **tertiary** recycled water as defined by Section 60301.230 of Title 22 of the California Code of Regulations and any amendments to or replacements of that section.

Base Rate - A portion of a rate other than the adjustments.

Base Rate Revenue Target Adjustment - Recovers any shortage in revenue from Base Rates or credits back any excess collection of revenue from Base Rates due to variation in water sales from projections.

Billing Unit - One hundred cubic feet of water, equal to 748 gallons.

Commercial - Activities devoted primarily to business, property management or professional purposes.

Commodity Charge - A charge based upon the amount of water used by the customer.

Customer - Any person, public or private association or corporation, partnership, unincorporated association, or governmental agency supplied or entitled to be supplied by the Department.

Date of Presentation - The date on which a bill or notice is mailed or delivered by the Department to the customer.

Effective Date - The later of April 1, 2016, or the earliest possible effective date of this ordinance.

First Tier Rates - Rates for water usage within the first tier usage blocks as specified in applicable Rate Schedules and for Rate Schedule E water usage, including General Provision adjustments where applicable.

Fourth Tier Rates - Rates for water usage above third tier usage blocks as specified in Schedule A, including General Provision adjustments where applicable.

Governmental - The United States or any of its agencies, the state or any of its agencies, the Regents of the University of California, a county, a city, a district, a public authority, or any other political subdivision.

High Season - June 1 through September 30.

Industrial - Activities devoted primarily to manufacturing or processing.

Lifeline Customer Subsidy - Credit provided for qualified residential customers who are eligible for exemption from the City Utility User's Tax under provisions of the Los Angeles Municipal Code or the Revenue and Taxation Code of the State of California.

Low-Income Subsidy - Credit provided for qualified customers whose total household income does not exceed limits established by the Board of Water and Power Commissioners.

Low Income Subsidy Adjustment - Recovers the cost of credits given to lifeline and low-income customers as provided in General Provisions O and P.

Low Season - October 1 through May 31.

Multi-Dwelling Units - Two or more family dwelling units served by one meter.

Owens Valley Regulatory Adjustment - Recovers expense for the Owens Lake Dust Mitigation Program, the Lower Owens River Project, and the Owens Lake Master Project.

Potable Water - Water that meets the quality standards prescribed in the U.S. Public Health Service Drinking Water Standards, published in Title 40, Chapter I, Subchapter D, Parts 141, 142, and 143, of the Code of Federal Regulations, or water which is approved for drinking purposes by the State or local authority having jurisdiction.

Premises - An integrated land area, including improvements on the land, undivided by public thoroughfares or water distribution mains and where all parts of the area are operated under the same management for the same purpose.

Rate - An amount fixed by the Board of Water and Power Commissioners by resolution and approved by the City Council by ordinance to be charged for water service supplied by the Department to its customers.

Recycled Water (Also known as reclaimed water) - Treated wastewater or stormwater that is suitable for a direct beneficial use or a controlled use that would not otherwise be possible without treatment.

Residential - Activities devoted primarily to residential or household purposes in single-dwelling units and multi-dwelling units.

Second Tier Rates - Rates for water usage within second tier usage blocks as specified in Rate Schedules, including General Provision adjustments where applicable.

Service Availability Charge - A fixed charge per month for fire service based upon service connection size.

Service Connection - The pipe or tubing, fittings, and valves necessary to conduct water from the distribution main through the meter or shutoff valve on an unmetered service connection.

Submeter - A meter internal to the customer's distribution line, used to monitor water consumption, but not for Department billing purposes.

Temperature Zones - Three geographical groupings of areas as set forth in the table below based on generally common average temperatures.

ZIP CODE	TEMPERATURE ZONE			ZIP CODE	TEMPERATURE ZONE		
90001 - 90044		Medium		90401 - 90405	Low		
90045	Low			90501 - 90506		Medium	
90046 - 90048		Medium		90510	Low		
90049	Low			90710 - 90717		Medium	
90056-90065		Medium		90731 - 90732	Low		
90066	Low			90744		Medium	
90067 - 90071		Medium		90810 - 90844		Medium	
90073 - 90077	Low			91040 - 91367			High
90089		Medium		91393			High
90094	Low			91401		Medium	
90210 - 90232		Medium		91402			High
90245	Low			91403		Medium	
90247 - 90250		Medium		91405 - 91411			High
90254	Low			91423		Medium	
90260 - 90261		Medium		91436			High
90266 - 90277	Low			91502		Medium	
90278		Medium		91504 - 91505		Medium	
90291 - 90293	Low			91600 - 91607		Medium	
90301 - 90305		Medium					

Third Tier Rates - Rates for water usage within third tier usage blocks as specified in Schedule A, including General Provision adjustments where applicable.

Water Expense Stabilization Adjustment - Recovers any shortage between the target for the Water System Expense Stabilization Fund and the fund's balance in order to stabilize rates in the event of unforeseen events impacting water service delivery and also expense for legal and court costs or any judgment or settlement.

Water Infrastructure Adjustment - Recovers capital costs associated specifically with infrastructure investments to maintain and improve the reliability of the water distribution system.

Water Supply Cost Adjustment - Recovers Los Angeles Aqueduct, purchased water, groundwater, recycled water, water conservation, and any additional water supply source expenses.

Water Quality Improvement Adjustment - Recovers water quality related expense in order to equalize water quality throughout the City, to meet State and Federal water quality standards, and to provide security for water supply, storage, and conveyance infrastructure and related facilities.

Water Service - Includes availability of water to a premises through Department facilities and any water supplied through the facilities.

Winter - The months of December, January, February, and March.

Sec. 4. That reports shall be provided and interim rate reviews be conducted as described in this section. Nothing in this section shall be construed to limit the authority of the Office of Public Accountability granted to that office by the City Charter or City Administrative Code.

Establishing Key Performance Metrics and Targets

The Board of Water and Power Commissioners shall by resolution establish, for purposes of this section, the key performance metrics to evaluate the Department's progress toward its operational, financial, strategic, and policy goals or parameters (Board Metrics). The Board of Water and Power Commissioners shall also by resolution establish, for the Board Metrics, the corresponding targets and estimated potential variances from the targets that represent the Department's acceptable progress toward its operational, financial, strategic, and policy goals or parameters.

The initial set of Board Metrics is identified below, and the corresponding targets and estimated potential variances from the targets for this initial set shall be adopted by the Board of Water and Power Commissioners prior to the effective date of this ordinance.

The Board of Water and Power Commissioners may by resolution modify the Board Metrics, which modifications shall include, but not be limited to, the following: the metrics selected, corresponding targets, and the estimated potential variation from the targets. The Office of Public Accountability shall be notified by the Department of any proposed modification of the Board Metrics at least thirty (30) days prior to the modification of the Board Metrics and shall provide a written report to the Board of Water and Power Commissioners assessing the proposed modification.

Related Rate Adjustment Factor	Board Metric	Definition
None	Human Resources Budget vs. actual ($M)	Board Approved Annual Budget vs. Actual expenditures
	Human Resources Total Full Time Equivalent (FTEs) against plan	Total number of full time equivalent positions occupied vs. annual Authorized Personnel Resolution
	Financial and Human Resources Replacement Project total spending against plan	Board Approved Annual Budget vs. Actual expenditures
	Financial and Human Resources Replacement Project progress against schedule	Project milestones met in accordance with project schedule
	Number of new distribution infrastructure crews as compared to plan	Number of new crews dedicated to distribution infrastructure as compared to plan
Water Supply Cost Adjustment Factor	Water supply costs budget vs. actual ($M)	Board Approved Annual Budget vs. Actual expenditures
	Annual quantity of purchased water in acre-feet (AF) against plan	AF of water purchased against plan
	Annual quantity of recycled water delivered against plan (AF)	AF of recycled water delivered against plan
	Stormwater system capacity milestones (AF) against plan	AF of stormwater system capacity as of a milestone date against plan
	Annual groundwater production in Central Basin (AF) and San Fernando Basin (AF) against plan	AF of Groundwater in Central Basin against plan and AF of Groundwater in San Fernando Basin against plan
	Budget vs. actual ($M) for Aqueduct refurbishment	Board Approved Annual Budget vs. Actual expenditures
	Level of water conservation against target (GPCD)	Gallons per capita per day (GPCD) of water conserved against target
Water Infrastructure Adjustment Factor	Budget vs. actual ($M) for fixed assets replacement	Board Approved Annual Budget vs. Actual expenditures
	Budget vs. actual ($M) for Pump Stations	Board Approved Annual Budget vs. Actual expenditures
	Budget vs. actual ($M) for Regulator Relief Station Retrofits	Board Approved Annual Budget vs. Actual expenditures
	Assets replaced against plan	Miles of mainline, miles of trunkline, and number of meters replaced against plan
Water Quality Improvement Adjustment Factor	Total Water Quality Budget vs. actual ($M)	Board Approved Annual Budget vs. Actual expenditures
Water Expense Stabilization Adjustment Factor	Water Expense Stabilization Adjustment (WESA) account balance against target	Amount ($M) in the WESA account vs. plan
Owens Valley Regulatory Adjustment Factor	Budget vs. actual for Owens Lake O&M ($M)	Board Approved Annual Budget vs. Actual expenditures
Owens Valley Regulatory Adjustment Factor	Annual quantity of water conserved from Owens Lake (AF) against plan	AF of water conserved against plan

Reporting Progress to Board, Office of Public Accountability, and City Council

On February 1 and August 1 of every year, commencing in 2017, the Chief Financial Officer of the Department shall provide a written report to the Board of Water and Power Commissioners, which shall include, but not be limited to, the following:

(1) Board Metrics being monitored and results for each metric;
(2) the target set for each Board Metric;
(3) the variance of actual performance from the target;
(4) Department-identified causes for the variance; and
(5) the proposed mitigation plan to address a variance, if necessary.

The Department shall also provide to the Office of Public Accountability the above-mentioned report at least thirty (30) days prior to providing it to the Board of Water and Power Commissioners. On February 1 and August 1 of every year, commencing in 2017, the Office of Public Accountability shall provide a written report to the Board of Water and Power Commissioners assessing the Department's performance against the Board Metrics targets and any proposed mitigation plans.

If the Office of Public Accountability, in that Office's opinion, identifies in its report any substantive variances and/or related issues, which it believes also require review and discussion by the City Council, the Office of Public Accountability shall forward its report to the Energy and Environment Committee of the City Council at the same time it is provided to the Board of Water and Power Commissioners.

The Energy and Environment Committee shall review all of the above-mentioned reports and then, at its discretion, may: request additional information; hold a committee hearing with the Department and the Office of Public Accountability; make written recommendations to the Board of Water and Power Commissioners; and/or move that the City Council assert jurisdiction pursuant to Charter Section 245 relative to a Board of Water and Power Commissioners action on the related adjustment factors.

In addition to the above-mentioned reports, the Department shall also provide, on April 1 and October 1 of every year, commencing in 2017, written reports to the Office of Public Accountability, which shall include the Board Metrics being monitored; the results for each metric; the target set for each metric; and the variance of actual performance from the target.

On July 1, 2017, the Board of Water and Power Commissioners shall by resolution take action to choose whether or not to order the Department to prepare possible revisions to the Board Metrics, their corresponding targets and estimated potential variances from the targets, or the review process itself for consideration by the Board of Water and Power Commissioners. The Energy and Environment Committee shall review the Board of Water and Power Commissioner's action pursuant to the previous sentence and then, at the committee's discretion, may: request additional information; hold a committee hearing with the Department and the Office of Public

Accountability; make written recommendations to the Board of Water and Power Commissioners; and/or move that the City Council assert jurisdiction pursuant to Charter Section 245 relative to said Board of Water and Power Commissioners action.

Additional Reporting/Interim Rate Review

To provide an opportunity for the Department to realign its forecasts with actual conditions and to communicate related issues to the Board of Water and Power Commissioners and to the City Council, the Department and the Office of Public Accountability shall each conduct their own interim rate review. The Department shall provide its review not later than February 1, 2019, and the OPA shall provide its review not later than April 1, 2019, to both the Board of Water and Power Commissioners and the Energy and Environment Committee. Each interim rate review shall include the following:

a. Five-year Financial and Performance Outlook

Calculate a new five-year financial plan for the Department using then existing assumptions that will include an updated forecast for revenues, expenditures, and overall fiscal performance. The review will also include an analysis of the Department's overall progress on the Board Metrics; propose any revision to the metrics being evaluated; and analyze the review process itself.

b. Base Rate Revenue Targets

Calculate revised base rate revenue targets for Fiscal Year 2018/19 and Fiscal Year 2019/20 using then existing assumptions that will include an updated forecast for revenues, expenditures, and overall fiscal performance.

c. City Council and Mayoral Requests for Reports and Recommendations

Determine the status of the Department's progress in responding to and addressing any requests for reports and recommendations resulting from the City Council and Mayor's consideration of this ordinance.

d. Material Misalignment with Forecast or Market

Provide explanation of, and, if deemed necessary by the reviewer, alternatives to, any elements of the then existing rate design that appear to be materially misaligned with the Department's updated forecast for revenues, expenditures, and overall fiscal performance, or with conditions in California's market for water sales to retail customers.

After receipt of the results of the interim rate review from the Department and the Office of Public Accountability, the Board of Water and Power Commissioners shall by resolution take action to choose whether or not to order the Department to prepare possible revisions to this ordinance for consideration by the Board of Water and Power Commissioners no later than June 30, 2019. The Energy and Environment Committee shall review the results of each interim rate review and the action by the Board of Water and Power Commissioners pursuant to the previous sentence and then, at the committee's discretion, may: request additional information; hold a committee hearing with the Department and the Office of Public Accountability; make written recommendations to the Board of Water and Power Commissioners; and/or move that the City Council assert jurisdiction pursuant to Charter Section 245 relative to a Board of Water and Power Commissioners action on the related adjustment factors or a Board of Water and Power Commissioners action to choose to not order the Department to prepare possible revisions to this ordinance for consideration by the Board of Water and Power Commissioners.

Additionally, after receipt of the results of the interim rate review from the Department and the Office of Public Accountability, if any of the revised base rate revenue targets calculated for Fiscal Year 2018/19 and Fiscal Year 2019/20 as part of the interim rate review varies from the respective Base Rate Revenue Target stated in this ordinance, the Board of Water and Power Commissioners shall by resolution take further action to choose to increase or decrease the respective Base Rate Revenue Target stated in this ordinance to any degree not in excess of two percent (2%) of that stated target or to leave the respective Base Rate Revenue Target stated in this ordinance unchanged. The Energy and Environment Committee shall review the Board of Water and Power Commissioner's action regarding the respective target and then, at the committee's discretion, may: request additional information; hold a committee hearing with the Department and the Office of Public Accountability; make written recommendations to the Board of Water and Power Commissioners; and/or move that the City Council assert jurisdiction pursuant to Charter Section 245 relative to said Board of Water and Power Commissioners action.

Sec. 5. That the Department shall perform a cost of service study prior to proposing any change to the Base Rates stated in this ordinance to the Board of Water and Power Commissioners after June 30, 2019.

Sec. 6. That, upon the Effective Date, the rate schedules and all other terms and conditions of this ordinance shall become operative and the rate schedules and all other terms and conditions established by City of Los Angeles Ordinance No. 170435, as amended by Ordinance No. 171639, Ordinance No. 173017, Ordinance No. 175964, Ordinance No. 177968, Ordinance No. 179802, and Ordinance No. 182047, shall be suspended; provided that the rate schedules, conditions, and provisions which were approved by said ordinances pertaining to service in the City of Los Angeles and contiguous areas shall remain in effect until the rate schedules, conditions, and provisions as provided for herein shall become effective.

Provided further, however, in the event that the imposition of the rates provided for in this ordinance is enjoined, temporarily or permanently, by a court of competent jurisdiction, which order materially affects the implementation of this ordinance, then, upon such determination by the Board of Water and Power Commissioners, the rate schedules, conditions, and provisions provided in Ordinance No. 170435, as amended by Ordinance No. 171639, Ordinance No. 173017, Ordinance No. 175964, Ordinance No. 177968, Ordinance No. 179802, and Ordinance No. 182047, shall be in full force and effect from the effective date of such injunction until said injunction is dissolved or a new rate ordinance is approved by this Council.

Sec. 7. That the approval of the foregoing water rates by this Council is exempt from the requirements of the California Environmental Quality Act under the provisions of the Public Resources Code, Section 21080(b)(8), and this Council makes this claim of exemption pursuant to said section and authorizes claim of exemption to be filed with the appropriate agencies.

Sec. 8. That if any section, subsection, sentence, clause, or phrase in this ordinance or the application thereof to any person or circumstance is for any reason held invalid, the validity of the remainder of the ordinance or the application of such provision to other persons or circumstances shall not be affected thereby. The City Council hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or the application thereof to any person or circumstance be held invalid.

Sec. 9. The City Clerk shall certify to the passage of this ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that the foregoing ordinance was introduced at the meeting of the Council of the City of Los Angeles MAR 0 2 2016, and passed at it's meeting of MAR 1 5 2016.

HOLLY L. WOLCOTT, City Clerk

By ______________ Deputy

Approved 3/15/16

______________ Mayor

Approved as to Form and Legality

MICHAEL N. FEUER, City Attorney

By ______________
BRIAN E. STEWART
Deputy City Attorney

Date 2/12/16

File No. 15-1543

c:\users\29034\downloads\fixed rates by dwp for water service (bes 2-9-16).doc

Urban Water
Management Plan

Appendix D

Public Notices

Outreach Overview

The Los Angeles Department of Water and Power (LADWP) conducted an extensive outreach campaign to encourage community involvement during the 2015 Urban Water Management Plan (UWMP) update process. The campaign included the release of five Informational Bulletins to inform and update the public on both the UWMP process and changes since the 2010 UWMP. Following the bulletin release, LADWP held four public meetings for the public to receive information and provide feedback on the UWMP, prior to draft 2015 UWMP release in February 2016. The outreach campaign concluded with two public hearings, which provided an opportunity for additional input and comments on the plan, before it was taken to the LADWP Board of Commissioners for adoption.

The date, time, location, and attendance of each meeting is detailed below:

Public Informational Meetings				
Dates		**Time**	**Location**	**Attendees**
Tuesday	1/19/16	9:00 AM	The California Endowment 1000 N Alameda St. Los Angeles, CA 90012	15
Thursday	1/21/16	6:00 PM	Council District 3 Office 19040 Vanowen St. Reseda CA 91135	14
Wednesday	1/27/16	6:00 PM	Felicia Mahood Multipurpose Center 11338 Santa Monica Blvd. Los Angeles CA 90025	8
Thursday	1/28/16	6:00 PM	LADWP Headquarters 111 N. Hope St. Los Angeles CA 90012	30
Public Hearing				
Thursday	3/3/16	6:00 PM	LADWP Headquarters 111 N. Hope St. Los Angeles CA 90012	6
Wednesday	3/9/16	6:00 PM	Sepulveda Garden Center 16633 Magnolia Blvd. Encino CA 91406	11

In response to presentation requests, LADWP attended two neighborhood council meetings to present information on the 2015 UWMP. The date, time, and location of each meeting is detailed below:

Presentation Requests					
Group	Dates		Time	Location	Attendees
Los Angeles Neighborhood Council Coalition	Saturday	2/6/16	10:00AM	West Los Angeles Civic Center 1645 Corinth Ave. Los Angeles, CA 90025	50
Central San Pedro Neighborhood Council	Tuesday	2/9/16	6:30PM	Port of Los Angeles High School 250 W. 5th Street San Pedro, CA 90731	100

60-Day Notification

Over 60-days prior to the March 2016 public hearings, the LADWP notified the County of Los Angeles, the City of Culver City, and the City of West Hollywood regarding the 2015 UWMP update. In the communication, LADWP outlined the date/time/location for the January public informational meetings, the draft 2015 UWMP release, and the March public hearings. A copy of each 60-day notice is included in the following pages.

Email Notification

Leading up to the public informational meetings in January, LADWP released Six Informational Bulletins to inform and update the public on both the UWMP process and changes since the 2010 UWMP. The Bulletins also served as an invitation for the public to attend the informational meetings in January 2016. The sixth Bulletin served to notify the public of the draft 2015 UWMP release and the two public hearings in March, 2016. The Bulletins were emailed to nearly 2,600 recipients and posted in the LADWP Newsroom webpage.

A listing of each informational bulletin is provided below:

Public Informational Bulletin Release	
Dates	
Friday	11/20/2015
Friday	12/11/2015
Wednesday	12/16/2015
Wednesday	1/6/2016
Thursday	1/14/2016
Friday	2/12/2016

A copy of each Informational Bulletin is included in the following pages.

Media Publications

In accordance with CWC Section 10642, LADWP published a notice to inform the public of the March 2016 Public Hearings. More information on the publications is listed below:

Media Outlet	Date
Los Angeles Daily News	2/17/2016
La Opinion (Spanish)	2/17/2016
Los Angeles Daily News	2/24/2016
La Opinion (Spanish)	2/24/2016

A copy of each public notice is included in the following pages.

Website Posting

The LADWP created a webpage at www.ladwp.com/uwmp to provide information on the UWMP Act and LA's UWMP development. The webpage included links to download the 2010 UWMP and the draft 2015 UWMP. Information to attend the public meetings was also available on the site. The latest version of the webpage is included in the following pages.

60-Day Notice

Los Angeles LA DWP Department of Water & Power

ERIC GARCETTI
Mayor

Commission
MEL LEVINE, *President*
WILLIAM W. FUNDERBURK JR., *Vice President*
JILL BANKS BARAD
MICHAEL F. FLEMING
CHRISTINA E. NOONAN
BARBARA E. MOSCHOS, *Secretary*

MARCIE L. EDWARDS
General Manager

December 21, 2015

Ms. Gail Farber, Director
Los Angeles County Department of Public Works
900 South Freemont Avenue
Alhambra, California 91803

Dear Ms. Farber:

Subject: City of Los Angeles 2015 Urban Water Management Plan (UWMP)

The Los Angeles Department of Water and Power (LADWP) is sending you this notice to inform you of 2015 UWMP updates that are being considered. The 2015 UWMP is currently in the draft development phase and will contain the City of Los Angeles' long-term strategy for managing water resources and ensuring water supply reliability through the year 2040.

As part of the California Water Code, Section 10621, agencies are required to notify cities and counties within their service area regarding UWMP updates. Notification must occur at least 60 days before a Public Hearing. LADWP will release a draft 2015 UWMP in February 2016 and host two Public Hearings in March 2016 to solicit comments. Your agency is invited to attend either hearing as scheduled below:

2015 UWMP Public Hearing		
Date	Time	Location
Thursday, March 3, 2016	6:00 p.m.– 8:00 p.m.	LADWP Headquarters 111 North Hope Street Los Angeles, CA 90012
Wednesday, March 9, 2016	6:00 p.m.– 8:00 p.m.	Sepulveda Garden Center 16633 Magnolia Boulevard Encino, CA 91406

In addition, LADWP will host four meetings in January 2016 to provide more information on the UWMP planning effort. Your agency is invited to attend any of the four meetings as scheduled below:

2015 Public Informational Meeting		
Date	**Time**	**Location**
Tuesday, January 19, 2016	9:00 a.m.–11:00 a.m.	The California Endowment 1000 North Alameda Street Los Angeles, CA 90012
Thursday, January 21, 2016	6:00 p.m.– 8:00 p.m.	Council District 3 Office 19040 Vanowen Street Reseda, CA 91135
Wednesday, January 27, 2016	6:00 p.m.– 8:00 p.m.	Felicia Manhood MPC 11338 Santa Monica Blvd. Los Angeles, CA 90025
Thursday, January 28, 2016	6:00 p.m.– 8:00 p.m.	LADWP Headquarters 111 North Hope Street Los Angeles, CA 90012

Comments received during the public informational meetings and hearings will be considered for the 2015 UWMP. Organizational structure of LADWP's 2015 UWMP will be similar to the 2010 UWMP and include discussion on water demand, conservation, various water supplies, water reliability, climate change, etc. For your reference, LADWP's 2010 UWMP is available on our Web site at htttp://www.ladwp.com/uwmp.

If you have any questions or comments, please contact Mr. Simon Hsu, Supervisor of Strategic Planning and Technical Analysis, at (213) 367-2970, or e-mail him at uwmp@ladwp.com

Sincerely,

David R. Pettijohn
Director of Water Resources

DK:yrg
c: Mr. Simon Hsu

Los Angeles Department of Water & Power

ERIC GARCETTI
Mayor

Commission
MEL LEVINE, *President*
WILLIAM W. FUNDERBURK JR., *Vice President*
JILL BANKS BARAD
MICHAEL F. FLEMING
CHRISTINA E. NOONAN
BARBARA E. MOSCHOS, *Secretary*

MARCIE L. EDWARDS
General Manager

December 21, 2015

Mr. Oscar Delgado, Director
Department of Public Works
City of West Hollywood
8300 Santa Monica Boulevard
West Hollywood, California 90069

Dear Mr. Delgado:

Subject: City of Los Angeles 2015 Urban Water Management Plan (UWMP)

The Los Angeles Department of Water and Power (LADWP) is sending you this notice to inform you of 2015 UWMP updates that are being considered. The 2015 UWMP is currently in the draft development phase and will contain the City of Los Angeles' long-term strategy for managing water resources and ensuring water supply reliability through the year 2040.

As part of the California Water Code, Section 10621, agencies are required to notify cities and counties within their service area regarding UWMP updates. Notification must occur at least 60 days before a Public Hearing. LADWP will release a draft 2015 UWMP in February 2016 and host two Public Hearings in March 2016 to solicit comments. Your agency is invited to attend either hearing as scheduled below:

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If you have any questions or comments, please contact Mr. Simon Hsu, Supervisor of Strategic Planning and Technical Analysis, at (213) 367-2970, or e-mail him at uwmp@ladwp.com

Sincerely,

David R. Pettijohn
Director of Water Resources

DK:yrg
c: Mr. Simon Hsu

Los Angeles Department of Water & Power

ERIC GARCETTI
Mayor

Commission
MEL LEVINE, *President*
WILLIAM W. FUNDERBURK JR., *Vice President*
JILL BANKS BARAD
MICHAEL F. FLEMING
CHRISTINA E. NOONAN
BARBARA E. MOSCHOS, *Secretary*

MARCIE L. EDWARDS
General Manager

December 21, 2015

Mr. Charles D. Herberston
Director of Public Works
City of Culver City
9770 Culver Boulevard, 2nd Floor
Culver City, California 90232

Dear Mr. Herbertson:

Subject: City of Los Angeles 2015 Urban Water Management Plan (UWMP)

The Los Angeles Department of Water and Power (LADWP) is sending you this notice to inform you of 2015 UWMP updates that are being considered. The 2015 UWMP is currently in the draft development phase and will contain the City of Los Angeles' long-term strategy for managing water resources and ensuring water supply reliability through the year 2040.

As part of the California Water Code, Section 10621, agencies are required to notify cities and counties within their service area regarding UWMP updates. Notification must occur at least 60 days before a Public Hearing. LADWP will release a draft 2015 UWMP in February 2016 and host two Public Hearings in March 2016 to solicit comments. Your agency is invited to attend either hearing as scheduled below:

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If you have any questions or comments, please contact Mr. Simon Hsu, Supervisor of Strategic Planning and Technical Analysis, at (213) 367-2970, or e-mail him at uwmp@ladwp.com

Sincerely,

David R. Pettijohn
Director of Water Resources

DK:yrg
c: Mr. Simon Hsu

Public Informational Bulletins

LADWP Newsroom

DATE: November 20, 2015 6:53:51 AM PST

Los Angeles Department of Water and Power

Invitation to 2015 Urban Water Management Plan Informational Meetings

Good afternoon,

LADWP is in the process of preparing the 2015 Urban Water Management Plan (UMWP) for the City of Los Angeles (City). The UWMP will contain the City's long-term strategy for managing water resources and ensuring water supply reliability through the year 2040.

The UWMP not only provides the framework for future reliability, but meets State requirement of the City to submit a UWMP every five years in compliance with the California Urban Water Management Planning Act.

Key elements of the UWMP include:

-Existing and planned sources of water
-Water demand forecasting, and conservation efforts to reduce water demand
-Assessment of reliability and vulnerability of water supply
-Activities to develop alternative sources of water
-Water shortage contingency analysis

LA's 2015 UWMP

The 2015 UWMP will build upon the 2010 UWMP and will be consistent with the City's goals and policy objectives for a reliable water supply, such as the Mayor's Executive Directive No. 5 and the Sustainable City pLAn. Since the 2010 UWMP, water supplies that support Los Angeles continue to be under stress due to changing climate and drought. Consequently, the 2015 UWMP will include aggressive measures to increase water use efficiency, develop additional local supplies, increase supply diversity, and reduce dependence on purchased imported supplies. Specific initiatives in the UWMP are based on recommendations from the Recycled Water Master Planning Documents, the Groundwater System Improvement Study, the Stormwater Capture Master Plan, and the Conservation Potential Study. These planning efforts have included significant public outreach and public comment. Beyond the UWMP, LADWP is committed to ongoing public outreach that addresses emerging water resource challenges and future water supply reliability.

Tentative UWMP Timeline

▪ January 2016	Four public informational meetings (Date/Time/Location TBD)
▪ February 2016	Release of the Draft 2015 UWMP
▪ March 2016	Two Public Hearings
▪ May 2016	Expected adoption by the LADWP Board of Commissioners
▪ June 2016	Submittal to California Department of Water Resources

The public meetings in January are scheduled prior to the draft UWMP release date of February 2016 to provide opportunities for the public to receive information and provide feedback. Comments received during these meetings will be considered in the UWMP. After adoption by the Board of Commissioners, the final UWMP will be submitted to the California Department of Water Resources by July 1, 2016.

We hope you can join us in one of the four (4) January meetings. More details will be available in our next informational bulletin so please stay tuned!

To learn more about the Urban Water Management Plan, we invite you to visit our webpage at www.ladwp.com/uwmp or to send email inquiries to uwmp@ladwp.com.

Thank you!

2015 Urban Water Management Plan Team

LADWP Newsroom

DATE: December 11, 2015 12:23:00 AM PST

Email Informational Bulletin

LA's 2015 Urban Water Management Plan

Planning for the City's Future Water Demand

LADWP is currently in the draft development phase for the 2015 Urban Water Management Plan (UMWP) for the City of Los Angeles (City). The UWMP will contain the City's long-term strategy for managing water resources and ensuring water-supply reliability through the year 2040. This process requires that the City forecast its future water demands over the next 25 years.

Changes in Water Resources and Conservation Goals

Since the 2010 UWMP was published, Los Angeles has experienced some of the driest years on record. In response to these historic dry conditions affecting the City's imported water supplies, Governor Brown and Mayor Garcetti enacted near-term conservation goals and initiated a long-term campaign to reduce the City's per capita water use, respectively. Specifically, the Mayor's Sustainability Office has prepared the Sustainable City Plan (pLAn), calling for a 20% reduction in water use by 2017 and 25% by 2035.

Water Demand Forecasting

Forecasting demand requires updated estimates of population, analysis of historical demand trends, and predicting future success in water use efficiency by all LADWP customers in meeting conservation goals. With respect to conservation, the goals established in the Sustainable City Plan provide the basis for analysis.

The City utilizes population growth and demographic projections from the most recent Regional Transportation Plan (RTP) developed by the Southern California Association of Governments (SCAG). The RTP is updated by SCAG every four years to forecast the movement of population and economic growth within Southern California.

The 2015 UWMP will forecast water demand by using the latest available data in the RTP, sound modeling principles, and the conservation goals established by the Sustainable City Plan. This demand forecast will be used to assess future reliability and refine the City's local supply development plans.

2015 UWMP Timeline

Join us for one or more of our upcoming public meetings covering the UWMP listed below.

January Information Meeting Schedule* (Flyer)

Date	Time	Location
Jan 19	9 am -11 am	California Endowment, 1000 N. Alameda St., Los Angeles CA 90012
Jan 21	6 pm - 8 pm	CD3 Office, 19040 Vanowen St., Reseda CA 91335
Jan 27	6 pm - 8 pm	Felicia Mahood MPC, 11338 Santa Monica Blvd., Los Angeles CA 90025

Jan 28	6 pm – 8 pm	LADWP Headquarters, 111 N. Hope St., Los Angeles CA 90012

Timeline Overview

Feb 2016	Release of the Draft 2015 UWMP
Mar 2016	Two Public Hearings
May 2016	Expected adoption by the LADWP Board of Commissioners
Jun 2016	Submittal to California Department of Water Resources

**The public meetings in January are scheduled prior to the draft UWMP release in February to provide opportunities for the public to receive information and provide feedback.*

Please stay tuned for additional informational bulletins. To learn more about the Urban Water Management Plan, visit **www.ladwp.com/uwmp** or email **uwmp@ladwp.com**.

DATE: December 16, 2015 3:37:19 AM PST

LADWP News
LOS ANGELES DEPARTMENT OF WATER AND POWER
111 North Hope St., Room 1520, Los Angeles, CA. 90012-5701
Phone (213) 367-1361 - After Hours (213) 367-3227
www.ladwp.com
LA DWP Los Angeles Department of Water & Power

LA's 2015 Urban Water Management Plan

Diversify with More Reliable Local Water Supplies

LADWP's 2015 Urban Water Management Plan (UWMP) will contain the City's long-term water resources management strategy to ensure water reliability through the year 2040. The UWMP will examine existing and planned sources of water supply for the City of Los Angeles.

Existing Water Resources and Challenges

The City's current water supply sources include:

- Imported water from Owens Valley and Mono Lake Basin (Los Angeles Aqueduct)
- Imported water purchased from the Metropolitan Water District (MWD), coming from the California Aqueduct and the Colorado River Aqueduct
- Local water sources including groundwater, captured stormwater, recycled water, and conservation

Over the past several years, the City's imported water supplies have been impacted by legal issues, environmental demands for water, and a multi-year drought. In addition, contamination in the San Fernando Basin has limited our ability to fully utilize our local groundwater. Despite extensive conservation and water management efforts, these challenges have caused the City to become more reliant on MWD, reaching an all-time high of 75% of the total supply in 2013-2014.

The multi-year drought prompted several statewide and local initiatives including: a Statewide Drought Declaration, a Gubernatorial Executive Order, and a Mayoral Executive Directive. The City has captured its water-supply goals in the Sustainable City Plan (pLAn), issued in April 2015. The pLAn outlines a multi-faceted approach to reducing water use and developing local and more sustainable water supplies.

Future Water Supply Goals and Development

As outlined in the pLAn, the City has adopted the following supply goals. These goals will be the basis for the 2015 Urban Water Management Plan's conservation and local supply development initiatives.

- Reduce per capita water use 20% by 2017, 22.5% by 2025, and 25% by 2035 (from 2014 levels)
- Reduce imported water purchases 50% by 2025 (from 2014 levels)

- Obtain 50% of LA's water supply locally, including 150,000 AFY of stormwater capture by 2035
- Clean-up San the Fernando Groundwater Basin

2015 UWMP Timeline

Join us for one or more of our upcoming UWMP public meetings. For more details on these meetings, a flyer in both English and Spanish outlining the public meetings can be viewed online by clicking here.

- January 2016 Public Informational Meetings

Jan 19	9 am -11 am	California Endowment, 1000 N. Alameda St., Los Angeles CA 90012
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- February 2016 Release of the Draft 2015 UWMP
- March 2016 Two Public Hearings
- May 2016 Expected adoption by the LADWP Board of Commissioners
- June 2016 Submittal to California Department of Water Resources

**The public meetings in January are scheduled prior to the UWMP release date (February 2016) to provide opportunities for the public to receive information and provide feedback.*

To learn more about the Urban Water Management Plan, visit www.ladwp.com/uwmp or email uwmp@ladwp.com.

LADWP Newsroom

DATE: January 6, 2016 7:47:38 AM PST

LADWP News

LOS ANGELES DEPARTMENT OF WATER AND POWER
111 North Hope St., Room 1520, Los Angeles, CA. 90012-5701
Phone (213) 367-1361 - After Hours (213) 367-3227
www.ladwp.com

Los Angeles Department of Water & Power

LA's 2015 Urban Water Management Plan

The Importance of Integrated Resources Planning

LADWP's 2015 Urban Water Management Plan (UWMP) will include the City's long-term water resources management strategy to ensure water reliability through the year 2040. These strategic goals are drawn extensively from the Integrated Resources Planning (IRP) process, which is used by many water utilities to plan for long term water reliability. Below is a description of IRP processes that inform the update of the 2015 UWMP, as well as a brief overview of the City of LA's history of participation in regional IRP processes.

Regional Planning Efforts

LADWP has been involved in integrated resources planning (IRP) since its first UWMP in 1985 which incorporated conservation, recycled water, stormwater capture, and supplies from the Metropolitan Water District of Southern California (MWD).

In 1993, LADWP built upon its IRP efforts by participating in the Southern California region's first Integrated Resources Plan initiated by MWD.

In 1999, the City initiated its first IRP, which was adopted by the City Council in 2006. LADWP also participates in the development of the Greater Los Angeles County Integrated Regional Water Management (IRWM) Plan, which was last updated in 2014. The IRWM process is led by the Los Angeles County Department of Public Works.

An Integrated Approach Yields Multiple Benefits

The benefits of an integrated watershed approach incorporates extensive public engagement and dialogue, as well as identification of opportunities that might otherwise be missed if public agencies tasked with water, wastewater and stormwater issues did not share information or coordinate efforts. For example, a flood control project can be designed to provide multiple benefits beyond ensuring public safety, such as protecting private and commercial property and creating water-supply benefits.

A specific example of a benefit achieved through IRP is local production of recycled water, achieved through collaborative efforts of LADWP and the LA Bureau of Sanitation. To build on the success of the IRP, the City is taking integration a step further by launching the One Water LA 2040 Plan. This plan continues the focus on multi-jurisdictional and multi-benefit projects with the goal of making the City more sustainable. Similar to the City's initial

IRP, the One Water LA 2040 Plan is a stakeholder driven process.

2015 UWMP Timeline

Join us for one or more of our upcoming UWMP public meetings. For more details on these meetings, a flyer in both English and Spanish outlining the public meetings can be viewed online by clicking here.

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**The public meetings in January are scheduled prior to the UWMP release date (February 2016) to provide opportunities for the public to receive information and provide feedback.*

To learn more about the Urban Water Management Plan, visit www.ladwp.com/uwmp or email uwmp@ladwp.com.

LADWP Newsroom

DATE: January 14, 2016 7:42:39 AM PST

LADWP News
LOS ANGELES DEPARTMENT OF WATER AND POWER
111 North Hope St., Room 1520, Los Angeles, CA. 90012-5701
Phone (213) 367-1361 - After Hours (213) 367-3227
www.ladwp.com
LA DWP Los Angeles Department of Water & Power

LA's 2015 Urban Water Management Plan

Water Supply Reliability Assessment

LADWP's 2015 Urban Water Management Plan (UWMP) will contain the City's long-term water resources management strategy to ensure water reliability through the year 2040. This 5th and final bulletin provides information on LADWP's Water Supply Reliability Assessment.

Climate Variability Affects Imported Supplies

LADWP analyzes historical hydrologic records to forecast available water supplies in average, single-dry, and multiple-dry years. In recent years, the City's imported water supplies have been stressed due to multi-year droughts and other extreme weather events. These conditions threaten the reliability of the City's imported water supplies, including water purchased from the Metropolitan Water District (MWD).

Currently, the City receives well over half its water from (MWD). Although a reliable supplemental supply from MWD remains essential to water reliability, the Sustainable City pLAn calls for the City to be no more than 50% dependent on MWD by the year 2025.

Developing Local Supplies Enhances Reliability

LADWP is accelerating the development of more sustainable water supplies through the development of additional water conservation, water recycling, and stormwater capture. Central to this effort is the restoration of the San Fernando groundwater basin. This basin is a tremendous asset, capable of storing large amounts of water that can be used in dry years. These efforts will reduce the City's dependence on imported water and enhance reliability.

Planning for Catastrophic Supply Interruptions

LADWP also has contingency plans in place to respond to extreme drought and other potential catastrophic events. For example, an earthquake could interrupt the delivery of imported water, in which case both MWD and LADWP can provide up to 6 months of water from reservoirs located south of the San Andreas Fault. These contingencies and the City's Emergency Water Conservation Plan will address up to 50% shortage of water supply.

2015 UWMP Timeline

Join us for one or more of our upcoming UWMP public meetings. For more details on these meetings, a flyer in both English and Spanish outlining the public meetings can be viewed online by clicking here.

- January 2016 Public Informational Meetings*

Jan 19	9 am -11 am	California Endowment, 1000 N. Alameda St., Los Angeles CA 90012
Jan 21	6 pm - 8 pm	CD3 Office, 19040 Vanowen St., Reseda CA 91335
Jan 27	6 pm - 8 pm	Felicia Mahood MPC, 11338 Santa Monica Blvd., Los Angeles CA 90025
Jan 28	6 pm – 8 pm	LADWP Headquarters, 111 N. Hope St., Los Angeles CA 90012

- February 2016 Release of the Draft 2015 UWMP
- March 2016 Two Public Hearings
- May 2016 Expected adoption by the LADWP Board of Commissioners
- June 2016 Submittal to California Department of Water Resources

**The public meetings in January are scheduled prior to the UWMP release date (February 2016) to provide opportunities for the public to receive information and provide feedback.*

To learn more about the Urban Water Management Plan, visit www.ladwp.com/uwmp or email uwmp@ladwp.com.

DATE: January 22, 2016 2:29:32 PM PST

LADWP News
LOS ANGELES DEPARTMENT OF WATER AND POWER
111 North Hope St., Room 1520, Los Angeles, CA. 90012-5701
Phone (213) 367-1361 - After Hours (213) 367-3227
www.ladwp.com
LA DWP Los Angeles Department of Water & Power

2015 UWMP Info Meetings in West LA and Downtown LA

Live Webcast of Downtown LA Meeting

LADWP will host two informational meetings on the 2015 Urban Water Management Plan (UWMP), which contains the City's long-term water resources management strategy to ensure water reliability through the year 2040.

The next meeting will be held on Wed., Jan. 27 from 6 p.m. to 8 p.m. at the Felicia Mahood Multipurpose Center, 11338 Santa Monica Boulevard, Los Angeles 90025.

The final informational meeting, which can be attended in person or online via a live webcast, will be held on Thu., Jan. 28 from 6 p.m. to 8 p.m. at LADWP's headquarters, the John Ferraro Building, 111 N. Hope Street, Los Angeles 90012. **To attend in person or via the web, email your RSVP to uwmp@ladwp.com. Instructions for webcast logon will be provided by email in advance of the meeting.**

The two meetings are the last in a series of four informational meetings being held in January for the public to receive information and provide feedback on the 2015 UWMP prior to the release of the draft plan in February. Two public hearings are also scheduled in March as detailed in the timeline below.

2015 UWMP Timeline

Join us for one or more of our upcoming UWMP public meetings. For more details on these meetings, a flyer in both English and Spanish outlining the public meetings can be viewed online by clicking here.

- January 2016 Public Informational Meetings

Jan 27	6 pm - 8 pm	Felicia Mahood MPC, 11338 Santa Monica Blvd., Los Angeles CA 90025
Jan 28	6 pm – 8 pm	LADWP Headquarters, 111 N. Hope St., Los Angeles CA 90012

February 2016	Release of the Draft 2015 UWMP
March 2016	Two Public Hearings
May 2016	Expected adoption by the LADWP Board of Commissioners
June 2016	Submittal to California Department of Water Resources

To learn more about the Urban Water Management Plan, visit www.ladwp.com/uwmp or email uwmp@ladwp.com.

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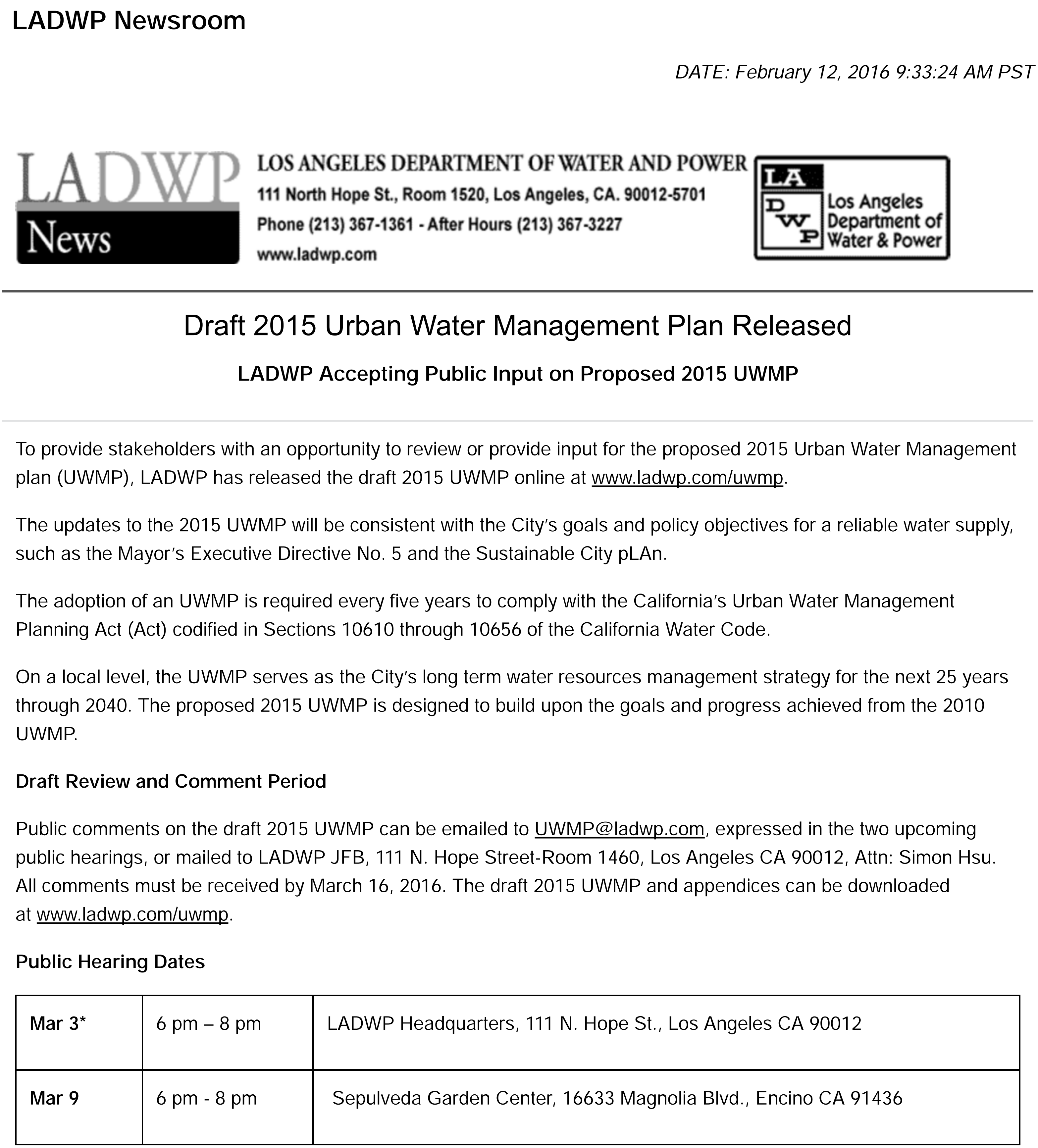

LADWP Newsroom

DATE: February 12, 2016 9:33:24 AM PST

LADWP News

LOS ANGELES DEPARTMENT OF WATER AND POWER
111 North Hope St., Room 1520, Los Angeles, CA. 90012-5701
Phone (213) 367-1361 - After Hours (213) 367-3227
www.ladwp.com

LA DWP Los Angeles Department of Water & Power

Draft 2015 Urban Water Management Plan Released

LADWP Accepting Public Input on Proposed 2015 UWMP

To provide stakeholders with an opportunity to review or provide input for the proposed 2015 Urban Water Management plan (UWMP), LADWP has released the draft 2015 UWMP online at www.ladwp.com/uwmp.

The updates to the 2015 UWMP will be consistent with the City's goals and policy objectives for a reliable water supply, such as the Mayor's Executive Directive No. 5 and the Sustainable City pLAn.

The adoption of an UWMP is required every five years to comply with the California's Urban Water Management Planning Act (Act) codified in Sections 10610 through 10656 of the California Water Code.

On a local level, the UWMP serves as the City's long term water resources management strategy for the next 25 years through 2040. The proposed 2015 UWMP is designed to build upon the goals and progress achieved from the 2010 UWMP.

Draft Review and Comment Period

Public comments on the draft 2015 UWMP can be emailed to UWMP@ladwp.com, expressed in the two upcoming public hearings, or mailed to LADWP JFB, 111 N. Hope Street-Room 1460, Los Angeles CA 90012, Attn: Simon Hsu. All comments must be received by March 16, 2016. The draft 2015 UWMP and appendices can be downloaded at www.ladwp.com/uwmp.

Public Hearing Dates

Mar 3*	6 pm – 8 pm	LADWP Headquarters, 111 N. Hope St., Los Angeles CA 90012
Mar 9	6 pm - 8 pm	Sepulveda Garden Center, 16633 Magnolia Blvd., Encino CA 91436

Input received from these public hearings will be considered in the preparation of the UWMP updates. The final 2015 UWMP is anticipated to be presented to the LADWP Board of Commissioners for adoption in early May 2016. LADWP plans to submit the 2015 UWMP to the California Department of Water Resources by July 1, 2016.

*The Public Hearing being held on March 3 can be viewed via a live webcast. A link will be available on the 2015 UWMP dedicated web page at www.ladwp.com/uwmp.

Contact Information

If you have any questions or concerns, please contact us by email at UWMP@ladwp.com

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LADWP Reliability Assessment Submittal to MWD

From: Dugan, Peter
Sent: Friday, February 12, 2016 10:06 AM
To: 'Fandialan,Edgar P'; Mike Ti (mike_ti@mwdh2o.com)
Cc: Kwan, Delon; Hsu, Chiun-Gwo (Simon); Almaraz, Jaime; Viramontes, Rafael
Subject: LA's 2015 UWMP Reliability Assessment

Edgar,

As part of LADWP's 2015 UWMP update process I am sending you a draft copy of our supply and demand assessment through FYE 2040, under single-dry, multi-dry, and average weather conditions. Please, forward this to any persons within MWD that you think should have a copy. If you have any questions feel free to contact Simon Hsu (simon.hsu@ladwp.com) or myself.

Thanks,

Peter Dugan
Water Resources
Los Angeles Department of Water & Power
Office: (213) 367-1192
peter.dugan@ladwp.com

Exhibit 11F
Service Area Reliability Assessment for Single Dry Year

Demand and Supply Projections (in acre-feet)	**Single Dry Year (FY2014-15) Fiscal Year Ending on June 30**				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	156,700	143,700	145,100	143,500	143,500
Los Angeles Aqueduct[4]	32,200	51,900	51,400	51,000	50,600
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	100	200	300	300	400
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	323,470	369,470	380,470	396,670	398,970
MWD Water Purchases					
With Existing/Planned Supplies	318,930	307,430	305,030	298,230	310,530
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	278,930	267,430	265,030	258,230	270,530
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**

[1] Total Demand with existing passive conservation

[2] Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.

[3] Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.

[4] LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.

[5] Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.

[6] Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Exhibit 11G
Service Area Reliability Assessment for Multi-Dry Years (2011-2015)

Demand and Supply Projections (in acre-feet)	**Multiple Dry Years (FY2012-13 to FY2014-15) Fiscal Year Ending on June 30**				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	156,700	143,700	145,100	143,500	143,500
Los Angeles Aqueduct[4]	33,500	53,200	52,800	52,400	51,900
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	100	200	300	300	400
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	324,770	370,770	381,870	398,070	400,270
MWD Water Purchases					
With Existing/Planned Supplies	317,630	306,130	303,630	296,830	309,230
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	277,630	266,130	263,630	256,830	269,230
Total Supplies	**642,400**	**676,900**	**685,500**	**694,900**	**709,500**

[1] Total Demand with existing passive conservation

[2] Cumulative hardware savings since late 1980s reached 118, 034 AFY by 2014-15.

[3] Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.

[4] LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.

[5] Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.

[6] Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Exhibit 11H
Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	**Average Weather Conditions (FY 1961/62 to 2010/11) Fiscal Year Ending on June 30**				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	125,800	110,900	111,600	109,100	108,100
Los Angeles Aqueduct[4]	275,700	293,400	291,000	288,600	286,200
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	400	800	1,200	1,600	2,000
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	536,370	578,770	587,470	601,170	600,770
MWD Water Purchases					
With Existing/Planned Supplies	75,430	65,930	65,430	60,630	74,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	35,430	25,930	25,430	20,630	34,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**

[1] Total Demand with existing passive conservation

[2] Cumulative hardware savings since late 1980s reached 118,034 AFY by 2014-15.

[3] Additional non-hardware conservation required to meet water use reduction goals set in the Sustainable City pLAn.

[4] LADWP anticipates conserving 20,000 AFY of water usage for dust mitigation on Owens Lake after the Master Project is implemented in FY 2023-24. Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.

[5] Net GW excludes Stormwater Recharge and Groundwater Replenishment supplies that contribute to increased pumping. The LADWP Groundwater Remediation project in the San Fernando Basin is expected in operation in 2021-22. Storage credit of 5,000 AFY will be used to maximize pumping in 2019-20 and thereafter. Sylmar Basin production will increase to 4,170 AFY from 2015-16 to 2038-39 to avoid the expiration of stored water credits, then go back to its entitlement of 3,570 AFY in 2039-40.

[6] Potential water transfer occurs in dry years with stored water acquired in average and wet years.

Public Informational Meeting Flyer

Los Angeles Department of Water & Power

2015 URBAN WATER MANAGEMENT PLAN

PUBLIC INFORMATIONAL MEETINGS

You are invited to attend one of four public meetings to learn about and provide feedback on the City's Urban Water Management Plan (UWMP).

TUESDAY, JANUARY 19, 2016

Metro Area
The California Endowment
9:00 a.m.-11:00 a.m.
1000 N. Alameda Street
Los Angeles, CA 90012

THURSDAY, JANUARY 21, 2016

Valley Area
Council District 3 Office
6:00 p.m. -8:00 p.m.
19040 Vanowen Street
Reseda, CA 91135

WEDNESDAY, JANUARY 27, 2016

West Los Angeles
Felicia Mahood Multipurpose Center
6:00 p.m. -8:00 p.m.
11338 Santa Monica Boulevard
Los Angeles, CA 90025

THURSDAY, JANUARY 28, 2016

Metro Area
LADWP Headquarters
6:00 p.m. -8:00 p.m.
111 N. Hope Street
Los Angeles, CA 90012

About the 2015 UWMP process:
The organizational structure of the 2015 UWMP will be similar to the 2010 UWMP. You may review the 2010 UWMP at www.ladwp.com/2010uwmp. The draft 2015 UWMP will be available for public comment in February 2016, prior to two public hearings being held in March 2016. The final 2015 UWMP will be presented for adoption by the LADWP Board of Commissioners in May 2016. The final UWMP will be submitted to the California Department of Water Resources in June 2016.

About the UWMP:
LADWP is in the process of preparing the 2015 UWMP for the City of Los Angeles. The 2015 UWMP will contain the City's long-term strategy for managing water resources and ensuring water supply reliability through the year 2040. The UWMP provides the framework for future reliability and also meets the State requirement for the City to submit a UWMP every five years in compliance with the California Urban Water Management Planning Act.

To RSVP for any of the above meetings, please email your name and selected meeting to uwmp@ladwp.com

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. To ensure availability, such requests should be made at least 72 hours in advance by calling (213) 367-3803, TDD: 1 (800) 432-7397.

Print Ads

WEDNESDAY, FEBRUARY 17, 2016

LOS ANGELES DAILY NEWS » DAILYNEWS.COM | NEWS A | 11

Los Angeles Department of Water & Power

2015 Urban Water Management Plan

Notice of Public Hearing

The Los Angeles Department of Water and Power (LADWP) will hold two public hearings on the Draft 2015 Urban Water Management Plan (UWMP). Public comments received at these meetings will be taken into consideration in the preparation of the final 2015 UWMP.

March 3, 2016
6:00 p.m.
LADWP Headquarters
111 N. Hope Street, Los Angeles, CA 90012
Webcast also available. RSVP to uwmp@ladwp.com.

March 9, 2016
6:00 p.m.
Sepulveda Garden Center
16633 Magnolia Blvd., Encino, CA 91406

Please visit www.ladwp.com/UWMP to review the 2015 Draft Urban Water Management Plan.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. To ensure availability, such requests should be made at least 72 hours in advance by calling (213) 367-3803, TDD: 1 (800) 432-7397.

Los Angeles Department of Water & Power

2015 Urban Water Management Plan

Notice of Public Hearing

The Los Angeles Department of Water and Power (LADWP) will hold two public hearings on the Draft 2015 Urban Water Management Plan (UWMP). Public comments received at these meetings will be taken into consideration in the preparation of the final 2015 UWMP.

March 3, 2016
6:00 p.m.
LADWP Headquarters
111 N. Hope Street, Los Angeles, CA 90012
Webcast also available. RSVP to uwmp@ladwp.com.

March 9, 2016
6:00 p.m.
Sepulveda Garden Center
16633 Magnolia Blvd., Encino, CA 91406

Please visit www.ladwp.com/UWMP to review the 2015 Draft Urban Water Management Plan.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. To ensure availability, such requests should be made at least 72 hours in advance by calling (213) 367-3803, TDD: 1 (800) 432-7397.

/LADWP @LADWP /LADWP1 /LADWP

8 | **La Opinión** MIÉRCOLES 17 FEBRERO 2016

#LosÁngeles
#WestCovina

Encuentran tres mujeres sin vida en Hawaiian Gardens
Tres muieres de origen asiático y con edades de entre 60 y 70 años fueron encontradas en una casa sobre la calle 223. Las autoridades encontraron un auto encendido y un fuerte olor a químicos.

Los Angeles LA DWP **Department of Water & Power**

Plan de Administración de Aguas Urbanas (UWMP) 2015

Aviso de Audiencia Pública

El Departamento de Agua y Energía de la Ciudad de Los Ángeles (LADWP) le invita a dos audiencias públicas sobre el Plan Borrador de Administración de Aguas Urbanas 2015 (UWMP, por sus siglas en inglés). Comentarios del público recibidos durante estas reuniones serán consideradas en la preparación del UWMP 2015 Final.

3 de marzo de 2016

6:00 p.m.
Oficinas de LADWP
111 N. Hope Street
Los Ángeles, CA 90012

Retransmisión por internet disponible.
Regístrese por correo electrónico a
uwmp@ladwp.com

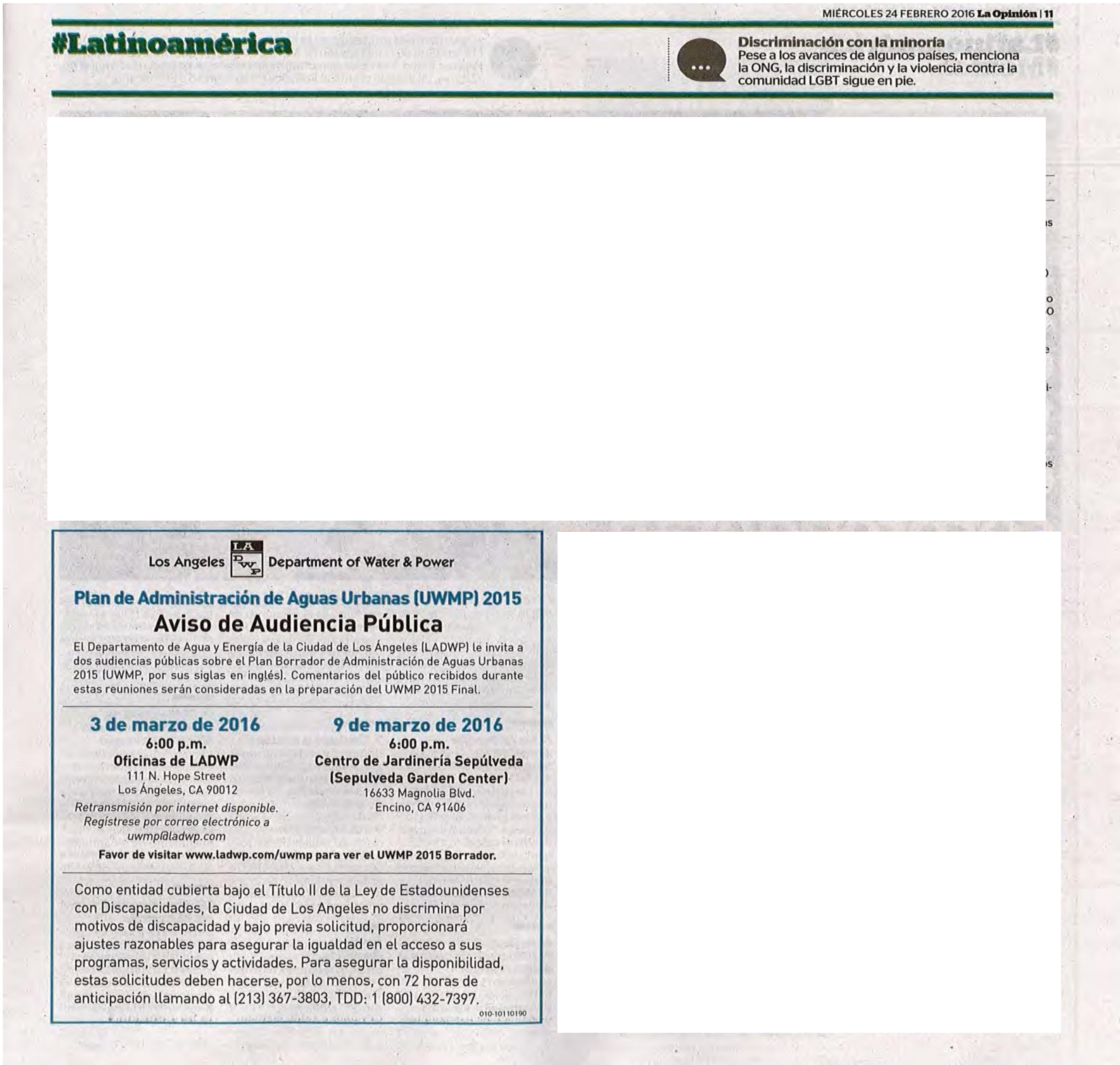
9 de marzo de 2016

6:00 p.m.
Centro de Jardinería Sepúlveda
(Sepulveda Garden Center)
16633 Magnolia Blvd.
Encino, CA 91406

Favor de visitar www.ladwp.com/uwmp para ver el UWMP 2015 Borrador.

Como entidad cubierta bajo el Título II de la Ley de Estadounidenses con Discapacidades, la Ciudad de Los Angeles no discrimina por motivos de discapacidad y bajo previa solicitud, proporcionará ajustes razonables para asegurar la igualdad en el acceso a sus programas, servicios y actividades. Para asegurar la disponibilidad, estas solicitudes deben hacerse, por lo menos, con 72 horas de anticipación llamando al (213) 367-3803, TDD: 1 (800) 432-7397.

010-10110189



MIÉRCOLES 24 FEBRERO 2016 **La Opinión** | 11

#Latinoamérica

Discriminación con la minoría
Pese a los avances de algunos países, menciona la ONG, la discriminación y la violencia contra la comunidad LGBT sigue en pie.

Los Angeles Department of Water & Power

Plan de Administración de Aguas Urbanas (UWMP) 2015

Aviso de Audiencia Pública

El Departamento de Agua y Energía de la Ciudad de Los Ángeles (LADWP) le invita a dos audiencias públicas sobre el Plan Borrador de Administración de Aguas Urbanas 2015 (UWMP, por sus siglas en inglés). Comentarios del público recibidos durante estas reuniones serán consideradas en la preparación del UWMP 2015 Final.

3 de marzo de 2016
6:00 p.m.
Oficinas de LADWP
111 N. Hope Street
Los Ángeles, CA 90012
Retransmisión por internet disponible.
Regístrese por correo electrónico a
uwmp@ladwp.com

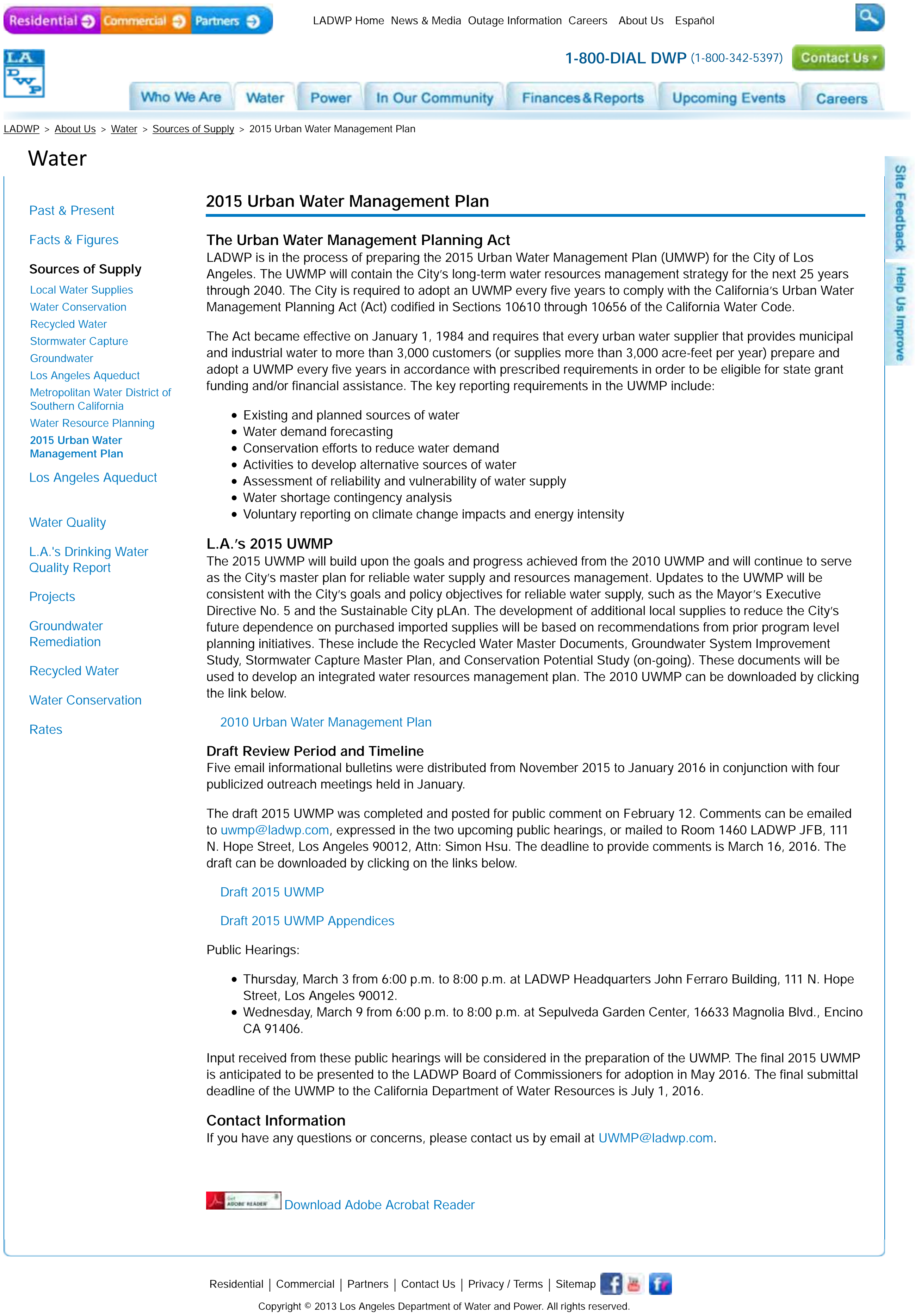
9 de marzo de 2016
6:00 p.m.
Centro de Jardinería Sepúlveda
(Sepulveda Garden Center)
16633 Magnolia Blvd.
Encino, CA 91406

Favor de visitar www.ladwp.com/uwmp para ver el UWMP 2015 Borrador.

Como entidad cubierta bajo el Título II de la Ley de Estadounidenses con Discapacidades, la Ciudad de Los Angeles no discrimina por motivos de discapacidad y bajo previa solicitud, proporcionará ajustes razonables para asegurar la igualdad en el acceso a sus programas, servicios y actividades. Para asegurar la disponibilidad, estas solicitudes deben hacerse, por lo menos, con 72 horas de anticipación llamando al (213) 367-3803, TDD: 1 (800) 432-7397.

010-10110190

LADWP UWMP Webpage



2015 Urban Water Management Plan

The Urban Water Management Planning Act

LADWP is in the process of preparing the 2015 Urban Water Management Plan (UWMP) for the City of Los Angeles. The UWMP will contain the City's long-term water resources management strategy for the next 25 years through 2040. The City is required to adopt an UWMP every five years to comply with the California's Urban Water Management Planning Act (Act) codified in Sections 10610 through 10656 of the California Water Code.

The Act became effective on January 1, 1984 and requires that every urban water supplier that provides municipal and industrial water to more than 3,000 customers (or supplies more than 3,000 acre-feet per year) prepare and adopt a UWMP every five years in accordance with prescribed requirements in order to be eligible for state grant funding and/or financial assistance. The key reporting requirements in the UWMP include:

- Existing and planned sources of water
- Water demand forecasting
- Conservation efforts to reduce water demand
- Activities to develop alternative sources of water
- Assessment of reliability and vulnerability of water supply
- Water shortage contingency analysis
- Voluntary reporting on climate change impacts and energy intensity

L.A.'s 2015 UWMP

The 2015 UWMP will build upon the goals and progress achieved from the 2010 UWMP and will continue to serve as the City's master plan for reliable water supply and resources management. Updates to the UWMP will be consistent with the City's goals and policy objectives for reliable water supply, such as the Mayor's Executive Directive No. 5 and the Sustainable City pLAn. The development of additional local supplies to reduce the City's future dependence on purchased imported supplies will be based on recommendations from prior program level planning initiatives. These include the Recycled Water Master Documents, Groundwater System Improvement Study, Stormwater Capture Master Plan, and Conservation Potential Study (on-going). These documents will be used to develop an integrated water resources management plan. The 2010 UWMP can be downloaded by clicking the link below.

2010 Urban Water Management Plan

Draft Review Period and Timeline

Five email informational bulletins were distributed from November 2015 to January 2016 in conjunction with four publicized outreach meetings held in January.

The draft 2015 UWMP was completed and posted for public comment on February 12. Comments can be emailed to uwmp@ladwp.com, expressed in the two upcoming public hearings, or mailed to Room 1460 LADWP JFB, 111 N. Hope Street, Los Angeles 90012, Attn: Simon Hsu. The deadline to provide comments is March 16, 2016. The draft can be downloaded by clicking on the links below.

Draft 2015 UWMP

Draft 2015 UWMP Appendices

Public Hearings:

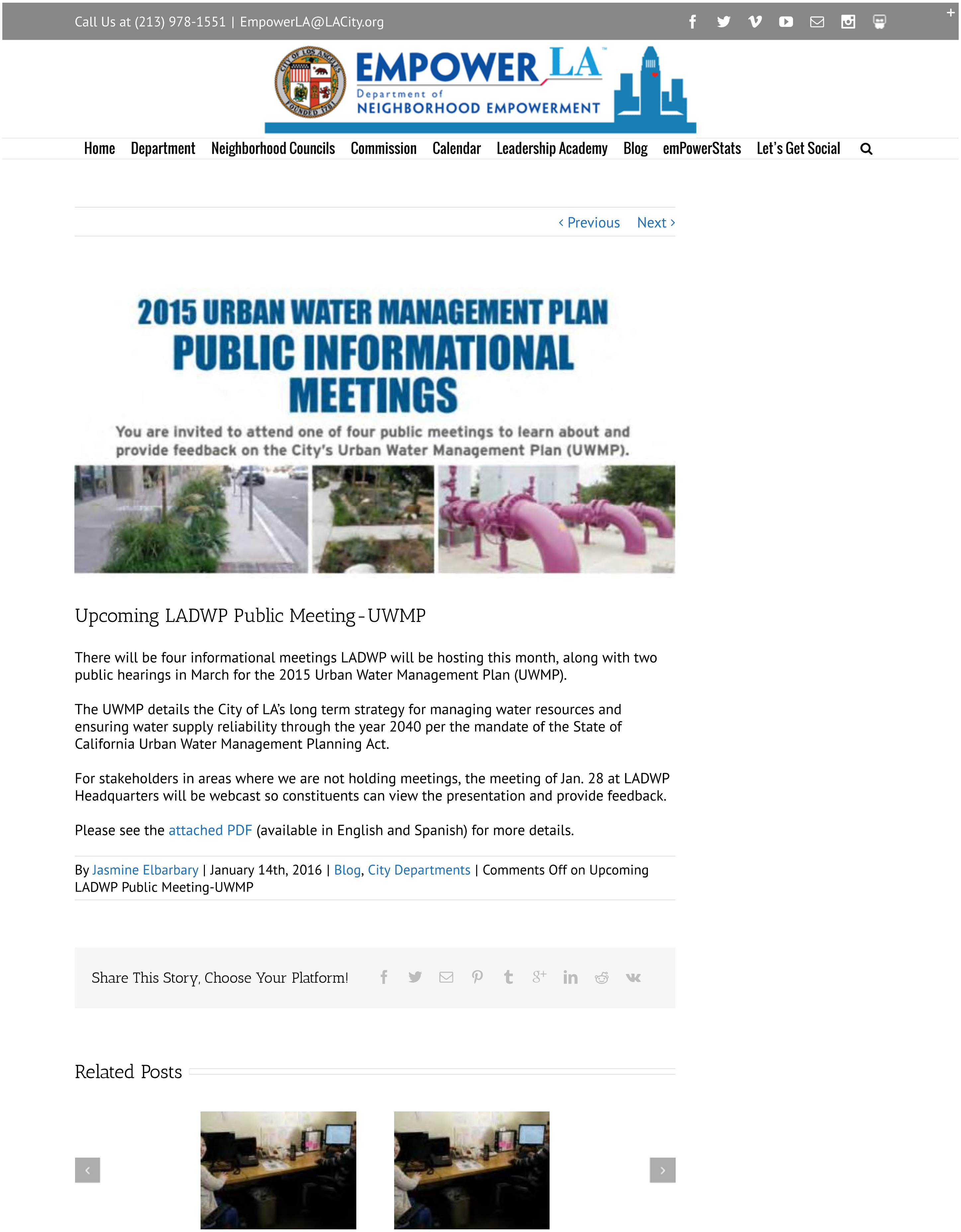
- Thursday, March 3 from 6:00 p.m. to 8:00 p.m. at LADWP Headquarters John Ferraro Building, 111 N. Hope Street, Los Angeles 90012.
- Wednesday, March 9 from 6:00 p.m. to 8:00 p.m. at Sepulveda Garden Center, 16633 Magnolia Blvd., Encino CA 91406.

Input received from these public hearings will be considered in the preparation of the UWMP. The final 2015 UWMP is anticipated to be presented to the LADWP Board of Commissioners for adoption in May 2016. The final submittal deadline of the UWMP to the California Department of Water Resources is July 1, 2016.

Contact Information

If you have any questions or concerns, please contact us by email at UWMP@ladwp.com.

Web Hits



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2015 URBAN WATER MANAGEMENT PLAN
PUBLIC INFORMATIONAL MEETINGS

You are invited to attend one of four public meetings to learn about and provide feedback on the City's Urban Water Management Plan (UWMP).

Upcoming LADWP Public Meeting-UWMP

There will be four informational meetings LADWP will be hosting this month, along with two public hearings in March for the 2015 Urban Water Management Plan (UWMP).

The UWMP details the City of LA's long term strategy for managing water resources and ensuring water supply reliability through the year 2040 per the mandate of the State of California Urban Water Management Planning Act.

For stakeholders in areas where we are not holding meetings, the meeting of Jan. 28 at LADWP Headquarters will be webcast so constituents can view the presentation and provide feedback.

Please see the attached PDF (available in English and Spanish) for more details.

By Jasmine Elbarbary | January 14th, 2016 | Blog, City Departments | Comments Off on Upcoming LADWP Public Meeting-UWMP

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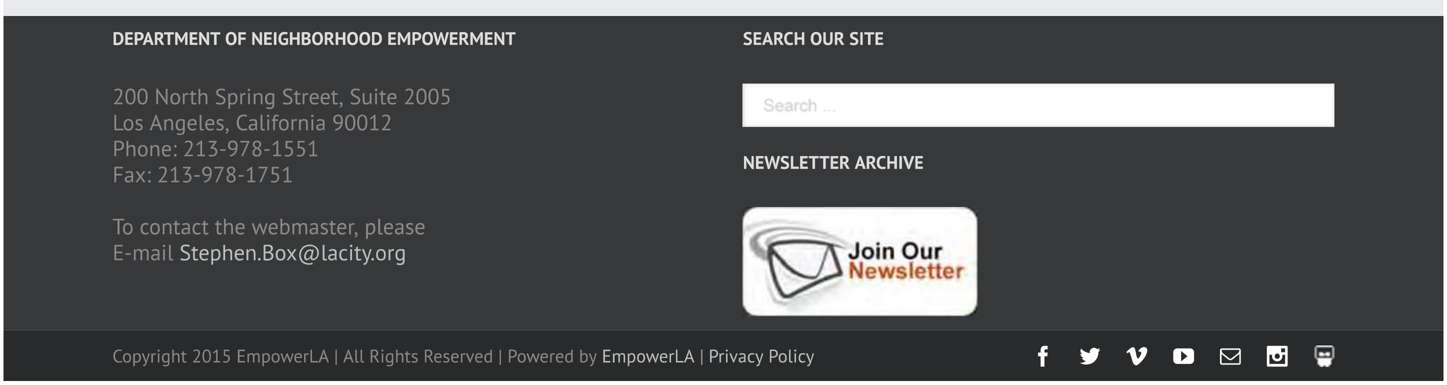

DEPARTMENT OF NEIGHBORHOOD EMPOWERMENT

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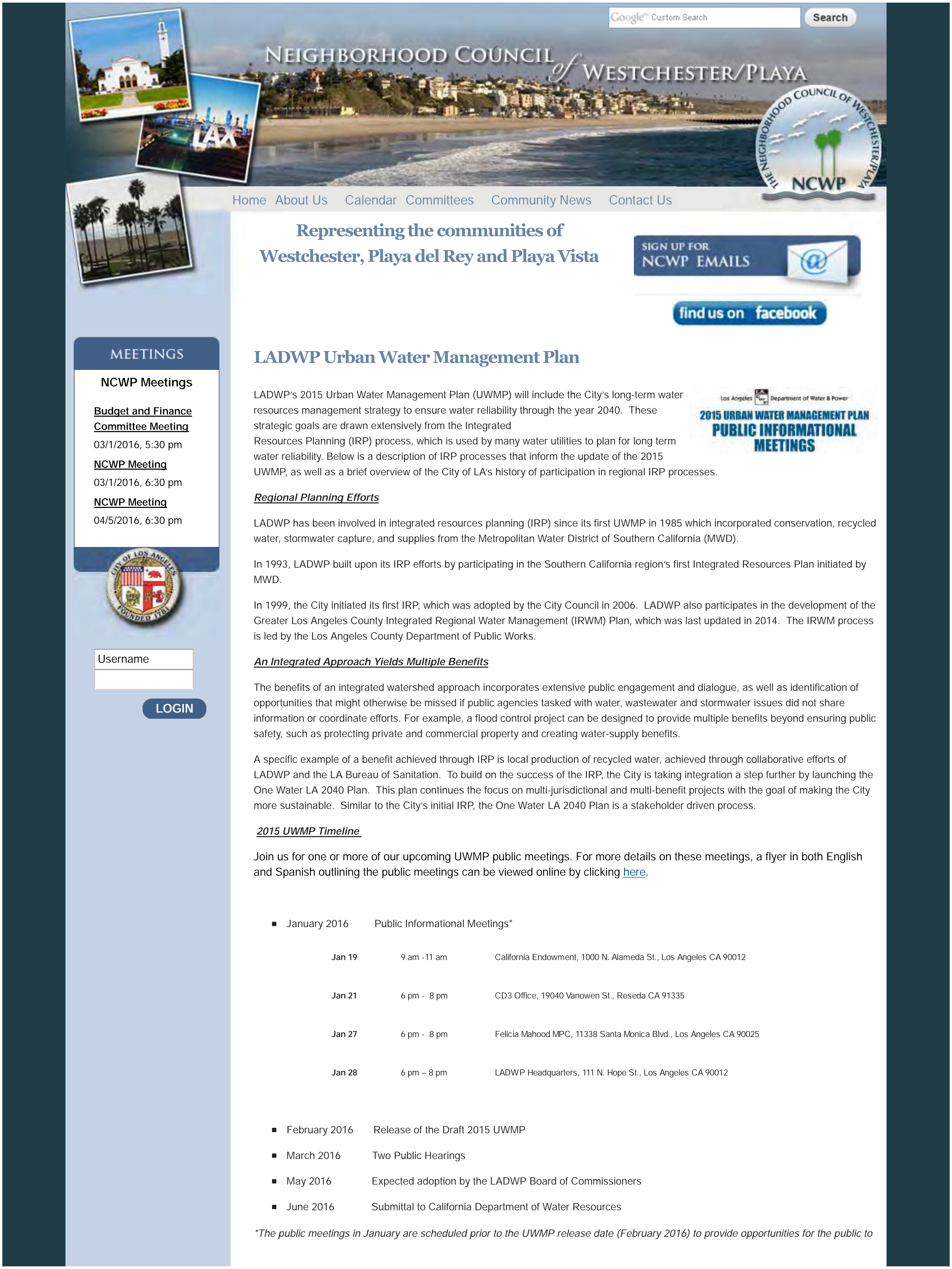

Representing the communities of Westchester, Playa del Rey and Playa Vista

NCWP Meetings

Budget and Finance Committee Meeting
03/1/2016, 5:30 pm

NCWP Meeting
03/1/2016, 6:30 pm

NCWP Meeting
04/5/2016, 6:30 pm

LADWP Urban Water Management Plan

LADWP's 2015 Urban Water Management Plan (UWMP) will include the City's long-term water resources management strategy to ensure water reliability through the year 2040. These strategic goals are drawn extensively from the Integrated Resources Planning (IRP) process, which is used by many water utilities to plan for long term water reliability. Below is a description of IRP processes that inform the update of the 2015 UWMP, as well as a brief overview of the City of LA's history of participation in regional IRP processes.

Regional Planning Efforts

LADWP has been involved in integrated resources planning (IRP) since its first UWMP in 1985 which incorporated conservation, recycled water, stormwater capture, and supplies from the Metropolitan Water District of Southern California (MWD).

In 1993, LADWP built upon its IRP efforts by participating in the Southern California region's first Integrated Resources Plan initiated by MWD.

In 1999, the City initiated its first IRP, which was adopted by the City Council in 2006. LADWP also participates in the development of the Greater Los Angeles County Integrated Regional Water Management (IRWM) Plan, which was last updated in 2014. The IRWM process is led by the Los Angeles County Department of Public Works.

An Integrated Approach Yields Multiple Benefits

The benefits of an integrated watershed approach incorporates extensive public engagement and dialogue, as well as identification of opportunities that might otherwise be missed if public agencies tasked with water, wastewater and stormwater issues did not share information or coordinate efforts. For example, a flood control project can be designed to provide multiple benefits beyond ensuring public safety, such as protecting private and commercial property and creating water-supply benefits.

A specific example of a benefit achieved through IRP is local production of recycled water, achieved through collaborative efforts of LADWP and the LA Bureau of Sanitation. To build on the success of the IRP, the City is taking integration a step further by launching the One Water LA 2040 Plan. This plan continues the focus on multi-jurisdictional and multi-benefit projects with the goal of making the City more sustainable. Similar to the City's initial IRP, the One Water LA 2040 Plan is a stakeholder driven process.

2015 UWMP Timeline

Join us for one or more of our upcoming UWMP public meetings. For more details on these meetings, a flyer in both English and Spanish outlining the public meetings can be viewed online by clicking here.

- January 2016 Public Informational Meetings*

Jan 19	9 am -11 am	California Endowment, 1000 N. Alameda St., Los Angeles CA 90012
Jan 21	6 pm - 8 pm	CD3 Office, 19040 Vanowen St., Reseda CA 91335
Jan 27	6 pm - 8 pm	Felicia Mahood MPC, 11338 Santa Monica Blvd., Los Angeles CA 90025
Jan 28	6 pm – 8 pm	LADWP Headquarters, 111 N. Hope St., Los Angeles CA 90012

- February 2016 Release of the Draft 2015 UWMP
- March 2016 Two Public Hearings
- May 2016 Expected adoption by the LADWP Board of Commissioners
- June 2016 Submittal to California Department of Water Resources

**The public meetings in January are scheduled prior to the UWMP release date (February 2016) to provide opportunities for the public to*

receive information and provide feedback.

To learn more about the Urban Water Management Plan, visit www.ladwp.com/uwmp or email uwmp@ladwp.com.

Site by Moore Business Results

Van Nuys Neighborhood Council

The Van Nuys Neighborhood Council meets on the second Wednesday of the month at 7pm. The General Meeting is held at 6262 Van Nuys Blvd.

Upcoming LADWP Public Meeting-UWMP

Upcoming LADWP Public Meeting-UWMP

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For stakeholders in areas where we are not holding meetings, the meeting of Jan. 28 at LADWP Headquarters will be webcast so constituents can view the presentation and provide feedback.

Please see the attached PDF (available in English and Spanish) for more details.

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This entry was posted in City information, Los Angeles Department of Water and Power (LADWP), Public service announcement on January 16, 2016 [http://vnnc.org/2016/01/upcoming-ladwp-public-meeting-uwmp/] by vnncadmin.

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UPCOMING EVENTS

MAR 1 Tue (http://www.venicenc.org/calendar-2/action~oneday/exact_date~3-1-2016/)

8:00 am Budget & Finance Committee Meeting (http://www.venicenc.org/event/budget-finance-committee-meeting/?instance_id=37562)

1:00 pm Board of Neighborhood Commission... @ Varies monthly; see text below (http://www.venicenc.org/event/bonc-meeting-2/?instance_id=37437)

6:00 pm Ocean Front Walk Committee Meeting @ Canal Club (http://www.venicenc.org/event/ocean-front-walk-committee-meeting-15/?instance_id=37632)

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January 21, 2016
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Official Correspondence should be emailed to secretary@venicenc.org

...nicenc.org/calendar-2/action~oneday/exact_date~3-9-2016/) ...org/event/32342/?instance_id=37629)

MAR 21 Mon (http://www.venicenc.org/calendar-2/action~oneda

1:00 pm Board of Neighborhood Commission... @ City Hall, 10th Floor Conference Center Room 1060 (http://www.venicenc.org/event/bonc-meeting/?instance_id=37514)

LADWP PRESENTS LONG-TERM WATER RESOURCES

WHEN:	January 28, 2016 @ 6:00 pm – 8:00 pm
WHERE:	LADWP Headquarters 111 N Hope St Los Angeles, CA 90012 USA
CONTACT:	Email (mailto:uwmp@ladwp.com) Event website (http://www.ladwp.com/ladwp/faces/wcnav_externalld/a-w-sos-uwmp)

Back to Calendar (http://www.venicenc.org/calendar-2/)

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LOS ANGELES–The Los Angeles Department of Water and Power (LADWP) is hosting four public outreach meetings this January to publicly present Los Angeles' preliminary long–term strategy for managing water resources and ensuring water–supply reliability through the year 2040, and is seeking input and comments from the public.

The final meeting is tonight. All LADWP customers and stakeholders are invited to participate and provide feedback at this meeting:

> **Thursday, January 28, 2016, 6:00 p.m. - 8:00 p.m.**
> LADWP Headquarters, 111 N. Hope Street, Los Angeles, CA 90012
> This meeting is also available via webcast. To access the webcast, RSVP to uwmp@ladwp.com.
> Instructions for webcast logon will be provided by email in advance of the meeting.

LADWP is updating its 2015 Urban Water Management Plan, and when completed, will offer a detailed discussion on the status of Los Angeles' imported water sources, and provide an update of future water supply and demand for the City based on the latest population and economic growth data. The plan is released every five years and contains updates to the long term management and development of water resource. The UWMP is a State requirement for compliance with the California Urban Water Management Planning Act.

To meet future water demand, the 2015 plan forecasts implementation of a diverse resource mix that includes increasing and further developing local water supplies in the areas of stormwater capture, conservation and recycled water. Addressing the contamination in the City's groundwater basin will also play critical role in the future. All of these components will help reduce the region's

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Board of Neighborhood Commissioners Meeting tomorrow at 6 PM at Alpine Recreation Center

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VNC Budget and Finance Committee Meeting tomorrow morning at 8 AM at Aroth Residence

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VNC Mass, Scale, and Character Committee Meeting tonight at 7:30 PM at Vera Davis Center

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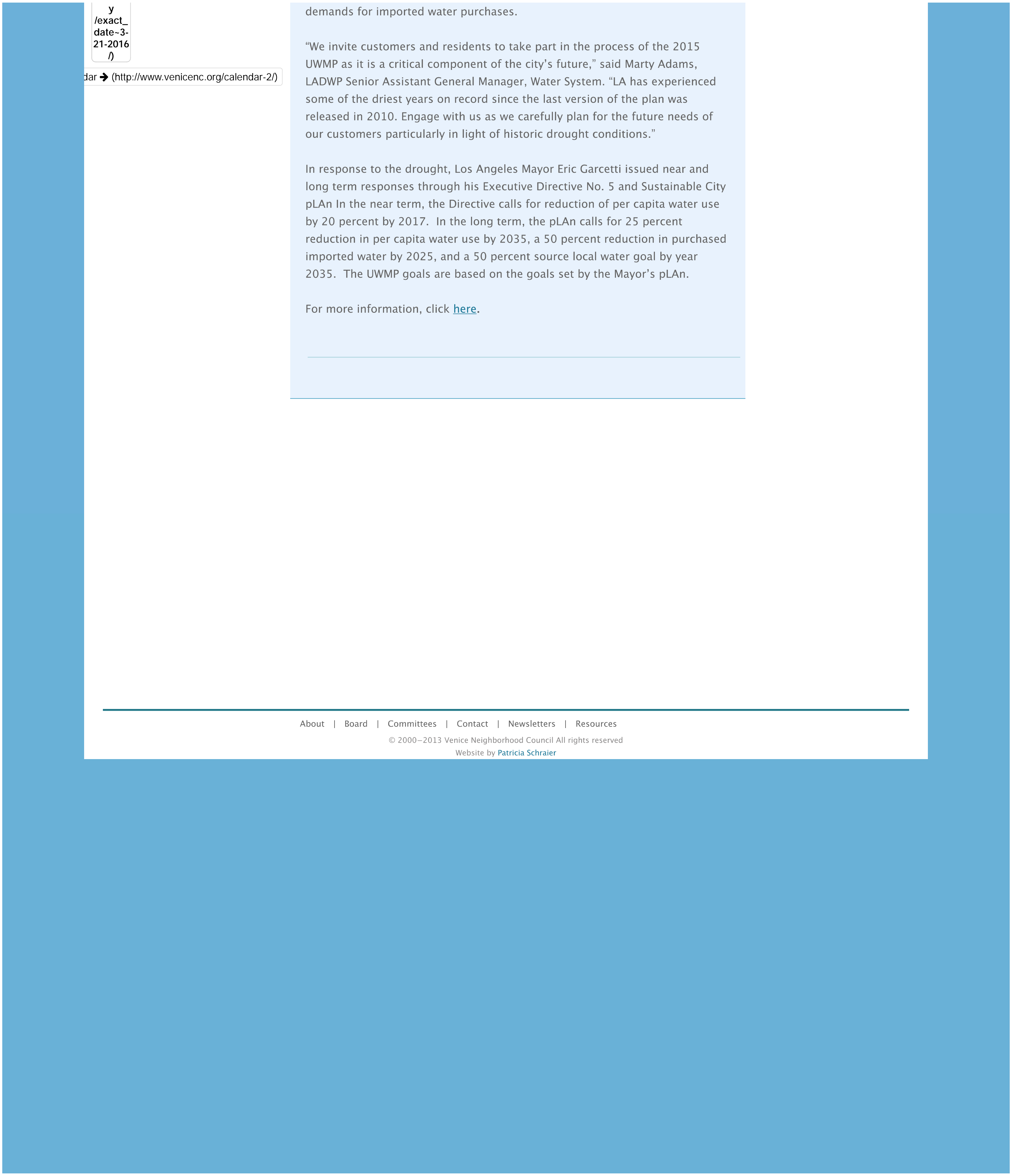

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demands for imported water purchases.

“We invite customers and residents to take part in the process of the 2015 UWMP as it is a critical component of the city’s future,” said Marty Adams, LADWP Senior Assistant General Manager, Water System. “LA has experienced some of the driest years on record since the last version of the plan was released in 2010. Engage with us as we carefully plan for the future needs of our customers particularly in light of historic drought conditions.”

In response to the drought, Los Angeles Mayor Eric Garcetti issued near and long term responses through his Executive Directive No. 5 and Sustainable City pLAn In the near term, the Directive calls for reduction of per capita water use by 20 percent by 2017. In the long term, the pLAn calls for 25 percent reduction in per capita water use by 2035, a 50 percent reduction in purchased imported water by 2025, and a 50 percent source local water goal by year 2035. The UWMP goals are based on the goals set by the Mayor’s pLAn.

For more information, click here.

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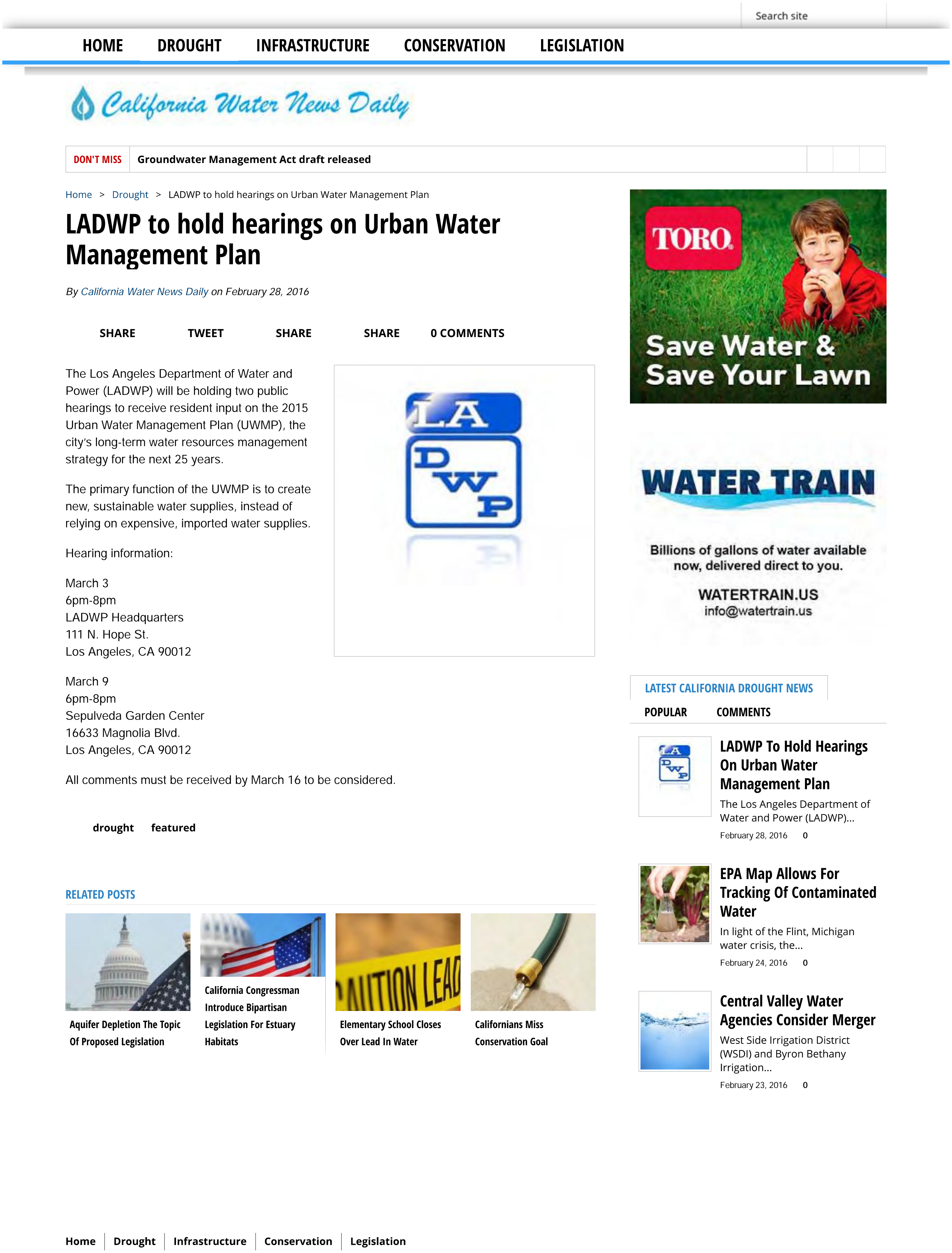

DON'T MISS Groundwater Management Act draft released

Home > Drought > LADWP to hold hearings on Urban Water Management Plan

LADWP to hold hearings on Urban Water Management Plan

By California Water News Daily on February 28, 2016

The Los Angeles Department of Water and Power (LADWP) will be holding two public hearings to receive resident input on the 2015 Urban Water Management Plan (UWMP), the city's long-term water resources management strategy for the next 25 years.

The primary function of the UWMP is to create new, sustainable water supplies, instead of relying on expensive, imported water supplies.

Hearing information:

March 3
6pm-8pm
LADWP Headquarters
111 N. Hope St.
Los Angeles, CA 90012

March 9
6pm-8pm
Sepulveda Garden Center
16633 Magnolia Blvd.
Los Angeles, CA 90012

All comments must be received by March 16 to be considered.

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Public Comments

Los Angeles Department of Water and Power

Summary of 2015 Urban Water Management Plan Public Informational Meeting Comments and Suggestions with LADWP Responses

Meeting 1: January 19, 2016, The California Endowment, 1000 N. Alameda St.

Meeting 2: January 21, 2016, Council District 3 Office, 19040 Vanowen St.

Meeting 3: January 27, 2016, Felicia Mahood Multipurpose Center, 11338 Santa Monica Blvd.

Meeting 4: January 28, 2016, LADWP Headquarters, 111 N. Hope St.

Conservation:

1. **Comment:** Which conservation program do you anticipate to be the most productive?

   Response: LADWP is currently performing a study to determine the conservation potential within each customer category and recommend specific cost effective programs to be implemented. The study includes telephone and online surveys with onsite verification and audits. With this data, we will create a Water Conservation Potential Model to find out the saturation of appliances and estimate future customer adoption rates. The preliminary results from the surveys and audits indicate that both landscape and clothes washers are showing a good amount of opportunity while the single family toilets are fairly saturated. The final results and recommendations of the study will help LADWP determine a cost-effective conservation strategy to meet aggressive long-term goals. Please refer to section 3.3 for further detail.

2. **Comment:** How does the conservation ordinance relate to public facilities, i.e. parks and golf courses?

   Response: The requirements of the ordinance apply to all customers regardless if they are public or private entities. Only recycled water customers are exempt from the outdoor watering restrictions in the ordinance. Please see exhibit 3E and Appendix I for further detail.

3. **Comment:** Is there a way that with part of the money you provide for turf removal, customers can be educated on proper watering practices for trees?

   Response: Current outdoor watering restrictions apply to automatic sprinklers only. Customers can still hand water plants and trees with a self-closing shut-off nozzle on the hose as needed. We partner with non-profit groups to help water trees at Rec & Park facilities and provide grants to communities with a focus on outdoor landscaping. We have increased one-on-one workshops in addition to classroom training to educate homeowners about California Friendly landscape and are looking to expand our education program even more. For newly planted trees, we recommend planting sustainable trees that are used to our climate and will need less water. Please refer to section 3.2.4 for further detail.

4. **Comment:** What is the City's plan for maintaining areas that haven't been watered in 20, 30 or 50 years? I'd like to speak specifically about Silver Lake Reservoir. There are a lot of trees in that area that do not receive adequate irrigation and are dying.

Response: Like most open spaces, the trees at Silver Lake Reservoir rely only on rainfall and are not irrigated. We will forward your concern to the department's operations division for follow up.

5. Comment: Has the department looked at incentives to improve tree health?

   Response: We provide water conservation incentives for potable water savings. We will evaluate incentivizing specific tree watering devices that save water and promote tree health.

6. Comment: The Fletcher Pumping Station was re-landscaped with gravel and cacti and advertised that watering is needed only once a week. It is not a California Friendly plant.

   Response: We try to engage the community on the type of plants or landscaping available in that area. We have a variety of different pallets and we are trying to be efficient with watering and maintenance. Certain facilities set a goal to install maintenance independent landscape, and that may have been the case here.

7. Comment: How do future conservation goals compare to what we have done in the last three years?

   Response: Before the current drought, we achieved about 3,000 AFY of active conservation savings in new rebates per year. In the past two years during this drought, we increased our conservation to about 6,000 AFY in new rebates per year. Since 1990 we have achieved cumulative annual hardware savings of 118,000 AFY. Please see exhibit 3B for further detail.

8. Comment: For the conservation potential study surveys conducted, were participants selected based on landscape type and lot size?

   Response: Participants for the single family conservation potential study surveys were randomly selected to help prevent skewed data results. The survey did contain questions on landscape type and estimated size of the landscape to help estimate outdoor conservation potential. Please refer to section 3.4 for further detail.

9. Comment: How severe would the drought have to be to enter Phase VI of the Emergency Water Conservation Ordinance?

   Response: The implementation of Phase VI would be ordered by the Mayor with the concurrence of the City Council to cope with a 50 percent or greater reduction in water supplies. There are progressive phases and other triggers that would be initiated before entering Phase VI. We will continue to monitor supply and demand and have long-term and short-term plans to avoid getting to that point. Please refer to sections 11.4.1 & 11.4.8 for further detail.

10. Comment: Can LADWP work with Building and Safety to require inspection on permitted upgrades? What is LADWP doing to pull other city departments along to help achieve local supply goals?

Response: LADWP has been working with Building and Safety in plumbing retrofit enforcement since 1988. In addition, Building and Safety and LADWP are part of the Mayor's Water Cabinet. We work with Building and Safety to develop new strategies that will help conserve water on renovations. LADWP is also participating in One Water LA, which includes collaboration among other city agencies. Please refer to section 3.2.1 for further detail.

11. Comment: Are there any policy decisions that can be made by the City Council that could match the impact of low flush toilets in the '80s and '90s?

    Response: The Mayor's pLAn and ED 5 are the guiding documents that set current aggressive conservation targets. The Water Conservation Potential Study results and recommendations will be the key to identifying additional opportunities and potential direction for meeting the Mayor's targets.

12. Comment: How well is the 2/3 day a week watering working, and what kind of enforcement has taken place?

    Response: Last year, the Water Conservation Response Unit investigated more than 16,000 complaints. Only 97 fines were actually issued. Our customers have been adhering to the restrictions and watering landscape more wisely. Please refer to section 3.2.4 for further detail.

13. Comment: What is the conservation percentage goal and timeframe for residential turf removal?

    Response: The Potential Study results and recommendations will provide more details in the goals and timeframe. The Governor issued a goal to remove 50 million sq. ft. of turf statewide. In LA alone, we have already replaced over 43 million sq. ft. We are one of the few cities still offering turf rebates.

14. Comment: Use Neighborhood Councils as eyes and ears for conservation opportunities. Also, use Neighborhood Councils as "ombudsman" for people to qualify for and get rebates.

    Response: Everyone is welcome to send suggested conservation opportunities or any conservation related comments to waterconservation@ladwp.com. We will look into additional opportunities of partnering with Neighborhood Councils.

Stormwater:

15. Comment: What is LADWP's plan to capture stormwater along the LA River?

    Response: The Mayor has instructed city agencies to look at the adaptive management process for the LA River. A water focus group is being formed under the LA River Cooperation Committee to determine the needs of the river, and LADWP will be a part of this group.

16. Comment: What is DWP doing to ensure the protection of our watersheds? What other agencies are involved?

Response: We are involved in the Integrated Regional Watershed Management Plan, which is an integrated process focused on the protection of local watersheds. LA County Flood Control is involved along with other city agencies within the Greater Los Angeles Area. As the largest land owner in the Eastern Sierra we have minimized development there for the past 100 years. In turn it provides high quality of water to the Los Angeles Aqueduct. Please refer to section 10.2 for further detail.

17. Comment: Why aren't new developments required to construct large underground cisterns?

    Response: The City does have a Low Impact Development Ordinance which requires developments of a specified size to capture stormwater on-site. To support these requirements, we offer rebates for rain barrels and cisterns. Please refer to section 7.5.2.2 for low impact development. For rebates information please visit www.ladwp.com.

18. Comment: I propose LADWP make arrangements with Neighborhood councils to identify better turf removal locations available in their respective areas.

    Response: We are evaluating the watershed approach to turf removal, so that turf-rebate customers can also capture stormwater with a rain garden, and implement other low impact development practices. Please refer to section 3.2.4 for further detail.

19. Comment: Are there weather-based irrigation controllers that can account for the presence of rain barrels in the landscaping system?

    Response: The department is not aware of such devices. Through outreach programs we educate customers to adjust their irrigation behavior after installing a rain barrel.

20. Comment: Has LADWP considered the use of permeable asphalts on roads as a method to capture stormwater?

    Response: We see permeable pavement as an available tool, but one of the primary complaints with this technology is the buildup of sediments in the voids. In order for the asphalt to remain effective, intensive maintenance is required to remove the sediments.

21. Comment: What is the future distributed stormwater capture goal? Are you suggesting this is going to contribute between 68 and 114 thousand acre-feet (TAF)? How are you going to tell the public that 68 to 114 TAF is a result of rain barrels, cisterns and street-side stormwater capture?

    Response: Both centralized capture and distributed capture combined will help achieve the overall stormwater capture potential of 68 - 114 TAF estimated in the Stormwater Capture Master Plan (see Exhibits 7E & 7F in 2015 UWMP). Combined centralized and distributed recharge potential is 66 - 107 TAF. Distributed direct use potential is 2 - 7 TAF. Centralized capture facilities (i.e., spreading grounds, dams, reservoirs) are engineered features located in specific locations that capture large runoff flows when available, and subsequently deliver this runoff to spreading basins where it is infiltrated into underlying groundwater aquifers. Distributed capture projects are neighborhood level stormwater capture projects which include rain barrels, cisterns, green streets, and infiltration galleries. Please refer to section 7.3 for further detail.

22. Comment: Has anybody looked into recreating something like ancient cisterns found in other parts of the world, or is LA too overpopulated to have space for this type of device?

    Response: The City is developing stormwater capture facilities functioning similar to the type of capture facility you are referring to. For example, we installed dry wells for infiltrating about 100 AFY of runoff into the aquifer on Branford Street in Sun Valley. Another project is on Elmer Avenue where we put infiltration galleries under the street along with parkway basins. Some parcel-base applications like rain gardens and rain barrels were also installed at adjacent properties. This has reduced flooding and recharges the underlying groundwater basin. Please refer to case study “Sun Valley EDA Public Improvement Project” in section 7.5.2 for further detail.

23. Comment: Section 7.6 of the 2010 UWMP suggests more distributed water capture and groundwater recharge. Design and install standard sized, small-scale percolation wells for low-lying areas in gutters. Leverage Neighborhood Councils to identify locations, raise general and local awareness. For example, “Adopt a percolation well.”

    Response: The Stormwater Capture Master Plan, completed in 2015, developed program type alternatives for distributed capture. They include (1) on-site infiltration, (2) on-site direct use, (3) green street programs, (4) subregional infiltration, and (5) subregional direct use. These programs are described in Section 7.5. We welcome additional suggested projects which can be submitted at stormwater@ladwp.com. We will look into opportunities of partnering with Neighborhood Councils.

24. Comment: Need more collaboration/enforcement with Building and Safety. Many single family homes in my neighborhood are paving their entire front yards. Not as part of turf replacement, and contrary to Building and Safety city ordinance. This prevents percolation to the aquifer and aggravates heat islands. It would be in the best interest of DWP, and B&S, and the neighborhoods to push enforcement.

    Response: The City’s Low Impact Development (LID) Ordinance was adopted in May 2012, which is a set of site design approaches and BMPs that are designed to address runoff and pollution at the source. The City’s LID ordinance, enforced by other City departments, has significant benefits to stormwater capture because it requires that all development and redevelopment projects that create, add, or replace 500 square feet or more of impervious area to capture the three-quarter inch rain event for infiltration or reuse on-site. Single-family residences can comply in a more simple way by installing rain barrels, permeable pavement, rainwater storage tanks, or infiltration swales. LADWP’s rain barrel and cistern rebates also incentivize on-site stormwater capture. LADWP will continue working with other City departments to develop programs and code requirements to highlight water conservation through LID and installation of BMPs. Please refer to section 7.5.3.2 for further detail.

Recycled Water:

Summary of 2015 Urban Water Management Plan Public Informational Meeting Comments and Suggestions with LADWP Responses

25. Comment: Is there a more detailed plan of how you are going to achieve the recycled water goals? Also, with the more conservation we achieve won't we have less wastewater available for recycling?

    Response: LADWP will achieve its recycled water goals through a combination of non-potable reuse (NPR) projects and groundwater replenishment (GWR). For the 30,000 AF of GWR, we plan to deliver recycled water treated at Donald C. Tillman WRP to Hansen Spreading Grounds and Pacoima Spreading Grounds for recharging the groundwater basin. The Draft EIR will be released in 2016 and will have more detail. For NPR, we will be pursuing new customers and environmental uses to increase recycled water use. There may also be potential for direct potable reuse if existing regulations change. Section 4.4 of the 2015 UWMP identifies a list of recycled water projects that will help achieve these goals.

    Conservation affects wastewater flow to some degree since wastewater is only reduced by indoor water conservation. LADWP has begun to focus more on outdoor water conservation, which has no impact on wastewater flow.

26. Comment: Would it help the wastewater supply if more people transition from septic tank to sewer?

    Response: Yes, it will help. There is a statewide grant forthcoming for converting septic tank to sewer.

27. Comment: Do you have a sense of when the Direct Potable Reuse (DPR) regulations will come out?

    Response: The State has an expert panel looking into the feasibility of developing regulations for DPR. They are expected to be completed by the end of 2016. Once the studies are in place, it will take time for the regulators to evaluate that information and develop regulations.

28. Comment: How will GWR's treatment process be evaluated? We shouldn't need to build an advanced purification facility to achieve the goals of increasing local supply. Maybe there is a better way to treat the water to still meet public health requirements and meet our goals for water supply.

    Response: We are working with LASAN to determine the most cost effective way to protect public health and increase local supplies. It could be reverse osmosis, micro-filtration, or new technological advances. There is a precedent set in the Inland Empire, where they spread recycled water that has not undergone reverse osmosis and still meet public health protection. Advanced purification may not be required for GWR, but will most likely be required for DPR. In addition, regulations allow more recharge for GWR if the water is treated to a higher level. Costs, public acceptance, and political will all need to be considered in the evaluation of GWR's treatment process. Please refer to section 4.4.2 for further detail.

29. Comment: Where is the public in terms of acceptance of recycled water? Maybe we need to conduct a survey to see if people accept it.

Response: The City has made significant efforts to inform the public on the safety and importance of recycled water in order to encourage its acceptance. Over the past 7 years, LADWP staff has conducted presentations at Neighborhood Council meetings throughout the City and has made efforts to contact all of them by email. LADWP has developed a robust K-12 Outreach program which has presented to over 14,000 students and teachers since 2012. This year alone the K-12 program has presented to over 5000 students and teachers at 31 schools. City staff also attended multiple community events to answer questions the public may have regarding recycled water and local water supply development. At the center of the City's effort to encourage public acceptance of recycled water is the Recycled Water Advisory Group (RWAG), which is a diverse group of stakeholders that the City meets with regularly to plan and discuss the water recycling program. In addition, RWAG members have attended tours of both City facilities and neighboring facilities to see water recycling technology in operation. Please refer to section 4.4.5 for further detail.

30. **Comment:** Do you include discussion in the 2015 UWMP about DPR? Will we invest in DPR?

    Response: No, the plan includes 30,000 AF of recycled water purposed for GWR and the other 45,400 AF is for non-potable reuse. There is still uncertainty over the acceptance of DPR in California. Although we anticipate it becoming a viable water source someday, we have not included it in our current projections.

31. **Comment:** I recently became aware that we would be sending some of this recycled water to Las Virgenes. How much recycled water is actually going to be local water, as opposed to water that we will be importing from other water systems?

    Response: The City is actually planning to import recycled water from Las Virgenes rather than exporting it. Currently, majority of our recycled water comes from in-city treatment plants. We are investigating additional opportunities of using wastewater sources outside the City. Please refer to section 4.4.3 for further detail.

32. **Comment:** Why don't we enforce the use of recycled water instead of potable water for hydraulic fracturing?

    Response: The limiting factor on availability is location of the purple pipes.

33. **Comment:** It looks to me like you are projecting 75 TAF of recycled water. In 1990, the UWMP projected 32 TAF, 1995 UWMP projected 38 TAF, 2000 UWMP Projected 29 TAF, the 2005 UWMP projected 30 TAF, and the 2010 UWMP projected 59 TAF. At the beginning of the 2010 plan they suggested that by 2015 we would have 20 TAF. So far we only have about 8 TAF per year. Why does LADWP say that they are going to meet their recycled water goals when they have missed previous targets? Every EIR in the City uses this plan as an assurance that we will continue to provide for growth, but you are not meeting these targets.

    Response: UWMP presents projected supplies reflecting the City's priorities and the availability of funding and resources at the time of update. Actual implementation may deviate from projections due to unexpected changes from initial assumed conditions. In 2000, groundwater recharge with recycled water was set back due to poor public acceptance. Economic recession beginning in 2008 prompted budget cutback and delayed the implementation timeline. Unforeseen events such as these cause recycled water projects to be delayed. The recent multi-year drought prompted state and local elected officials to advocate the expansion of recycled water use. It also improved public acceptance of this supply option.

LADWP's 2015 UWMP projects 75,400 AFY of recycled water use by 2040. It includes 30,000 AF of GWR by year 2024. The remaining 45,400 AF is a combination of 29,000 AF of non-potable reuse, as outlined in the Recycled Water Master Planning Documents, and 16,400 AF of non-potable reuse from conceptual planning for projects that would be completed after 2025. We believe these targets are attainable given the wider support from State, City, and the public. Please refer to section 4.4 for further detail.

Groundwater:

34. Comment: Is it still the case that rather than remediate the contaminated soil in the San Fernando Basin, LADWP is going to invest in treating and filtering the water upon withdrawal from the basin?

    Response: Yes, our strategy is to pump groundwater, treat, and deliver the groundwater to our distribution system. Soil remediation is the responsibility of the site owner under the supervision of the regulators (i.e. EPA/LARWQCB).

35. Comment: The 2005 plan said you would pump 106,000 AF, but year after year groundwater production has been much less than that. Now you are saying that by 2024 you will pump 111,000 AF. The evidence does not give me a lot of hope that you will meet that. Why should I believe LADWP will meet its groundwater pumping goal?

    Response: San Fernando Basin (SFB) groundwater pumping was cut back due to contamination, which was not reflected in the 2005 UWMP projections. The projected pumping of almost 110,000 AFY to restore full water rights will depend on the completion of treatment facilities. We also believe that this level of pumping is sustainable due to the increased stormwater capture projects that will be completed for increased groundwater recharge. Please refer to section 6.11 for further detail.

36. Comment: The ULARA Watermaster Report said that the city is so built out that during an average year only gets around 25,000 AF of recharge. You quoted in your UWMP that you would be able to pump over 100,000 AFY. There is a huge delivery problem. The difference between what Utilities say they have access to and what they can actually deliver is called paper water.

    Response: According to the 2012-13 ULARA Watermaster Report, the average spreading operations by centralized facilities in SFB is about 27,000 AFY. Spreading is not the only component to sustain the proposed pumping of more than 100,000 AFY. There are other components such as the incidental distributed recharge (~35,000 AFY) and imported water used outdoor that infiltrates into groundwater basin (~42,000 AF in 2012-13). The Watermaster Report can be downloaded from http://ularawatermaster.com/

37. **Comment:** How far along is the San Fernando Basin remediation project, and what percentage of total supply do you expect groundwater to account for?

    Response: The Environmental Impact Report will be released soon. The remediation complex should be ready by 2021, assuming the funding and rate action are in place. By FYE 2040 we expect groundwater to be 24% of our average year water supply (see Exhibit 11E).

38. **Comment:** What is the cost of the Groundwater Remediation project?

    Response: The cost is in the $600 million range; a portion of the cost will be covered in the rate action.

Los Angeles Aqueduct:

39. **Comment:** What is the basis of the assumed supply reduction of LA Aqueduct due to climate change? Are impacts such as higher frequency of bigger storms captured in your projection?

    Response: LADWP conducted a climate change study to evaluate the potential impacts of climate change on the eastern Sierras Nevada and on LAA water supply. From this study we developed a long-term average runoff reduction factor that we applied to the LAA supply projections. The hydrologic cycle is also projected to become more variable, with years of higher than historical maximum runoff and other years with lower than historical minimum runoff. Although these extremes are not captured and reflected in the long-term LAA supply projection, a separate analysis was performed to evaluate how they could impact the infrastructure of the LAA and its ability to deliver water to Los Angeles. Please refer to section 12.1.2 for further detail.

40. **Comment:** Reductions in the Aqueduct have been more than just due to climate influence. Since 1987, there had been more than 50% cutback in LAA deliveries mainly because of environmental obligations. Are they considered in your projection?

    Response: Aqueduct deliveries have been impacted by environmental enhancement efforts in the eastern Sierras. Our projection accounts for future impacts from these projects. Please refer to section 5.6 for further detail.

41. **Comment:** Are there unintended consequences to lack of use of the Aqueduct in dry years?

    Response: We take advantage of low LAA delivery in dry years to perform required maintenance and get more maintenance done. There are no known damages that occur to the LAA system in dry years.

Costs / Funding:

42. **Comment:** How much are the local supply programs going to cost?

Response: The current 5-year rate action has funding elements to support and develop the local water supply programs.

43. **Comment:** Is LADWP thinking about pursuing funding from Cap and Trade or Proposition 1? Also, did the new rate action account for potential grant funding?

    Response: We have a group within the Water Resources Division that is dedicated to identifying, applying, and managing all grants and loans. We did not make the assumption that we would get outside funding in the rate action, unless already awarded. But the new rate structure includes a mechanism to refund monies to rate payers if the department has over collected.

Water Demand:

44. **Comment:** When comparing a single-dry year demand to average year demand, demand should go down, correct?

    Response: During dry weather, demand will typically go up due to factors such as increased irrigation and cooling tower requirements. As dry conditions persist, demand will decrease by implementing mandatory conservation to respond to supply shortage.

45. **Comment:** Does GPCD include all customer classes?

    Response: Yes, it includes residential (multi-family and single-family), commercial, governmental, and industrial customers.

46. **Comment:** What does LADWP do to control development, which increases demand for water?

    Response: Large development projects are reviewed and approved by the City Planning Department. LADWP does not direct the development of the City nor project the growth of the City. For those projects requiring a Water Supply Assessment, we have been successful in making developers go above and beyond code requirements to conserve water. Please refer to section 11.5 for further information on water supply assessments.

Alternative Supplies:

47. **Comment:** Are transfers going to be in the next UWMP? 2010 UWMP projected that by 2015 the City would be receiving 40,000 AFY, and that is not happening.

    Response: Transfer is categorized as a planned supply in 2010 UWMP and will be considered a potential supply in 2015 UWMP. Transfer requires advanced planning of acquiring and storing water in wet and normal years, then delivering of the stored water when needed. In light of the 2 multi-year droughts in the last decade, transfer becomes less reliable than expected. If we could build up a reserve through a few good wet years, transfer still has a great potential to provide water in times of supply shortage. Please refer to section 9.1 for further detail.

General:

48. **Comment:** Does the plan have a provision taking into account future innovations that will help us meet water demands?

    Response: The UWMP is updated every 5 years to reflect current conditions and adjustments to water resources management strategies. Any innovations used by the City will be reflected in the future plans.

49. **Comment:** There doesn't seem to be any mention of infrastructure, are you handling these issues separately?

    Response: Infrastructure reliability is discussed in the Water Infrastructure Plan. This plan is posted on the LADWP website and can be downloaded at
    http://www.ladwp.com/docs/OPLADWPCCB421332.

Los Angeles Department of Water and Power

Summary of 2015 Urban Water Management Plan Public Hearing Meeting Comments and Suggestions with LADWP Responses

Meeting 1: March 3, 2016, LADWP Headquarters, 111 N. Hope St.

Meeting 2: March 9, 2016, Sepulveda Garden Center, 16633 Magnolia Blvd.

Conservation:

1. Comment: What was the rationale for measuring SBx7-7 compliance using and continuing with method 3? When comparing the 4 available methods, did method 3 set the lowest target?

   Response: No, method 3 does not set the lowest target. SBx7-7 is a State compliance requirement in order to stay eligible for State water grants and loans. LADWP is committed to protecting the interests of its rate payers, and therefore, selected method 3, which most fairly evaluates Los Angeles by accounting for historical conservation achievements and the demand hardening that results from increased conservation. Our Conservation Program began in 1977 and has saved over 118,000 AFY in hardware conservation. Method 3 compares to the hydrologic region target, which helps account for LADWP's historical savings achieved to date since we were an early adopter of conservation.

   LADWP recognizes the need to continue aggressively pursuing additional conservation. Through our efforts to meet the Mayor's Sustainable City pLAn (pLAn) goals, LADWP's current gpcd is already lower than any target set by SBx7-7. LADWP plans to continue meeting the pLAn's aggressive water use reduction goals, which are significantly lower than the 20x2020 targets and keep the City in compliance to the California Water Code requirements. Please refer to section 3.1.2 for further detail.

2. Comment: In the Water Conservation Potential Study, does the category "California Friendly/No Landscape" include hardscape (i.e. pavement, concrete, impervious surfaces)?

   Response: The Water Conservation Potential Study's objective is to identify the remaining conservation potential within the city. The category "California Friendly/No landscape" includes both dirt areas and paved areas to identify residential outdoor areas that do not have a water savings potential for LADWP's outdoor conservation programs. Please refer to section 3.4 for further detail.

3. Comment: In the Water Conservation Potential Study, did you do a study for dish washers in multi-family homes? Did you include dishwashers in the single-family home surveys?

   Response: The Water Conservation Potential Study did analyze dishwashers for both the multi-family and single-family sectors, and the findings will be presented in the completed Water Conservation Potential Study. Please refer to section 3.4 for further detail.

4. Comment: Has the Department looked at localized government control of terminating the use of water in toilets?

Response: Los Angeles has utilized ordinances as a tool to reduce water waste since 1988, with the adoption of its first version of a plumbing retrofit ordinance. In 1998 the ordinance was amended, requiring the installation of Ultra Low Flush (ULF) toilets and water-saving showerheads in single family and multi-family residences prior to the close of escrow. This progressive requirement is implemented with the help of local real estate professionals. Los Angeles further increased its water efficiency mandates in 2009 with adoption of the Water Efficiency Requirements Ordinance. This ordinance establishes water efficiency requirements for new developments and renovations of existing buildings by requiring installation of high efficiency plumbing fixtures in all residential and commercial buildings. Currently, the ordinance does not mandate waterless toilets due to feasibility and public health concerns. Please refer to section 3.2.1 for further detail.

5. Comment: Is graywater outside the purview of LADWP? Is graywater included in 2015 UWMP projections? Is there any department in the City that researches gray water systems?

   Response: Graywater systems can be implemented per the Department of Building and Safety's guidelines (http://www.ladbs.org/docs/default-source/publications/information-bulletins/plumbing-code/graywater-systems-for-residential-buildings-ib-p-pc2014-012.pdf). LADWP has a dedicated graywater website (www.ladwp.com/graywater) to educate customers interested in a graywater system. In addition, through its Technical Assistance Program, LADWP offers a rebate of up to $250,000 for customers who implement commercial graywater systems that reduce potable water use.

   LADWP researched multiple existing graywater studies and determined that the water savings findings were inconclusive. The full research report can be found at (https://cityclerk.lacity.org/lacityclerkconnect/index.cfm?fa=ccfi.viewrecord&cfnumber=14-1291). Currently, LADWP does not have a residential graywater program; however, we continue to monitor the graywater research. LADWP is working on additional graywater outreach material and focusing its limited Conservation budget on cost effective programs such as the residential turf removal rebate and water-efficient clothes washer rebate.

Recycled Water:

6. Comment: In regards to recycled water, are you recycling sewage straight from individual residents?

   Response: We are not recycling water on a parcel basis. We recycle wastewater at centralized facilities located at the City's four water reclamation plants. Please refer to section 4.2.1 for Recycled water facilities within Los Angeles.

Stormwater Capture:

7. Comment: What would trigger a move to the aggressive stormwater capture scenario? Does the rate increase help with funding stormwater capture?

Response: In general, we are moving forward with the Conservative Scenario in the 2015 UWMP. This Scenario is fairly aggressive when compared to our past and present stormwater capture investments. Had the rate action not occurred, even the conservative scenario would've been difficult to implement. The Aggressive Scenario was developed to display the additional potential of stormwater capture above and beyond the conservative scenario, however the development of these projects are not as well defined as compared to the conservative scenario such as reliance on land acquisitions, partnerships, ordinances, incentive programs, and community engagement, among others, that are outside of LADWP control.

The projects at Sheldon and Boulevard Pits are examples of potential stormwater capture projects that fall under the Aggressive Scenario. These are large projects that have the potential to yield a substantial amount of stormwater capture. There is a current mining operation at these locations; making them prime locations for implementing a stormwater capture project after the mining rights are exhausted. The uncertainties related to these types of project are the acquisition of land, finding potential partnerships, and funding; therefore, further work will be required in order to advance the implementation of these projects, and they've been categorized in the aggressive scenario for future potential to be developed.

8. Comment: Would the UWMP be a good place to inform the public of what it would look like financially to implement the aggressive vs. conservative stormwater capture scenarios prior to another potential rate increase?

   Response: Although the UWMP and the rate increase are guided by the same goals set by the Mayor, the UWMP is not the right forum for such discussion. Extensive public outreach has been done for the rate action which gave ample opportunity for the public to voice its opinion on such matters.

Groundwater:

9. Comment: How far away are we from having the San Fernando Valley aquifer 75% usable? I see it as a great shock absorber so you can put water in during wet years and take it out during dry years.

   Response: We expect to have the San Fernando remediation complex operational by 2021.

10. Comment: Do we have the technology and infrastructure to clean up the San Fernando Basin?

    Response: The technology is available. A recent milestone achievement was the completion of the Groundwater System Improvement Study (GSIS), which gives us a better characterization of the extent of the pollution, and a clear identification of the contaminants of concern. This will be the basis of designing remediation facilities. Please refer to section 6.2 for further detail.

Alternative Supplies:

11. Comment: What role does desalination play in your supply planning?

Response: We performed several studies in early 2000 and completed the Scattergood Seawater Desalination Pilot Project Preliminary Evaluation Report in 2008. At that time the City chose another route believed to have less environmental impact and is more cost effective. A decision was made to exhaust all local supplies, especially recycled water, before desalination is considered. The City has no plans over the next 25 years to develop desalination facilities. Please refer to section 9.3.4 for further detail.

Water Supply Planning:

12. Comment: It is reasonable to assume that a recurrence of the drought conditions experienced now, would affect all major Southern California Aqueducts (LA Aqueduct, State Water Project, Colorado River Aqueduct, etc.) at the same time. Given this, why do you expect the decrease in LA Aqueduct supply during dry year can be made up by increased imports from MWD? Where is MWD's water coming from?

    Response: The drought conditions in the watersheds of the 3 aqueducts don't necessarily coincide with one another. In 2015, Northern Sierra and Eastern Sierra experienced record low snowpack while Upper Colorado Basin still had about 80% of normal snowpack. In addition, MWD is also required to look at dry year hydrology impacting their sources of supplies on the CRA and SWP, similar to our analysis on LAA. MWD has developed supplies that can be called on during dry years and has played a pivotal role in developing the regional water storage in Southern California since the droughts of the early 90's. MWD has 1.5 MAF of storage rights in Lake Mead on the Colorado River and an in-basin reservoir storage capacity of 1.26 MAF that can be relied upon for regulating water supply through various hydrologic conditions. Please refer also to MWD's 2015 Urban Water Management Plan and 2015 Integrated Water Resources Plan updates.

13. Comment: Did you choose to include relevant climate science in your supply forecasts?

    Response: LADWP completed a climate change study in 2011 to address the possible challenges posed by climate change. The study evaluated the potential impacts of climate change on the Eastern Sierra Nevada watershed and on LAA water supply and deliveries. It also investigated opportunities to improve the LAA system in order to manage the potential impacts in the 21st century (Section 12.1.2). The study results are also incorporated in the LAA supply forecast (Section 11.2.1).

14. Comment: Do your projections reflect the assumption that the twin tunnels will be constructed in the Bay-Delta?

    Response: MWD assumes additional conservation, local supplies, and the California WaterFix will take place otherwise the member agencies will experience unacceptable level of shortage allocation frequency in the future. MWD projects 984 TAF of SWP supplies in the near term and 1.2 MAF of supplies on average starting in 2030 when the long-term Bay-Delta solution is assumed to be in place. For more details, please refer also to MWD's 2015 Urban Water Management Plan and 2015 Integrated Water Resources Plan updates.

15. Comment: What other local supply projects can make a significant increase in supply over the next 5 years?

Response: LADWP's local water supply program focuses on projects based on the conserve, capture, reuse strategy and SFB remediation, The UWMP outlines near-term purple pipe projects in Section 4.4.1 (Exhibits 4Q – 4T). Hinged on the completion of groundwater remediation complex, the groundwater replenishment (expected operational in 2023/24) and stormwater capture (projects listed in Sections 7.4 & 7.5) will recharge groundwater basins. These projects will raise groundwater levels and allow us to access stored water credits we have been accumulating over the last 40 years. Additionally, conservation savings will come from the recommendations of the Conservation Potential Study (Section 3.4).

Costs / Funding:

16. Comment: Is the rate increase addressing the need to build infrastructure? Is there a mechanism to reduce the rates for people on social security and low-income?

    Response: Yes, approximately 78% of the new water revenue from the rate action will support infrastructure for reliability and infrastructure for improvements to meet water quality regulations. LADWP offers discount rate programs to make water and electricity more affordable for qualifying families who are experiencing difficulties paying their bills. You may apply online at www.ladwp.com/lowincome or call 1-800-dialdwp (1-800-342-5397).

17. Comment: What is the status of getting Prop 1 funding for San Fernando aquifer clean-up? How can the public support you in getting Prop 1 funding?

    Response: The Prop 1 Groundwater Grant Program is currently being developed by the State Water Resources Control Board (State Board). Final guidelines are expected to be adopted in May 2016. The application period for the first round of funding is expected to open at the end of June 2016.

    In September 2015 LADWP submitted a preliminary application for $317 million in Prop 1 grant funding for the San Fernando Basin Groundwater Remediation Project (Project). Based on preliminary estimates, the Project is expected to cost about $635 million dollars. LADWP has been working diligently to review and comment on the Groundwater Grant Program as it is developed to ensure that the Project is well-positioned to compete for Prop 1 funding. LADWP has also been working to educate State Board members and staff on the importance of the Project and its relationship to the City's efforts to develop local water resources and reduce reliance on imported water. Interested members of the public are welcome to send letters to the State Board expressing support for the City's and the Mayor's efforts and reiterating the importance of the Project for the City, region, and state.

18. Comment: Has MWD given any money to LA to clean up the aquifer? How are you going to get funding for groundwater clean-up especially over the next 5 years since Prop 1 will not cover all the costs?

    Response: If eligible, we will pursue MWD's Local Resources Program designated for groundwater cleanup. The rate action will provide funding for part of the remediation project. Also, there is a potential for cost recovery from the PRPs (Potentially Responsible Parties), although this is not assumed in the current rate action. We will pursue every funding opportunity for groundwater clean-up to help reduce the cost.

19. **Comment:** I read about reports from concerned scientists that we are not going to get a lot of water from the Sierras and the Rockies due to climate change. I am more concerned about being able to capture water locally. I am worried about money going to the twin tunnels. We need to keep the money to fund local projects. Twin tunnels project is very corporate/agriculturally driven and very little for municipal use.

    Response: Majority of the proposed rate increase is strictly for local water supply development and infrastructure improvement. It does not go to pay for the tunnels. If MWD incurs costs in the future due to California WaterFix and raises its rates, the costs will be passed on the LADWP customers through the Water Supply Cost Adjustment for purchased water under the new Rate Ordinance. LA is trying to reduce its dependence on MWD purchased water, which should lower its share of contribution to the WaterFix.

20. **Comment:** I am concerned that the rate increase will syphon money from local projects and be spent on the tunnels proposed in the California Water Fix. Tunnels project is based on bad science. There is bond money for a simple fix of the Delta levee. I urge LADWP talk to scientists that don't agree with MWD. Please be aggressive in investing in distributed stormwater capture, graywater, recycled water, conservation efforts, and San Fernando aquifer clean-up. We cannot rely on snowfall in the Sierras and Rockies, with threat of climate change.

    Response: See previous response under comment 19.

21. **Comment:** Can you include language that stops the pass through cost of purchase water and explicitly prohibits any funds be spent on the tunnels?

    Response: That is outside the scope of the Urban Water Management Plan.

22. **Comment:** I disagree that we need to look to MWD for our supplemental water. We have potential here in Los Angeles to deliver 100% of our current water need. If we adopt the aggressive finance scenario over the conservation finance scenario, then we can dedicate what would have been 9 billion dollars earmarked investment for foreign imported water for our constituents in Los Angeles and not in the Central Valley for agriculture. I want to urge LADWP to include reference in their plan to define the tunnel project and make it transparent then oppose it and to promote harvesting of our local water that is cheaper and will keep us water independent in the future.

    Response: On average, MWD currently provides 57% of LA's water need. During extreme dry conditions such as in 2013-14, MWD provided 75% of LA's total supply or 442,000 AF. Reducing reliance on MWD's imported water is one of the Mayor's Sustainable City pLAn goal that is also incorporated in the 2015 UWMP. However, even with the additional conservation and planned new local supplies, the City will still need about 300,000 AF of water from MWD in dry years (see Exhibits 11F & 11G).

Water Demand:

23. **Comment:** I urge LADWP to use an independent and climate-base analysis to project future need.

Response: Climate change impacts to LA's water demand are discussed in Section 12.1.1. There is still general uncertainty within the scientific community regarding the potential impacts of climate change within the City of Los Angeles. LADWP continues to monitor the latest developments in scientific knowledge and will continue to assess future impacts of climate change on its water demand.

WRITTEN PUBLIC COMMENTS

Following are responses to written correspondences (attached) from Joel Shapiro, Grant Hoag, David Coffin, Melanie Winter, Casey Maddren, Deborah Weinstein Bloome, and Los Angeles County Metropolitan Transportation Authority.

Responses to Written Comments

Grant Hoag, Office of Public Accountability, 2/24/16

Comment: Exhibit ES-G and Exhibit 2D are inconsistent. The indoor/outdoor water use percentages need to be updated or qualified with potential shifts since 2010.

Response: Exhibit 2D was incorrect and has been revised to match Exhibit ES-G. Additional languages have been added at the end of Section 2.1.2 to explain that Exhibit 2D represents 2004 – 2007 average year conditions and period of time where there were no outdoor watering restrictions in effect. Since the drought response strategies are primarily geared towards outdoor water use, outdoor water use percentage will typically be lower during drought years than what is shown in Exhibit 2D.

Mr. David Coffin, 3/9/16

Comment: The LADWP 2015 Draft Urban Water Management Plan, like past UWMP's, continues to mischaracterize the city's availability of water by suggesting that it has access to water that it does not have access to. The draft is a thinly disguised effort to hide the city's low water supply levels from the planning process thus making the EIRs that rely on it susceptible to legal challenge.

Response:

As indicated in Footnote 1 of Mr. Coffin's letter, his analysis focuses exclusively on the average year assessments. In fact, LADWP believes that dry year assessments are more critical to water service reliability.

The UWMP Act requires that our projections include scenarios under average, single-dry, and multiple-dry years. Focusing only on average year projection is insufficient to plan for the uncertainty of the future. For example, the 2015 UWMP projects that LAA delivery will be 275,700 AF in average year by 2020 while the delivery can be as low as 32,200 AF in single-dry years (see Exhibits 11F & 11H). Each past UWMP conducted similar analysis with a range of supplies under various hydrologic conditions

We also include plans as required by the Water Code in response to the possibility of a water supply shortage. The City's Emergency Water Conservation Plan will be implemented to cope with up to 50% of supply shortage (see Section 11.3). The City is currently under Phase 2 of the Emergency Water Conservation Plan, restriction of outdoor water to 3 days a week, due to the supply shortage caused by the statewide drought.

A common misperception is that lower deliveries than projected supplies equate to insufficient supplies. The projection of supplies reflects what is necessary to meet projected demands. If actual demands are lower than projected demands, fewer supplies will be required accordingly. Any excess water supply is then held back in surface or underground storage for future deliveries. Conversely, if the demands are higher than the projections, the stored excess water can then be used to supplement supplies.

The UWMP is a planning document that analyzes various scenarios under their respective set of assumptions to plan for the future. Please see Section 11.2.8 for further detail on LADWP's service area reliability assessment. For new developments subject to CEQA and Water Supply Assessment under Water Code Section 10910, please refer to Section 11.5.

Comment: Conservation is not a supply. Conservation should be used to lower the baseline demand. Asserting that 'Conservation' is a water supply allows the department to manipulate the UWMP's supply projections, making it appear that the city's total available supply will be 611,800 AFY in 2020 and grow as high as 675,700 AFY by the year 2040.

Response: It is correct that conservation is used to lower baseline demand. Conservation is also treated as a supply and when combined with other supplies, all go towards meeting baseline demand. Please refer to Section 11.2.3 for further detail.

Comment: The aqueduct's actual average supply between 2007 and 2012 is just 207,670 AFY. The 2015 draft overestimates and projects long term supplies of up to 293,400 AFY.

Response: The 2010 UWMP projected that LAA deliveries could range from 48,520 AF to 105,777 AF each year under multiple-dry year conditions, and 252,000 under average conditions. There were 3 dry years, 1 normal year, and 1 wet year between 2007 and 2012 (see Exhibit 5D). Since that timeframe consisted of drier conditions, the average of actual deliveries is lower than the average year projection of 252,000 AF.

The 2015 UWMP projects that LAA supply can be as low as 32,200 AF in single-dry years. The 293,400 AF is projected for average year conditions. This was determined from a long-term statistical analysis of 94 years of historical LAA hydrology. Please refer to Section 5.6 for further detail.

Comment: The groundwater projections are over estimated. There is a large discrepancy when you compare the last 15-year average groundwater supply of just 74,390 AFY (2000 and 2015) with the drafts projections of 112,670 to 114,070 AFY.

Response: The long-term decline of groundwater production is due to groundwater basin contamination. LADWP has stepped up its efforts in addressing this problem and expects to have the San Fernando Basin treatment facilities operational by the end of 2021. Along with anticipated additional stormwater recharge and GWR for replenishment, the 2015 UWMP projects that we can recover our full pumping rights and access to the more than 500,000 AF of stored water credits. Please see Section 6.2 for further detail.

Actual groundwater operations can also deviate from projections. LADWP has operated its groundwater resources conjunctively with surface water supplies by reducing pumping during wet periods when more surface water is available and increasing pumping during dry periods to compensate for reduced surface water supplies. Please see Section 6.11 for further detail.

Comment: The department's history of meeting purple pipe projections suggests that they will not come close to meeting these new projections. Over the last eight years the department's average for Irrigation and Industrial use has been just ~7,500 AFY. LADWP missed the 20,000 AFY in 2015 by ~9,800 AF.

Response: The recycled water use was 10,421 AF in FY 2014-15. In 2000, the groundwater recharge project with recycled water was delayed due to poor public acceptance. Economic recession beginning in 2008 prompted budget cutback and further delayed the recycled water program implementation timeline. Unforeseen events such as these cause recycled water projects to be delayed. The recent multi-year drought prompted state and local officials to advocate the expansion of recycled water use. It also improved public acceptance of this supply option.

Comment: LADWP has consistently underestimated the amount of water purchased from MWD because LADWP claims it has access to large amounts of water it does not have access to.

Response:

Our demand on MWD varies depending on hydrology of the LAA, the development of local supplies, and conservation efforts. More LAA delivery in wet years, increased local supplies, and additional conservation will reduce our demand on MWD. LADWP coordinates closely with MWD through their IRP and UWMP updates in order to ensure that MWD can reliably provide water to all its member agencies in future dry years. Because of MWD's large investments in water storage, they are well equipped to provide water even in extended dry periods. In some cases when extreme drought persists, like the drought we are currently in, water supply allocations will take place. Please refer to Sections 8.1.3, 8.1.4, 10.3, and 11.2.6 for further detail

Melanie Winter, 3/16/16

Comment: On Page 7-21 - Woodman Ave case study, suggest 7 edits including:

- Remedy that The River Project was missing in the project description
- Delete "through pre-treatment devices" in the 3rd sentence of the 3rd paragraph. Stormwater flows from the street directly into the swale.
- Delete "and rip-rap" in the 2nd sentence of the 4th paragraph. There is river rock in places, but not rip-rap.
- Replace "groundwater" with stormwater, and delete "shallow in depth" from the second sentence of the 5th paragraph.
- In "The Benefits" section introductory paragraph, the use of a parenthetical is awkward - as is the use of 'whom.' Consider revising.
- In addition, the total AFY recharged is not mentioned anywhere on this page.
- Bullet points should be edited. Currently, two key benefits are jammed together in each of the first two bullets, and the last two bullets are redundant.

Response: The first 6 suggested edits have been incorporated. The redundancy of the bulleted benefits has been corrected.

Comment: On Page 7-7, acknowledge that The River Project is a Stormwater Capture Master Plan (SCMP) partner/supporter.

Response: The suggested edit has been incorporated in Section 7.3.2.

Comment: On Page 7-18 & Pages 3-24 through 3-17. Discussions of On-site Infiltration and On-site Direct Use, Residential Landscape Conservation, and the Watershed Approach neglect to reflect or acknowledge The River Project's substantial accomplishments, activities, and partnerships with LADWP on these issues. The Water LA Pilot has contributed significantly to advancements on these issues and the program is recognized in the SCMP and the Basin Conservation Study as a critical component of meeting local water goals.

Response: Additional language has been incorporated in Chapter 3 under Sustainable Landscaping to describe LADWP's partnership with The River Project.

Comment: The River Project has been working on stormwater capture for over 16 years, partnering with LADWP's Watershed Management Group and various agencies and departments in the development of the Tujunga Wash Feasibility Study in 2000, the Tujunga-Pacoima Watershed Plan in 2007, partnering on the Woodman Avenue Median in 2011, and developing the Water LA Pilot and Program in 2014, among others. Acknowledgement would be appropriate.

Response: The River Project's partnership with LADWP has been incorporated in Chapter 3 under Sustainable Landscaping.

Casey Maddren, 3/16/16

Comment: Rather than using factual information and realistic estimates to create a strategy for water use, the authors of the UWMP rely on wishful thinking with little in the way of factual data to support their assumptions.

Response: LADWP's supply and demand forecasts use historical data to set baselines for future projections. Adjustments are made to account for further changes in demographics, supply availability, supply development, and climate change to name a few. These adjustments come from a variety of internal and external planning documents and research reports. Please refer to Sections 2.3 and 11.2 for futher detail.

Comment: In order to lay the groundwork for any discussion of the future of our water resources, it's important to start with a discussion of the impacts of climate change on snowpacks in the Western United States.

Response: The LAA supply projection is based on actual data from 94 years of available hydrological records. Climate change impact to LAA delivery is also incorporated in the LAA supply projection. It is based on a 2011 study conducted to evaluate climate change impacts to Eastern Sierra Nevada watershed and LAA water supply. The study is summarized in Section 12.1.2. Climate change impacts to State Water Project and Colorado River supplies are discussed in Sections 12.1.3 and 12.1.4, respectively.

Comment: LADWP's 2015 UWMP relies on SWP and MWD projections that are far from certain. MWD can't count on consistent deliveries from the Colorado River.

Response: MWD's planning efforts are detailed in its 2015 IRP and 2015 UWMP. Please refer to the following documents for further detail. http://www.mwdh2o.com/PDF_About_Your_Water/2015_UWMP.pdf
and http://www.mwdh2o.com/Reports/2.4.1_Integrated_Resources_Plan.pdf

Comment: Under the heading Recycled Water Planning Efforts, the document refers to recycling projects that are in the "planning, design, or construction stage." But while a number of future projects are mentioned, almost all are currently in the planning stage. There is no detailed explanation of how much increased supply we can expect from these recycling projects. There is no timetable for building the necessary infrastructure. The UWMP does not identify the sources of revenue that will finance this infrastructure. This is crucial, since rate hikes are currently being planned merely to repair and upgrade existing water infrastructure. If we haven't even been able to maintain the current system, how can we depend on vague promises about future projects?

Response: UWMP is a long-term planning document. Summaries of individual recycled water project's use and service date are provided in Exhibits 4Q through 4T. From 2016 to 2020, LADWP plans to fund $565 million of recycled water projects through the recently passed rate action. Please refer to Section 4.4.4 for cost and funding regarding recycled water projects specifically. Summary of the 5-year local water supply costs can be found in the Water System Rate Action Report, Chapter 3, Figure 30, and at this link, https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-financesandreports/a-fr-waterrares/a-fr-wr-rateactionreport.

Comment: The idea that we can rely on the SWP/MWD system to furnish us with 40,000 AF every year for the next 25 years is absurdly optimistic. Even if they had the spare capacity, the cost would likely be prohibitive.

Response: In light of the recent statewide drought, LADWP's 2015 UWMP acknowledges that water transfers are a potential supply instead of a planned supply. This is shown Exhibit's 11F, 11G, and 11H.

Comment: How can anyone believe that local supplies are not influenced by variability of hydrology as asserted in the UWMP?

Response: LADWP's Local Water Supply Program consists of projects in conservation, groundwater, recycled water , and stormwater. Conservation can be achieved through prohibiting wasteful use of water and improving efficient use of water regardless of weather. Groundwater is managed through conjunctive use with surface water against the variability of hydrology (see Section 6.11 for more details). Recycled water is originated from indoor water use, which is not susceptible to variability of hydrology. Stormwater is highly dependent on hydrology. However, it is mostly captured during wet years for groundwater recharge and managed through our conjunctive use strategies for groundwater supply. Please refer to the section entitled, "Groundwater Basin Management and Sustainability" on page 6-3 for further detail.

Comment: LADWP does not have the funding lined up for SFB treatment plants.

Response: From 2016 to 2020, LADWP plans to spend a total of $378 million on groundwater programs. Majority of the investments will go to the San Fernando Basin Groundwater Remediation Project. Please refer to the Water System Rate Action Report, Chapter 3, Figure 30, and at this link, https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-financesandreports/a-fr-waterrares/a-fr-wr-rateactionreport

LADWP is also pursuing the Prop 1 funding. The Prop 1 Groundwater Grant Program is currently being developed by the State Water Resources Control Board. Final guidelines are expected to be adopted in May 2016. The application period for the first round of funding is expected to open at the end of June 2016. In September 2015 LADWP submitted a preliminary application for $317 million in Prop 1 grant funding for the San Fernando Basin Groundwater Remediation Project.

Deborah Weinstein Bloome, TreePeople, 3/16/16

Comment: Chapter 3. TreePeople would like to emphasize that updated requirements for residential landscaping rebate programs align with our, and our partner organizations', recommendations and should include; 0% artificial turf allowed, only biodegradable weed barriers allowed, and additional existing NGOs be listed as resources so that educational programming is equitably distributed city-wide.

Response: LADWP appreciates the opportunity to meet with organizations, such as TreePeople, Surfrider, and The River Project, to discuss strategies for promoting sustainable landscape transformations. We are currently in discussions with these advocacy organizations about how best to integrate additional strategies into our landscape rebate program. The conversations have been productive and we look forward to continuing the discussion.

Comment: Chapter 7. As partners with LADWP on the Stormwater Capture Master Plan (SCMP) we recommend using the aggressive scenario values presented on page ES-18 or explaining why there is a range between the two scenarios. Please also consider including language about what conditions are needed for aggressive milestones to be pursued.

Response: The 2015 UWMP stormwater capture goal reflects the Conservative Scenario. This Scenario is fairly aggressive when compared to our past and present stormwater capture investments. Had the rate action not occurred, even the conservative scenario would've been difficult to implement. The Aggressive Scenario was developed to display the potential of Stormwater Capture but the development of these numbers are reliant on land acquisitions, partnerships, ordinances, incentive programs, and community engagement, among others. Please see Section 7.3.4 for further detail.

The projects at Sheldon and Boulevard Pits are examples of potential stormwater capture projects that fall under the Aggressive Scenario. These are large projects that have the potential to yield a substantial amount of stormwater capture. There is a current mining operation at these locations; making them prime locations for implementing a stormwater capture project after the mining rights are exhausted. The uncertainties related to this project are the acquisition of land, finding potential partnerships, and funding.

Comment: As partners in the Greater Los Angeles Water Collaborative, we note that the LA StormCatcher project is mentioned on page 7-18; however the tank size information is incorrect. The LA StormCatcher tank sizes actually range between 420 and 1,981 gallons each. We recommend the following description to add more clarity and context: “while the cistern capacities range between 420 and 1,981 gallons, there are multiple tanks per site, and each system therefore ranges between 840 and 3,962 gallons.”

Response: These changes have been incorporated.

Comment: Chapter 9. How will LADWP balance investments in both large ticket centralized infrastructure and in the development of new water transfer programs against urgent needs for investments in local supplies like stormwater capture, which can be less energy intensive, more reliable, and can lessen impacts on the environment? Please explain the balance in investments to both traditional and newer, less centralized, technologies.

Response: LADWP currently categorizes water transfers as potential supplies. The primary focus under the 2015 UWMP is to develop planned local supplies. As a result, the majority of investments will occur in areas of stormwater capture, conservation, recycled water, and groundwater basin remediation. However, if economically-beneficial transfer supplies become available for storage or delivery, LADWP may also pursue these opportunities. Please see Section 9.1.1 for further detail.

Comment: Chapter 9. Given the costs and environmental impacts of desalination, we are encouraged by LADWP's prioritization of resources for enhancing local supplies, recycling, and conservation efforts. We caution LADWP's potential future exploration of desalination because it will divert investments and upgrades in local water supply technologies which can provide the water needed in LA with fewer environmental impacts and costs.

Response: LADWP does not plan to pursue ocean desalination at this time. Current long term planning under the 2015 UWMP is focused on local supply development. This focus will assist LADWP in complying with the Mayor’s Local Sustainable City pLAn, which provides long term requirements for local supply development. Please see Section 9.3.4 for further detail.

Comment: Chapter 11. The water contingency plan described in section 11.4 is very detailed, however it does not indicate how tree watering will be affected. Please include details on strategies for maintaining tree health in this report.

Response: Current outdoor watering restrictions apply to automatic sprinklers only. Customers can still hand water plants and trees with a self-closing shut-off nozzle on the hose as needed. UWMP is a water resource planning document and does not include detailed information on tree health. However, we appreciate Tree People’s suggestion and are considering adding information on keeping trees healthy during the drought on our website. We do emphasize the importance of maintaining tree health during a drought through various channels, such as our partnership with non-profit groups to help water trees at Rec & Park facilities, and provide grants to communities with a focus on outdoor landscaping. We have increased one-on-one workshops in addition to classroom training to educate homeowners about California Friendly landscape and are looking to expand our education program even more. For newly planted trees, we recommend planting sustainable trees that are adapted to our climate and will need less water.

Comment: Chapter 12. We want to highlight what we consider to be highly problematic language found in this chapter around projected climate change impacts, specifically, statements such as “there is still general uncertainty within the scientific community regarding the potential impacts of climate change within the City of Los Angeles” (p. 12-1) and “predictions of changes in precipitation are even more speculative” (p. 12-2). While the science behind projecting long-term climate impacts is highly complex and inherently uncertain, highly sophisticated research conducted locally in our region has given us valuable information that provides more clarity than what we believe is implied in this document. Furthermore, as much of the water used is Los Angeles is sourced from other parts of the state, climate change impacts experienced at water source origins will greatly affect water supply reliability in Los Angeles.

Response: LADWP has included climate change study results in Los Angeles Aqueduct supply projections for the 2015 UWMP and has also included climate change study results in service area demand scenarios. Additionally, Chapter 12 of the 2015 UWMP includes references to reports by the California Department of Water Resources (DWR) and the Metropolitan District of Southern California (MWD) which include strategies for managing the potential impacts of climate change on their respective supply resources. These resources, which LADWP has relied upon, include the State Water Project (owned and operated by DWR), the Colorado River Aqueduct (owned and operated by MWD), and MWD’s regional storage resources. LADWP will keep abreast of new studies as the science advances. Please see Section 12.1 for further detail.

Los Angeles County Metropolitan Transportation Authority, 3/16/16

Comment: This Plan mentions the Groundwater System Improvement Study (completed in February 2015) and calls out “high priority” chemicals of concern. The plan imposes stricter limits than the state government on the allowable amounts of such “high priority” chemicals in drinking water but does not make recommendations of how users of these chemicals should handle or dispose of them, nor does it call out specific remediation measures. Will the final version of the UWMP address disposal or remediation measures for the stricter limits?

Response: The final version of the UWMP will not address disposal or remediation measures for these limits. LADWP is proceeding with the necessary environmental reviews, design, permitting, construction, and startup of the groundwater remediation facilities to effectively remediate the SFB. Recommendations on how users of these chemicals should handle or dispose of these chemicals is not of the purview of the LADWP, but rather the purview of the applicable State regulatory agency (i.e. Department of Toxic Substance Control, Regional Water Quality Control Board and others) depending on the particular chemical and use.

Comment: How does the LADWP track the potential stormwater harvesting capacity for implementation strategies, such as rain barrels and cisterns, which are largely privately owned? Does it make a difference if owners are not trained about the use?

Response: We have kept track of the number of rain barrels installed throughout the City through the rain barrel rebate. We assume that during an average rain year, each rain barrel fills up a certain number of times. Based on this number, we come up with an estimated total rain barrel benefit for the City. We have not conducted research on the difference between trained and untrained owners. However, typically those who install rain barrels invest some of their own money and are highly motivated to harvest rainwater to reduce their potable water use. We have recently started a cistern rebate and are also studying the benefits of cisterns through a pilot project. We have partnered with TreePeople on this pilot project which installed 6 cistern systems throughout the City. These cisterns are currently being monitored for water supply benefits for potential wide-scale implementation. Please refer to Section 7.5.1.2 for further detail.

Comment: Without a measurement instrument for these water conservation strategies, how conservative or liberal is the calculation of onsite stormwater storage?

Response: The calculation for on-site direct use projects and programs is based on a variety of assumptions. It was assumed that on-site direct use would be implemented in regions where infiltration is not beneficial, and that there is a 100% impervious area within each parcel. It was also assumed that certain implementation rates for different land uses are used – these assumptions are based off of the Water Augmentation Study and the SCMP's Technical Advisory Team. A detailed description of assumptions is in the SCMP. The estimate in the SCMP of achieving 2,000 AFY by 2035 through on-site direct use is strongly reliant on factors outside of our control, including implementation of the LID ordinance and other incentives. Please see Stormwater Capture Master Plan website at http://www.ladwp.com/scmp for further detail.

Comment: Page 12-5 - What are the "*business-as-usual*" emission levels? Are these the levels for the County specifically or based on global projections?

Response: The "business-as-usual" emissions levels refer to projected greenhouse gas concentration trajectories defined by the Representative Concentration Pathway 8.5 (RCP 8.5) scenario, adopted by the United Nations Intergovernmental Panel on Climate Change for its Fifth Assessment Report (AR5) in 2014. RCP 8.5 represents the worst case of all scenarios in the AR5. RCP 8.5 was downscaled to represent the greater Los Angeles area for the UCLA study. For more details, see the UCLA study titled "Mid-Century Warming in the Los Angeles Region."

Comment: Page 12-5, first paragraph last sentence – *"..the most likely warming increase was projected to be somewhat smaller*." What is the actual definition of this "smaller" warming increase?

Response: The word "smaller" is used in reference to the degree of warming when comparing the "mitigation" scenario to the "business-as-usual" scenario. The comparison is general and is not meant to be defined quantitatively in the passage. For more details, see the UCLA study titled "Mid-Century Warming in the Los Angeles Region."

Comment: Page 12-5, second paragraph last sentence – What does 42,900 AF look like in regards to households/year or some other measurable comparison?

Response: One AF of water is enough to serve 3 households per year. 42,900 AF per year is enough to serve 128,700 households per year.

Comment: Page 12-6, first paragraph – "*It was found that there is a wide range of overall efficiency and resiliency within the existing system and that certain facilities are more readily adaptable to future changes than others.*" Are there factors that make certain systems and facilities more readily adaptable? Is it a location-based outcome?

Response: The reference is from Task 4, Final Report, Section 4.4 – Future Considerations of the LA Basin Study, http://www.usbr.gov/lc/socal/basinstudies/LABasin.html. The ability to adapt is based on an existing site specific characteristic.

From: Joel Shapiro
Sent: Friday, January 29, 2016 12:42 PM
To: UWMP; Joel Shapiro
Subject: Resident comment on long term H2O Plan

Hello LADWP,
I am a physician, home, business and property owner in Venice and Los Angeles. I am a 3rd generation "Los Angelian".

My simple comment is lets get off the addiction of imported water. Many civilizations have collapsed due to water issues. I hope we can be smart and avoid this....

...enough of the emotion...

I am sure you are aware we throw away into Long Beach Harbor, via the LA River, 440,000 acre-feet of water per year, while importing 660,000 acre-feet from the already overtaxed Colorado River, Sacramento Delta and the Owens Valley. Moving water around our State is also the largest single source of energy use in the California.

I am happy to see the Mayor's goal of 50% reduction of imported water by 2025, only 9 years away. This is ambitious and an excellent start.

We must use our vast intelligence to see how we can reuse all (but the needed trickle necessary for the aquatic ecosystem in Long Beach Harbor) the LA River water discharge. Perhaps a first pass is to clean it to a gray water standard and use in the lower part of the LA Basin. This would relieve the demand for water from that area. Can we also form some wetland/water reclamation projects as well?

Water is the survival issue of the future for Southern California.
I am certain, if we can go to the moon in the 1960's, we can solve this critical challenge.

Sincerely,
Joel Shapiro, M.D.
Founder Electric Lodge
Co Founder Arts Earth Partnership
Co Founder LA River Expeditions.

From: Grant Hoag
Sent: Wednesday, February 24, 2016 10:03 AM
To: Hsu, Chiun-Gwo (Simon)
Cc: Kwan, Delon; Dugan, Peter
Subject: Re: LADWP's DRAFT 2015 UWMP

Exhibit ES-G is wrong, and completely different than Exhibit 2D, which also appears incorrect. Specifically, there is no way that outdoor water use for Industry is 48% (Exhibit 2D); nor can outdoor water use for multi-family be 32% (Exhibit ES-G). While the problem is clear, the solution - not so much. I do like the methodologies used to identify the indoor/outdoor ratios.

Grant Hoag, P.E., Ratepayer Advocate
City of Los Angeles Office of Public Accountability

Follow-up telephone comments:

The indoor/outdoor water use percentages need to be updated or qualified with potential shifts since 2010.

March 9, 2016

Attn: Simon Hsu
Los Angeles Department of Water and Power
111 N. Hope St., Room 1460
Los Angeles, CA 90012

Subject: COMMENTS LADWP 2015 DRAFT URBAN WATER MANAGEMENT PLAN – *HIDING THE SHORTAGE*

It's important to emphasize the importance of the Urban Water Management Plan because every Environmental Impact Report uses this document to describe a projects impact on water. EIRs drawn up for every new project in the City of Los Angeles cite the future water supply data from the UWMP as evidence of sufficient future water supply for the project.

The LADWP 2015 Draft Urban Water Management Plan, like past UWMP's, continues to mischaracterize the city's availability of water by suggesting that it has access to water that it does not have access to. The draft is a thinly disguised effort to hide the city's low water supply levels from the planning process thus making the EIRs that rely on it susceptible to legal challenge.

To understand why the LADWP is doing this, we first need to remember that the Urban Water Management Plan is first and foremost a planning document.

The water supply totals found in the *Service Area Reliability Assessments* for Average, Single and Multi-Dry years found in the UWMP[i] are repeatedly cited in Environmental Impact Reports (EIR) as evidence of sufficient water supply to support the projects that are in the review process before the city planning department.

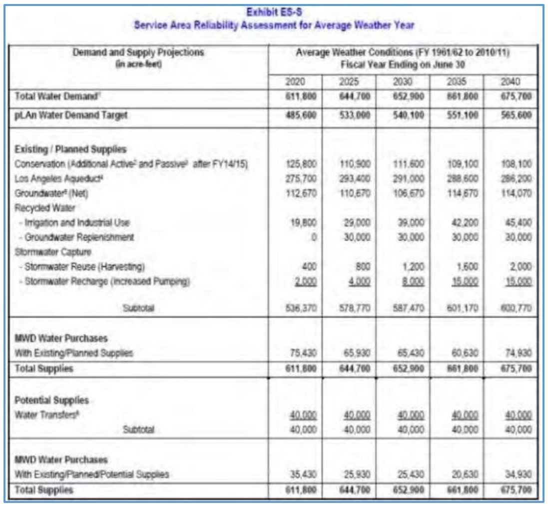


Exhibit ES-5
Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	Average Weather Conditions (FY 1961/62 to 2010/11) Fiscal Year Ending on June 30				
	2020	2025	2030	2035	2040
Total Water Demand[1]	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
pLAn Water Demand Target	**485,600**	**533,000**	**540,100**	**551,100**	**565,600**
Existing / Planned Supplies					
Conservation (Additional Active[2] and Passive[3] after FY14/15)	125,800	110,900	111,600	109,100	108,100
Los Angeles Aqueduct[4]	275,700	293,400	291,000	288,600	286,200
Groundwater[5] (Net)	112,670	110,670	106,670	114,670	114,070
Recycled Water					
- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400
- Groundwater Replenishment	0	30,000	30,000	30,000	30,000
Stormwater Capture					
- Stormwater Reuse (Harvesting)	400	800	1,200	1,600	2,000
- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000
Subtotal	536,370	578,770	587,470	601,170	600,770
MWD Water Purchases					
With Existing/Planned Supplies	75,430	65,930	65,430	60,630	74,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**
Potential Supplies					
Water Transfers[6]	40,000	40,000	40,000	40,000	40,000
Subtotal	40,000	40,000	40,000	40,000	40,000
MWD Water Purchases					
With Existing/Planned/Potential Supplies	35,430	25,930	25,430	20,630	34,930
Total Supplies	**611,800**	**644,700**	**652,900**	**661,800**	**675,700**

Conflicting Tasks

The LADWP has been faced with two conflicting tasks going back as far as 1985. The departments first task is to continue providing enough water to the city even while supply has fallen from an average of 680,000 Af/y to 610,000 Af/y due primarily to Court directed reductions of Aqueduct water.

Figure 1- LADWP has consistently padded water projections with water the department could not access.

To meet this task, the department has been a leader in stretching out water supplies using innovative hardware conservation strategies (low flow shower heads and toilets, water efficient washing machines, smart irrigation) and economic incentives (tier pricing), and education.

However, in conflict with this first task, the LADWP's second task is to provide *evidence of a growing water supply that is sufficient for continued growth*. The department wants to avoid at all cost, producing a document that suggests that the water supply is not scaling up with growth that city planners and elected officials want to achieve.

A close analysis of the department's historical supply data from the past twenty years, has shown conclusively that the departments actual real deliveries of water have consistently fallen far short of their projections. This leads to the conclusion that the projected supply figures found in the current draft and past UWMP's are at best, *very poor estimates,* or at worst, that the department has been *banking on paper water to promote the appearance of sufficient supplies*.

California's Urban Water Management Plan Act along with SB 610 and SB 221, requires that utilities update the UWMP every five years to demonstrate long term water supply availability before approving new projects[ii].

Over time this task has become tougher for the LADWP to prove as the city and the regions surrounding it grow, and various interests throughout the state assert their rights to the state's water supply. Compounding the problem, the department has never rejected Water Supply Assessments (WSA) citing insufficient water supplies for large projects that are subject to SB 610. Instead the department has always reported to planners and developers that there is sufficient water for growth despite the shortage.

In recent years, the LADWP has found that the sum total of aqueduct, groundwater, recycled water and MWD water was no longer enough to support the city's total supply requirement needed as evidence of sufficient growth. The department was also reaching the end of its credibility when it's aqueduct projections repeatedly exceeded 300,000 acre-feet per year (AF/y).

To solve this problem, the 2010 UWMP introduced new categories of supposedly new water. Some categories could result in real water such as stormwater capture and indirect potable reuse. But other categories were simply fuzzy water meant to artificially raise the total supply using paper water making it appear in EIRs that there would be long term surpluses available for growth. The 2015 Draft UWMP continues with this practice.

A Line-by-Line Analysis of the Draft UWMP's Future Water Supply Projections

The following is a review of the 2015 Draft UWMP with line by line analysis and comments of the supply projections found in the Draft's Service Area Reliability Assessments table for Average years. I'll show where the real water is and what's vulnerable to challenge.

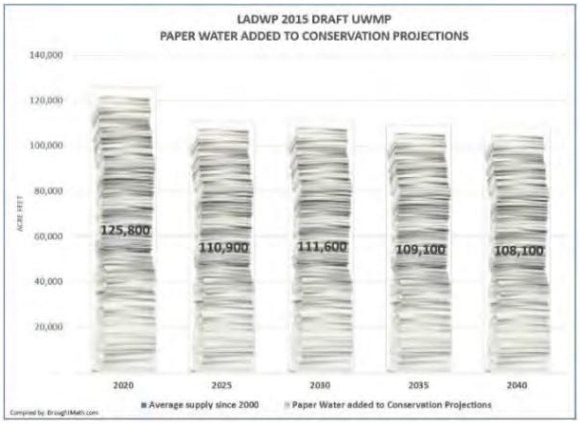
- **Conservation**

Plainly stated, *Conservation is not a supply.* Conservation should be used to lower the baseline demand. From there, the department should demonstrate how it will meet that.

Conservation (Additional Active[2] and Passive[3] after FY14/15)	125,800	110,900	111,600	109,100	108,100

Historically, the LADWP had always deducted conservation savings from the baseline demand side and from there, it calculated the required supply. However, because the falling aqueduct supply levels could no longer drive total supply above 700,000 AF/y to support an UWMP that was favorable to planning documents, the department shifted tactics in 2010 and began using Conservation as a 'supply' to artificially bump up the total supply figures.

The department's 2015 draft shows Conservation as an 'existing or planned supply' that will contribute up to 125,800 Af/y to the city's water portfolio. But simply put, this is 'paper water'. This is done to hide a portion of the total shortage the department doesn't want seen in Environmental Impact Reports that are attached to projects for review by the planning department.



There is a simple test to see if Conservation or any other category of water is real water or imaginary water. The **2009 California Water Plan Update**[iii] describes 'paper water' as water that *"utilities claim they have access to, but is difficult or impossible to access for various reasons"*.

Using that definition in our test, if we eliminate all of the city's real incoming sources of water such as the aqueduct, groundwater, recycled water, stormwater, and MWD water, and leave the city with only Conservation, how much water would the city have access to and available to use?

Answer: None. The 125,800 AF of 'water' in the Conservation category that the department claims it has access to is not accessible. You can't wash your hands with this water and you cannot sip it from a glass. Consequently, it's paper water and not a supply.

Asserting that 'Conservation' is a water supply allows the department to manipulate the UWMP's supply projections, making it appear that the city's total available supply will be 611,800 Af/y in 2020 and grow as high as 675,700 Af/y by the year 2040. When we remove this imaginary water from the table, the departments total projections fall to a dismal 536,370 Af/y ***(Figure 11)*** and over time it grows to just 600,770 AF/y by 2040. This is would fall more in line with the city's historical supply. *(**Figure 3**)*

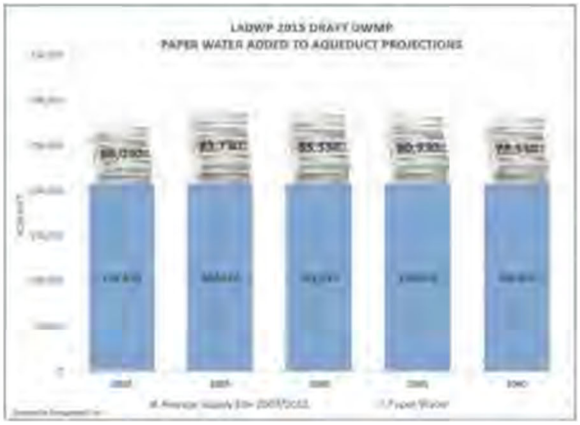
I'm sure the department sees another benefit to asserting that Conservation is a supply. It doesn't have to report the actual results like it does with real water from the aqueduct, groundwater, MWD, and recycled water which are all measured as they enter the water system.

Placing Conservation on the 'supply side' of the equation creates a fuzzy math scenario of future water supply that does not belong in planning documents that rely on the UWMP. The department is basically saying, *'If the public reduces it gallons per capita daily and meets 50% of the 'projected' conservation level, then that's like having 638,235 AF/y'* or *'if the public could meet 100% of the city's projected conservation level, it would be the same as reaching 675,100 AF/y'*.

- **Los Angeles Aqueduct**

Los Angeles Aqueduct[4]	275,700	293,400	291,000	288,600	286,200

The next item of 'existing or planned supplies' in the table is the Los Angeles Aqueduct. No longer does the LADWP find William Mulholland's engineering marvel worthy of top billing anymore even though it continues to be the city's largest owned producer of water in the city's supply portfolio. Instead it appears that the department wants the public's optics to be focused on 'Conservation' in the UWMP even though that's not real water like the aqueduct.



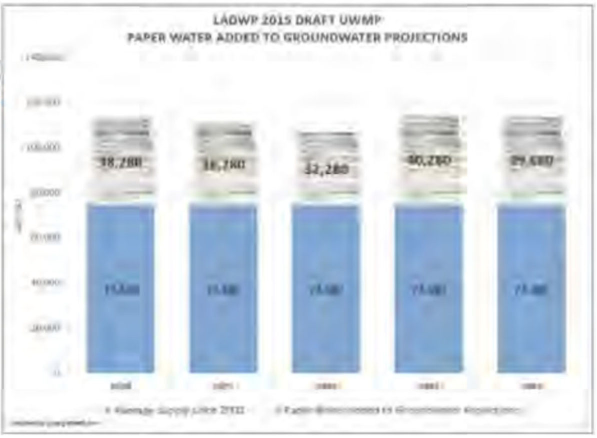
Using paper water, the Draft 2015 UWMP hides 68,030 to 85,730 AF/y of the city's total supply shortage in the Los Angeles Aqueduct projections. It does this by seriously over projecting how much water will be available through the aqueduct system.

The aqueduct's actual average supply between 2007 and 2012[iv] ***(Figure 4)*** is just 207,670 AF/y. The 2015 draft projects long term supplies up to 293,400 Af/y.

Given the aqueducts long term supply average and the permanent Court ordered environmental constraints on the aqueduct supply, there is no reason to believe that future aqueduct supplies will average higher than 227,000 Af/y. Even if the department is able to lower the amount of water needed to mitigate Owens Basin dust levels.

- **Groundwater**

Groundwater[5] (Net)	



The departments next major source of domestic water supply and third on the list of 'existing or planned supplies' is Groundwater. Like every UWMP before it, the Draft 2015 UWMP continues citing far more access to groundwater than the department really has access to.

This conclusion is made by comparing the last 15-year average groundwater supply of just 74,390 AF/y (2000 and 2015) with the drafts projections of 112,670 to 114,070 AF/y. Anything more than 74,390 AF/y is paper water which is used to bump up the total supply and hide the departments shortage in planning documents. ***(Figure 5)***

From a historical perspective, there is simply no evidence that the department will meet the year to year higher projections they cite in the current draft.

EIR's produced between 1995 and 2016 all cited UWMP projections claiming there would be sufficient water for their projects, in part because of the promise that future groundwater supply contributions would exceed 100,000 AF/y.

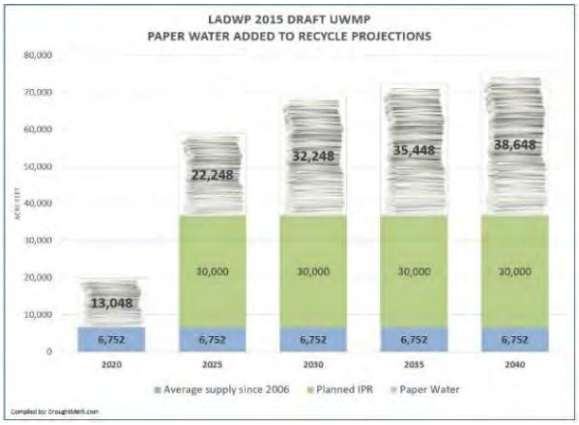
- **Recycled Water – Irrigation and Industrial**

Recycled water is next item in the 'existing or planned supplies' in the Draft 2015 UWMP. The department split the Recycle Water category between two sub categories back in 2010 and that continues today. They are 'Irrigation and Industrial Use' and 'Groundwater Replenishment'.

- Irrigation and Industrial Use	19,800	29,000	39,000	42,200	45,400

Irrigation and Industrial Use, better known as purple pipe is projected to contribute 19,800 AF/y of water into the city water system by 2020 and increase to 45,400 AF/y by 2040. However, the departments history of meeting purple pipe projections suggests that they will not come close to meeting these new projections either. Over the last eight years the department's average has been just ~7,500 AF/y. (***Figure 6***)

EIR's produced between 2010 and 2016 all cited the 2010 UWMP claiming there would be sufficient water for their projects, in part because of the 20,000 AF/y of recycled water distributed by purple pipe in the city's water system by 2015.



However, the department missed that mark badly with only ~9,800 AF of measured supply by September of 2015.

Earlier UWMP's promised that even more recycled water stating up to 29,000 AF/y would have been available by 2015.

Given that developing a more extensive purple pipe distribution system may not be cost effective over the long term, there is no reason to believe that Recycle Water-Irrigation and Industrial supply will exceed 15,000 Af/y over the next twenty-five years.

At this level, one can only conclude that the 2015 Draft UWMP uses this paper water in the Recycle Water-Irrigation and Industrial category to effectively hide up to 30,400 AF/y of the city's total supply shortage.

- **Recycled Water – Groundwater Replenishment**

- Groundwater Replenishment	0	30,000	30,000	30,000	30,000

The item on the 'existing or planned supply' supply table is Groundwater Replenishment. This is not expected to begin contributing the city's water portfolio until 2025. Groundwater Replenishment is a treated wastewater program known as Indirect Potable Reuse which is similar to Orange County's successful IPR program.

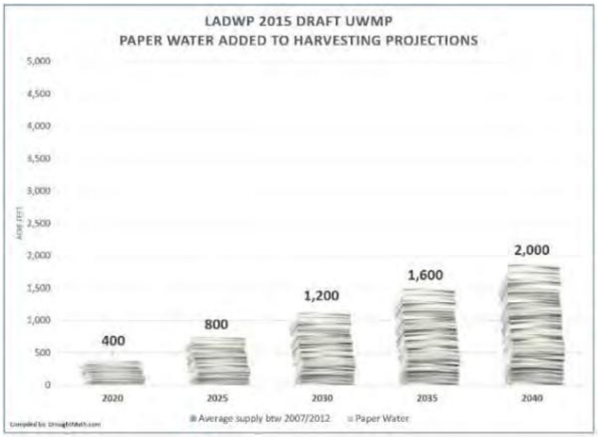
If the department is successful at rolling out Indirect Potable Reuse, this may turn out to be a real supply. How much we actually see entering the system on a year to year basis remains to be seen.

- **Stormwater Capture – Harvesting**

What was new to the 2010 UWMP but considered only a 'potential supply', Stormwater Capture has been undeservingly upgraded to a 'existing or planned supply'. Stormwater Capture is split between sub categories, Stormwater 'Reuse' and Stormwater 'Recharge'.

- Stormwater Reuse (Harvesting)	400	800	1,200	1,600	2,000

Stormwater Reuse (Harvesting), is the sixth ‘existing or planned supply’ in the table. Harvesting, is a paper water category consisting of Rain Barrels and Cisterns. The department claims that these components will be contributing 400 AF/y to the city’s water system by 2020 and will subsequently increase to 2,000 AF/y by 2040.



Over the last six years, projects working their way through the planning process claimed that they would have sufficient water supply to support them, in part because of the 2,000 AF/y of Harvested water that would be available to the city by 2015 and 10,000 AF/y by 2035. Development projects throughout the city parroted this claim in their EIR’s but the department could never measure it nor report it. ***(Figure 7)***

This category fits the definition of paper water because the department cannot access it. At best the department can only make assumptions about the quantity of water captured in rain barrels and cisterns. Such claims however are not suitable for planning documents such as environmental impact reports because they are based on guesses. The state generally recognizes supply only as water that can be measured as it enters the system.[v]

Rain barrels and cisterns are back yard, privately owned containers that do not have gages mounted to them that report back to the utility. *There is no way the LADWP can tell if they are actually in use, whether they’ve collected rainwater or if they have been repurposed for other uses*.

Given that Harvesting consists entirely of paper water, one can only conclude that the Draft 2015 UWMP uses in the Stormwater Reuse category to hide 400 to 2,000 AF/y of the city’s total supply shortage.

- **Stormwater Capture – Recharge**

- Stormwater Recharge (Increased Pumping)	2,000	4,000	8,000	15,000	15,000

Next on the list of ‘existing or planned’ supplies in the draft UWMP is Stormwater Recharge. Over the years the city has relied on ‘natural recharge’ in the San Fernando Basin for groundwater pumping, but this has severely decreased due to urbanization, led by the city’s thirst for high density development and road construction over permeable soil.

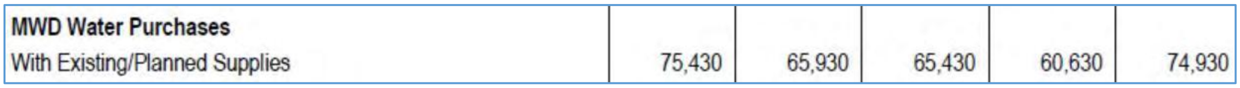
The LADWP intends to build an infrastructure in the San Fernando Basin that will capture up to 15,000 AF/y of water during intense rainwater events and allow it to infiltrate into to the ground much like natural recharge.

This may very well be another form of supply that is difficult to access given that is relies on rain events. For example, in both 2015 and 2016 it was predicted that El Nino would bring heavy rains to the Los Angeles area but that did not happen. Over the past three years, the drought has seriously reduced rainfall that would have contributed to both natural recharge and Stormwater Capture by way of recharge.

Furthermore, this new effort appears to be more about an effort to stem the further declines of groundwater shortage than to find new water. It could take decades before a payoff is seen if ever. ***(Figure 13)*** [vi]

Recharge will be subject to the same meteorological events that affect groundwater pumping where the latter has never met the long term projections found in past UWMPs. There is no guarantee that Recharge efforts will result in 15,000 Af/y supply until the program is in fully implemented and the long term averages can be measured as it enters the city’s water system. How much we actually see entering the system on a year to year basis remains to be seen.

- **MWD Water Purchases with Existing/Planned Supplies**



MWD Water Purchases With Existing/Planned Supplies	75,430	65,930	65,430	60,630	74,930

'MWD Water Purchases' is an interesting category because the department has consistently 'underestimated' how much it will buy from the Metropolitan Water District.

This happens because as previously noted, the LADWP claims it has access to large amounts of water it doesn't have access to. The department then has to make adjustments for the shortages by quietly purchasing additional water from the MWD.

The Draft 2015 projections are stunning given that it represents a 68% drop from the 2010 UWMP and worse, a projected 80% drop from the real purchases.

Between 2000 to 2015, the LADWP projected it would be purchasing an average of 220,881 AF/y from the MWD. But during this time the actual average supply it purchased from the MWD during that time was 47% higher at 325,570 AF/y. ***(Figure 12)***

This clearly demonstrates that the LADWP projections for MWD water have been seriously understated as a result of its supply projections being so full of paper water. The department's MWD projections are simply not reliable.

Given how much paper water is in this draft UWMP which includes the so-called 'Conservation', there is no evidence that the LADWP will be able to meet those projections and subsequently limit MWD purchases at this level unless city leaders intend to deliberately deepen the city's water supply shortage by plunging the city into a Phase IV or Phase V restrictions.

- **Transfers**

Water Transfers[6]	40,000	40,000	40,000	40,000	40,000

Over the last six years, EIR's for projects working their way through the planning process claimed that they would have sufficient water supply to support them, in part because 40,000 AF/y of Transfer water would be available to the city by 2015. However, the department was not able to access this water that so we can firmly place this in the category of paper water. ***(Figure 9)***

With the 'water market' turning increasingly bleak, the LADWP rightfully did not include Transfers as a 'Planned Supply' in the draft as it did in the 2010 UWMP. The department instead downgraded Transfers to a 'Potential Supply'. However, it still remains on the table making it 'appear' as if it is accessible to decision makers.

The chances that the department will have access to this water is fairly remote given that there no willing sellers in the Central Valley or Northern California and it's likely that the department would find itself bidding against the well-financed Metropolitan Water District.

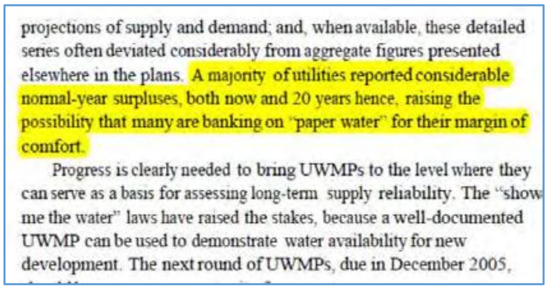
- **MWD Water Purchases with Existing/Planned Supplies and Transfers**

MWD Water Purchases With Existing/Planned/Potential Supplies	35,430	25,930	25,430	20,630	34,930

The tenth and last item in the Draft 2015 UWMP Services Area Reliability Assessment is an alternative MWD Water Purchase should the LADWP be able to secure contracts for water in the 'Transfer' category. It states that if the LADWP were to be able to secure contracts for 40,000 AF/y of Transfer water, this would result in lower MWD purchases amounting to ~20,630 to 35,430 AF/y. Should Transfers occur, it's unlikely that the MWD projections could be held this low for the same reasons described the '*MWD Water Purchases with Existing/Planned Supplies'* section above.

Charting LADWP's Use of Paper Water

To illustrate the LADWP's consistent claims of having access to water it cannot access, this analysis includes the following charts that clearly show the departments projected long term normal year surpluses in past UWMPs, against the actual total supply reported by the department. In a report *'Water for Growth'*, the author noted that this practice raises the possibility that these utilities are banking on 'paper water'. [iii]


projections of supply and demand; and, when available, these detailed series often deviated considerably from aggregate figures presented elsewhere in the plans. A majority of utilities reported considerable normal-year surpluses, both now and 20 years hence, raising the possibility that many are banking on "paper water" for their margin of comfort.

Progress is clearly needed to bring UWMPs to the level where they can serve as a basis for assessing long-term supply reliability. The "show me the water" laws have raised the stakes, because a well-documented UWMP can be used to demonstrate water availability for new development. The next round of UWMPs, due in December 2005,

Figure 2 – 'Hanak (2010): Water for Growth' suggests many utilities count on water used by others in state water system.

Paper water is water that the utility claims to has access to but cannot access it because it is used elsewhere in the state's water system. These charts demonstrate the fact that the LADWP has for decades, routinely padded its supply projection using paper water to bump up the perception of available water in the UWMP to avoid producing a document that will otherwise show shortages instead.

The LADWP's UWMP projections are routinely cited by Environmental Impact Reports for projects and developments seeking permits as evidence of sufficient water supply as they work their way through the city's planning department. The 'actual supply' amounts shown below demonstrate that the LADWP has been unable to meet these projections though out this entire period from 1990 through 2015.

LADWP Projections V. Actual Supply

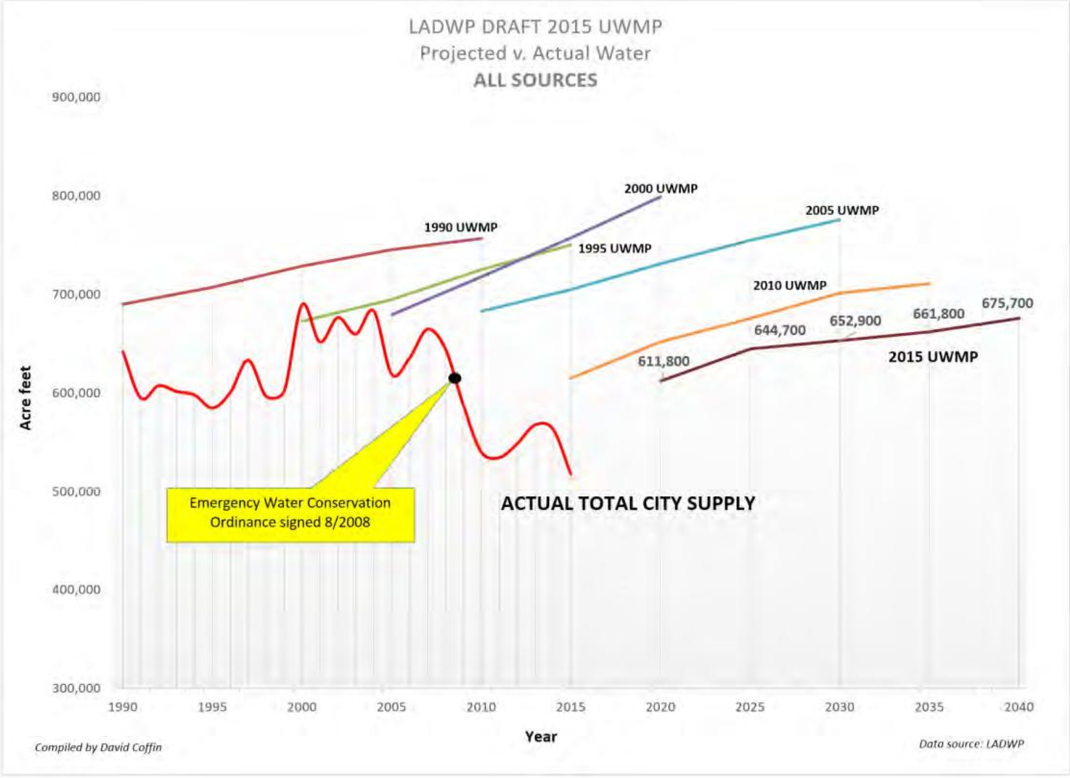


Figure 3 - Total City Water Supply - Year after year, decade after decade the LADWP has repeatedly exaggerated how much water would be available for future growth. The department was never able to access this water which resulted in an onerous Emergency Water Conservation Ordinance.

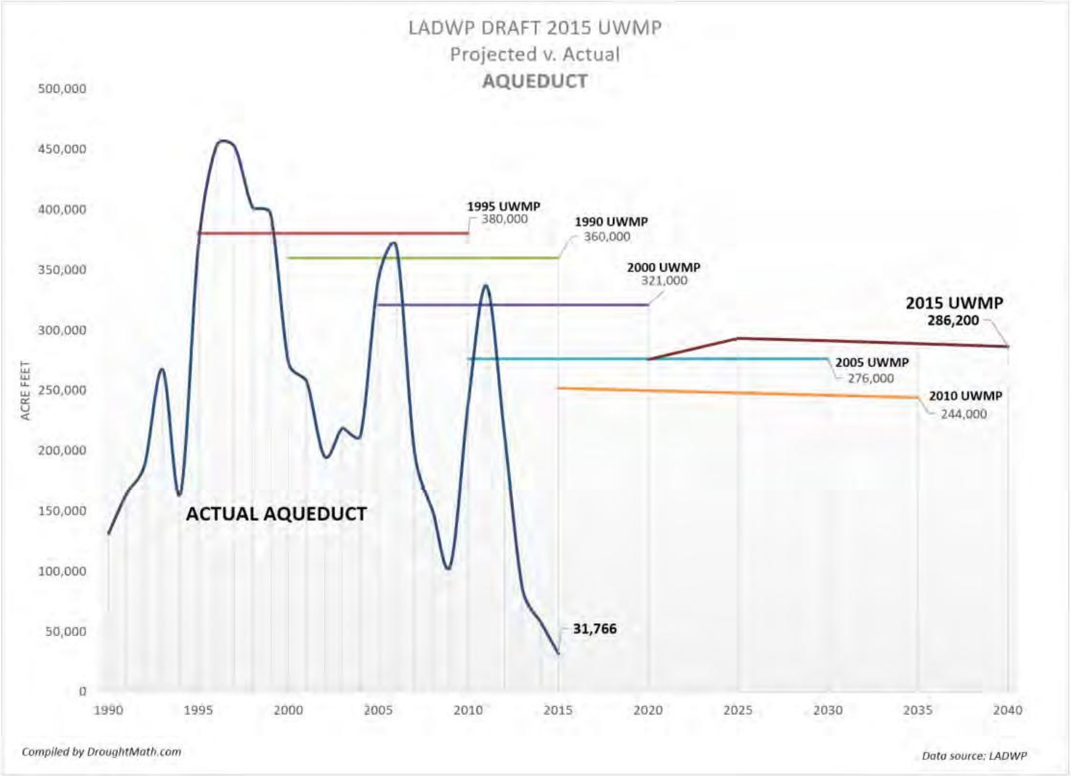


Figure 4- Los Angeles Aqueduct - The 2015 Draft UWMP continues to cite quantities of aqueduct water that is far over the average of 207,670 acre-feet since 2007.

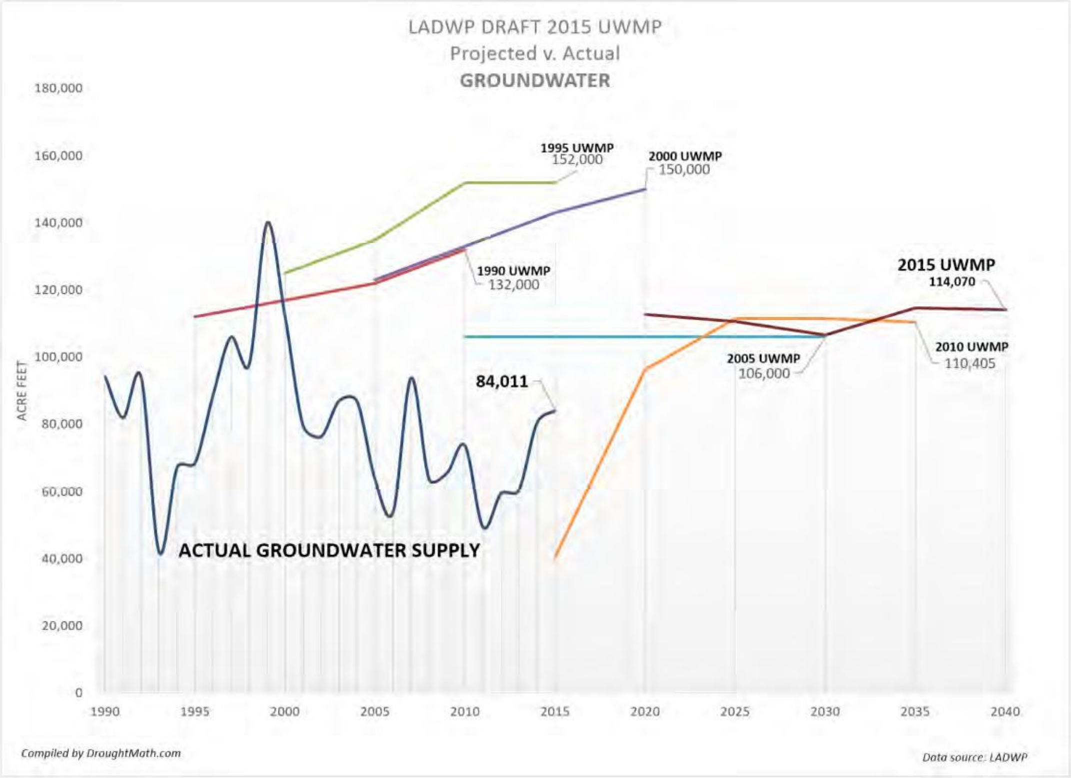
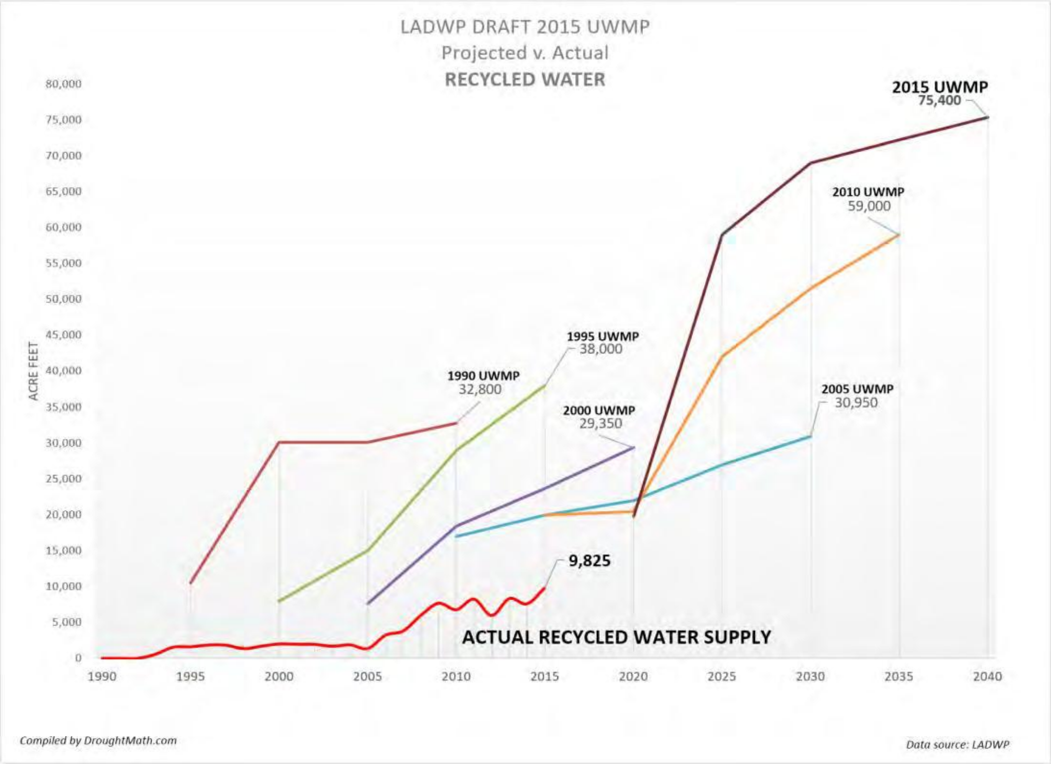


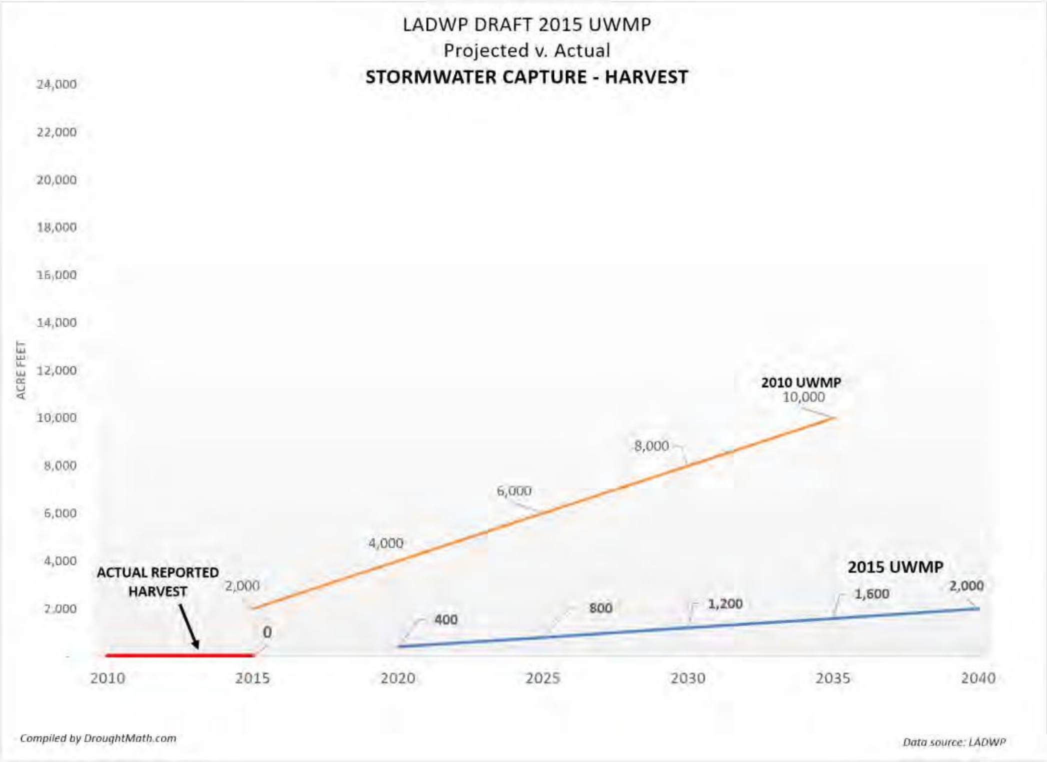
Figure 5 - Domestic Groundwater - For decades the LADWP has told planners that it will have over 100,000 acre-feet of groundwater which will be sufficient for future growth. It never came.


LADWP DRAFT 2015 UWMP
Projected v. Actual
RECYCLED WATER

Compiled by DroughtMath.com

Data source: LADWP

Figure 6 - Recycled Water - For decades EIR's have cited LADWP projections telling planners that there will be an abundant supply of recycled water ranging from 30,000 to 59,000 acre-feet. The department hasn't even met its 1990, 1995, 2000, or 2005 promises.


LADWP DRAFT 2015 UWMP
Projected v. Actual
STORMWATER CAPTURE - HARVEST

Compiled by DroughtMath.com

Data source: LADWP

Figure 7 - Harvest (Rain Barrels & Cisterns) - In the most recent UWMP's, the department had to invent new categories of water that can't be considered a supply because it never enters the departments water supply and it can't be measured.

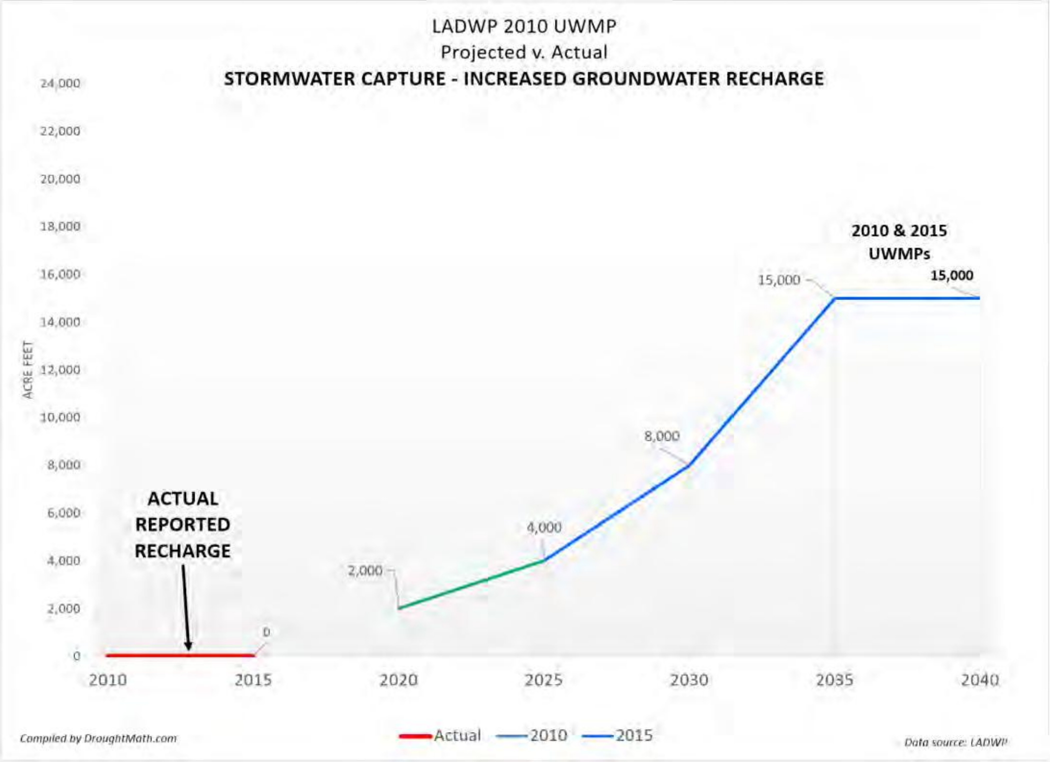


Figure 8 - Recharge (Indirect Potable Reuse) - Some of the LADWP's new categories of water may not result in increases of water. The efforts to recharge the basin are likely being made to stem further losses of groundwater.

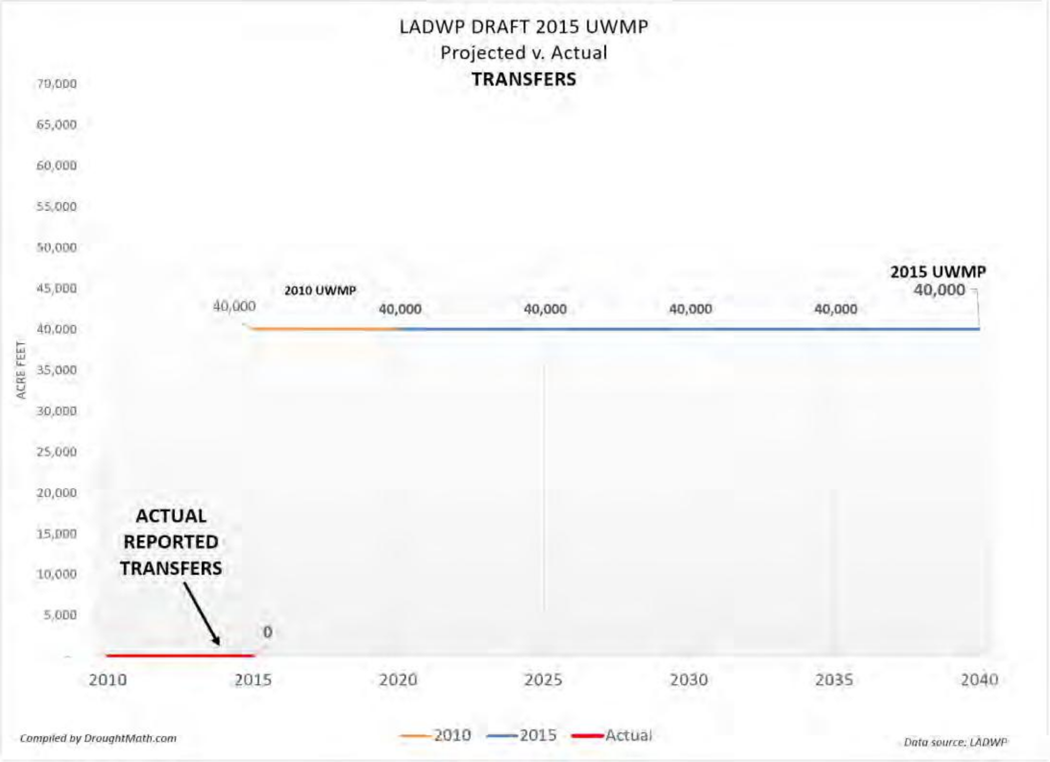


Figure 9 – Transfers - The LADWP told planners that 40,000 acre-feet of 'Transfer' water would be available for the supply projects they were evaluating starting in 2015. It never came.

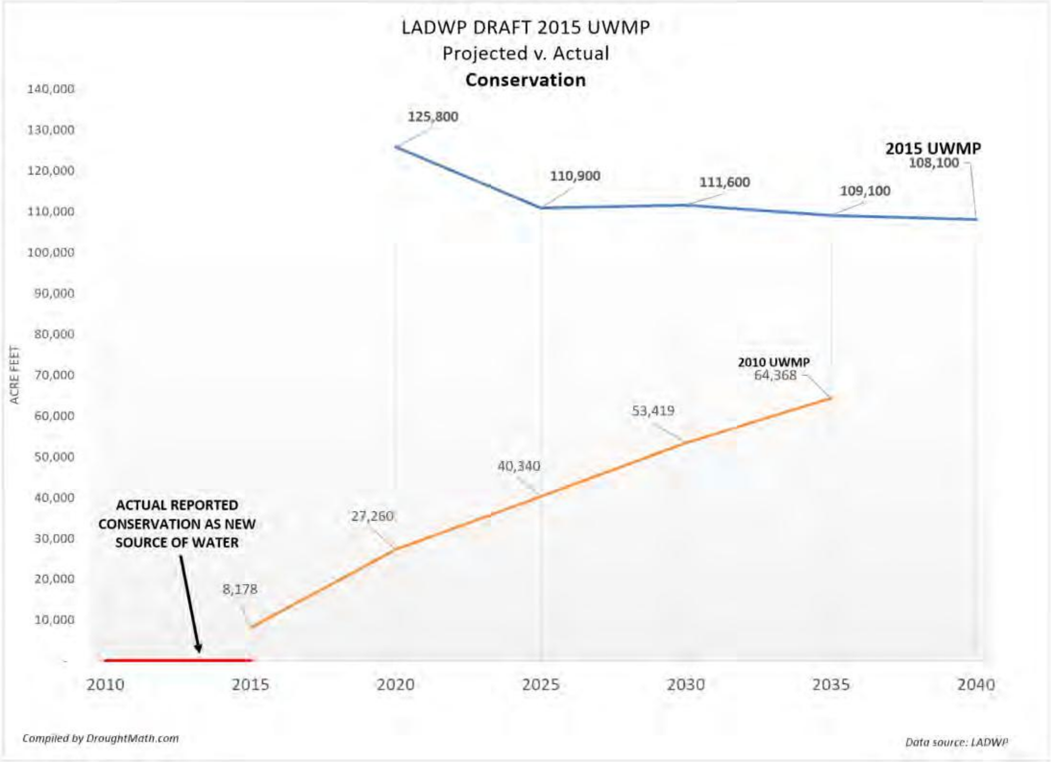


Figure 10 - Conservation – Project v. Actual Deliveries - The LADWP told planners that 8,178 acre-feet of water would be available by 2015 to the supply projects they were evaluating. It never came. The city has had to double-down on conservation just to get by.

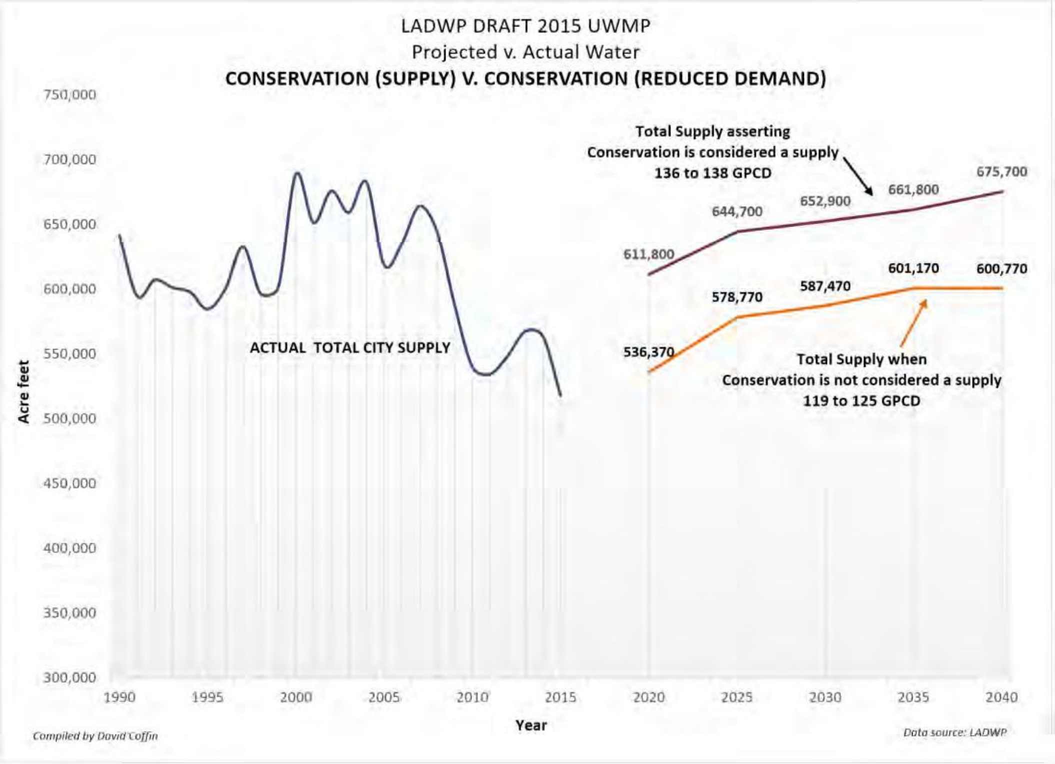


Figure 11 - Conservation – Lowered Baseline V. Paper Water - To preserve the appearance of sufficient future supplies without having to acknowledge that seriously difficult conservation efforts would be needed, the department calls conservation a supply. If the conservation targets are not met, the real result is a much smaller supply than the department is willing to admit to.

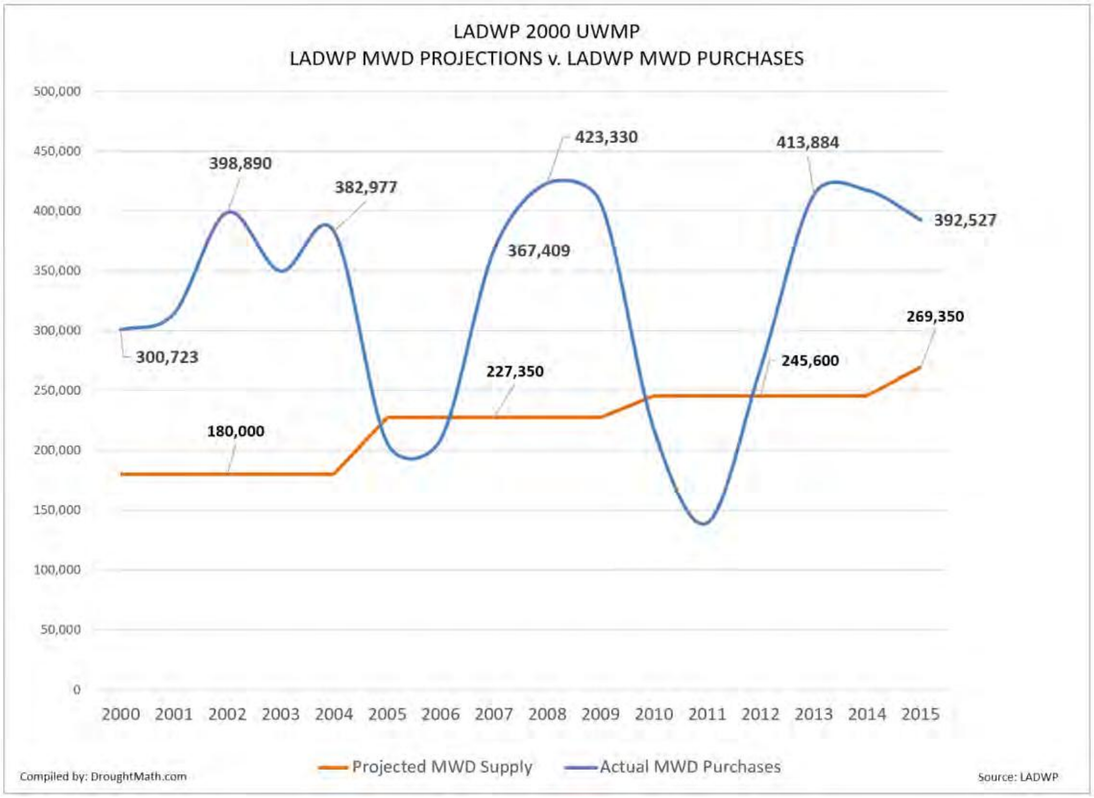


Figure 12 - Projected MWD Purchases v. Actual MWD Purchases - The LADWP consistently low-balls MWD projections. When the department fails to meet it stated goals, it has to purchase large amounts of MWD water. The 2015 UWMP takes this practice to new lows at just 60,630 acre-feet per year.

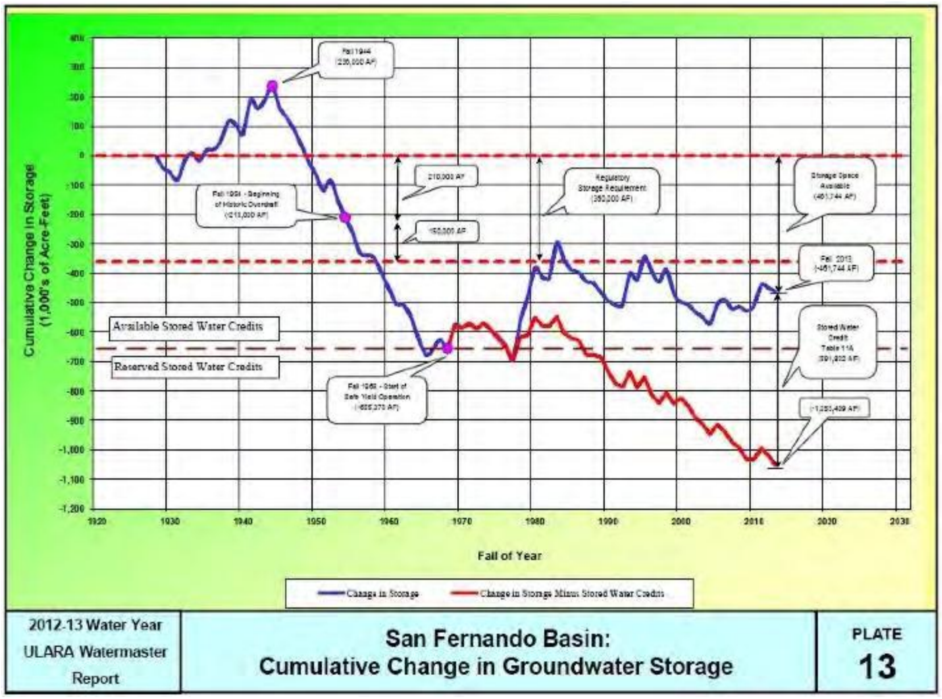


Figure 13 - Change in Groundwater Storage - The groundwater recharge category is less about attempting to find 'new water' and more about trying to stem the losses of old water in the San Fernando Basin.

Closing Comments

In closing, the 2015 Draft UWMP is totally inadequate in its current form. It mischaracterizes the city's true water supply outlook and it should be revised using meaningful, measurable, achievable water supply projections that planners, developers, and residents can be assured the department can meet.

The LADWP's continuing reliance on 'paper water' to foster the perception of a growing water supply in its UWMP's will only further exacerbate the city's water shortage as it grows, makes Environmental Impact Reviews associated with developments within the city vulnerable to legal challenges and could potentially threaten the city's viability if the practice continues.

David Coffin
Los Angeles, CA 90045
DroughtMath.com

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[i] This analysis focuses exclusively on the Average Year assessments to keep it simple.

[ii] Show Me the Water Plan, Hanak, 2010

[iii] Water for Growth, Hanak, 2009 - http://www.waterplan.water.ca.gov/cwpu2009/index.cfm Vol 4, Reference Guide, Pg. 75.

[iv] The years 2013, 2014, & 2015 were excluded as they may not be necessarily 'average' years but instead outliers given the recent drought.

[v] The LADWP's claims to have access Harvested Water has no suitable provision for measurement identified in 'Methodologies Urban Per Capita Water Use' http://www.water.ca.gov/wateruseefficiency/sb7/docs/methodologies-urban-per-capita-water-use-10042010.pdf

[vi] 2012-13 ULARA Water Year Annual Report. Pg 2-32, 2-33, Plate 13. http://ularawatermaster.com/public_resources/WY-2012-13-ULARA-WM-Rpt-12-2014.pdf

From: Melanie Winter
Sent: Wednesday, March 16, 2016 1:18 PM
To: Hsu, Chiun-Gwo (Simon)
Cc: Castro, Art; Villegas, Rafael
Subject: UWMP Comments

Good afternoon Simon -

Thank you for the opportunity to comment on the UWMP. I provided several substantive comments on technical issue and Plan assumptions (primarily related to choice of target, climate science, and reliance on MWD assurances) at the Public Meeting on March 9. Attendees were given to understand that those comments were recorded and provided to you. If this is incorrect, I would be happy to meet and reiterate my specific concerns. My comments below are focused on specifics in Chapters 3 & 7.

Page 7-21 - Woodman Ave. Case Study

The River Project was edited out of the project description. Please remedy. The project was identified by the PCNC during the development of the Tujunga-Pacoima Watershed Plan process, which The River Project led and authored. The River Project developed the project concept, co-authored the Prop 50 grant with DWP, was instrumental in securing that grant, led the community education and engagement process, provided expertise that helped remedy project design flaws which led to its collapse in the first rainstorm, and maintained the project vegetation for the first year. Please acknowledge the critical role this partner played in the project.

Delete “through pre-treatment devices” in the 3rd sentence of the 3rd paragraph. Stormwater flows from the street directly into the swale.

Delete “and rip-rap” in the 2nd sentence of the 4th paragraph. There is river rock in places, but not rip-rap.

Replace “groundwater” with stormwater, and delete “shallow in depth” from the second sentence of the 5th paragraph.

In "The Benefits" section introductory paragraph, the use of a parenthetical is awkward - as is the use of 'whom.' Consider revising.

In addition, the total AFY recharged is not mentioned anywhere on this page.

Bullet points should be edited. Currently, two key benefits are jammed together in each of the first two bullets, and the last two bullets are redundant.

Page 7-7

The River Project would appreciate acknowledgement as a SCMP partner/supporter in the (e.g.…) list.

Page 7-18 & Pages 3-24 through 3-17

Discussions of On-site Infiltration and On-site Direct Use, Residential Landscape Conservation, and the Watershed Approach neglect to reflect or acknowledge The River Project's substantial accomplishments, activities, and partnerships with LADWP on these issues. The Water LA Pilot has contributed significantly to advancements on these issues and the program is recognized in the SCMP and the Basin Conservation Study as a critical component of meeting local water goals. We would be happy to provide you with a language to describe relevant particulars for sections 7.3.1, 7.5.1.1, and 7.5.1.2 in order to assist in producing a more accurate and robust document.

Page 3-26

DWP's Watershed Management Group has partnered with organizations other than TreePeople on stormwater capture projects, and TreePeople are not the only non-profit partnering with multiple City (and County) departments and agencies. The River Project has been doing this work for over 16 years, partnering with DWP's Watershed Management Group and various agencies and departments in the development of the Tujunga Wash Feasibility Study in 2000, the Tujunga-Pacoima Watershed Plan in 2007, partnering on the Woodman Avenue Median in 2011, and developing the Water LA Pilot and Program in 2014, among others. Acknowledgement would be appropriate. We are more than happy to work with you on language.

Elmer Avenue is described as "demonstrating effective distributed stormwater BMPs on residential homes." While Elmer is a demonstration of an effective distributed Green Street, its value does not derive in any significant way from the residential BMPs. The Panorama City Water LA Pilot provides far greater benefits from residential home retrofits.

Appreciate your attention -

Melanie

--

Melanie Winter
Director, The River Project

Working toward a living Los Angeles River,
Nourished by a healthy watershed.
www.TheRiverProject.org
www.WaterLA.org

March 16, 2016

Commissioners,

The 2015 Urban Water Management Plan prepared by the DWP does not begin to address the reality the City of Los Angeles faces regarding its dwindling water resources. Rather than using factual information and realistic estimates to create a strategy for water use, the authors of the UWMP rely on wishful thinking with little in the way of factual data to support their assumptions.

In order to lay the groundwork for any discussion of the future of our water resources, it's important to start with a discussion of the impacts of climate change on snowpacks in the Western United States. Research by reputable institutions shows that these snowpacks have been declining for many years. In spite of the fact that heavy snows have restored snowpacks during the current season, there is no reason to expect the long-term trend toward decline to reverse itself in the foreseeable future. Here are links to studies done by the American Meteorological Society and the Earth Institute at Columbia University.

Declining Mountain Snowpack in Western North America
American Meteorological Society, January 2005
http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-86-1-39

The Earth Institute/Columbia University
Declining Snowpacks May Cut Many Nations' Water
http://www.earthinstitute.columbia.edu/articles/view/3265

While our elected officials continue to characterize what we are experiencing as a cyclical drought, this research seems to indicate a different conclusion, that we are seeing a long-term reduction of our water resources due to climate change. By tacitly accepting the assumption that we are merely experiencing a cyclical drought, the 2015 UWMP does not begin to address the severity of the situation.

The plan does talk about the fact that we'll be getting much less water from the LA Aqueduct than we have in the past. In 2014/2015 we received only 53,500 AFY. Less than 14% of what we were getting thirty years ago. This is a record low. It's also important to note that last year the LA Aqueduct was closed for the first time in its history. From April through September we received no water from the LAA.

It its discussion of supplies from the SWP & MWD, the 2015 UWMP relies on the State's projections that they will be able to provide a reliable supply through 2040. This is far from certain. The decline of the snowpacks in the Sierras, coupled with ongoing conflicts regarding State water policy, make future deliveries hard to predict. And with snowpacks in the Rockies also declining, the MWD can't count on consistent deliveries from the Colorado River.

The 2015 UWMP does not provide enough context to make its assumptions about future water deliveries credible. The document should not be approved in its current state. Here are some specific comments.

1. LA Aqueduct

In its explanation of how we're going to replace the water supply from the aqueduct, the UWMP refers to recycling and stormwater capture. Both are important resources that we need to take advantage of, but at this point they produce only a small fraction of the water used by the City. We've barely started to build the infrastructure necessary to exploit recycling and stormwater capture. Under the heading Recycled Water Planning Efforts, the document refers to recycling projects that are in the "planning, design, or construction stage." But while a number of future projects are mentioned, almost all are currently in the planning stage. There is no detailed explanation of how much increased supply we can expect from these recycling projects. There is no timetable for building the necessary infrastructure. The UWMP does not identify the sources of revenue that will finance this infrastructure. This is crucial, since rate hikes are currently being planned merely to repair and upgrade existing water infrastructure. If we haven't even been able to maintain the current system, how can we depend on vague promises about future projects?

2. Water Transfers

The UWMP includes this statement regarding water transfers:

LADWP plans on acquiring water through transfers of up to 40,000 AFY to replace a portion of the Los Angeles Aqueduct (LAA) water used for environmental enhancements in the eastern Sierra Nevada. The City would purchase water when available and economically beneficial for storage or delivery to LADWP's transmission and distribution system.

It seems the DWP is relying on transfers through the SWP/MWD system, but the entire state of California is experiencing water supply shortages. If snowpacks continue to decline, as current research indicates, the crisis will continue to worsen statewide. Even if it might be possible at times to secure 40,000 AF, the UWMP is supposed to be laying out a strategy for the next 25 years. The idea that we can rely on the SWP/MWD system to furnish us with 40,000 AF every year for the next 25 years is absurdly optimistic. Even if they had the spare capacity, the cost would likely be prohibitive.

3. Groundwater

Right now the supplies we get from aquifers within city limits provide between 10% and 15% of what we use annually. But in the Executive Summary under the heading Water Supply Reliability the DWP states:

The exhibits show that the City's locally-developed supplies will increase from 14 percent to 49 percent in dry years or to 47 percent in average years.

Again, this prediction is absurdly optimistic. The exhibits that supposedly support this contention are based on wishful thinking rather than sound, fact-based planning. There is no detailed outline of the steps that will be taken, or the funding that will be required to accomplish this.

The UWMP goes on to assert that:

> *These local supplies are not influenced by variability in hydrology, and will become the cornerstone of LA's future water supplies.*
>
> How could anyone at the DWP expect anyone to believe such a ridiculous statement? The groundwater resources that we have in Los Angeles are susceptible to hydrological variability in the same way that water resources all over the world are susceptible to hydrological variability. DWP staff obviously knows better. Sadly, the inclusion of this statement calls into question the Department's credibility when it comes to providing the people of Los Angeles with an accurate assessment of their water resources.
>
> There are other issues with the DWP's promises to supply nearly half of the City's demand with local water resources. Most of our groundwater comes from wells in the San Fernando Valley, and about half of those wells are closed right now because of industrial pollution. The DWP does have a plan to build two treatment plants that will purify the water from these sources, but it could be years before they break ground. At this point they don't even have the funding lined up.

The State has mandated that water agencies prepare UWMPs in order to insure that Californians can expect their resources to be managed in such a way that their needs will be met. The Draft 2015 UWMP as prepared by the DWP, for all the graphs and statistics it includes, is based on unrealistic assumptions and does not provide detailed strategies or timelines which demonstrate how the agency's goals will be achieved.

This document will play a crucial role in decision making for years to come. Because the current version does not provide an accurate, credible account of the state of our water resources, it can only undermine future planning efforts. <u>The DWP Board of Commissioners must not approve the 2015 UWMP in its current form.</u>

Sincerely,
Casey Maddren

TREEPEOPLE

Los Angeles Department of Water and Power
John Ferraro Building
111. N. Hope Street, Room 1460
Los Angeles, CA 90012
Attn: Simon Hsu

Submitted to: uwmp@ladwp.com

March 16, 2016

Re: Comments on Draft 2015 Urban Water Management Plan

Dear Mr. Hsu,

Thank you for the opportunity to submit comments on the Draft 2015 Urban Water Management Plan (UWMP). TreePeople commends LADWP on its commitment to decreasing the City's reliance on imported water by growing its local supplies and we would like to congratulate you for your efforts to create an extensive urban water management plan that takes into account climate change and multi-benefit projects. Overall, the UWMP is a step in the right direction and will help secure a water future that includes increased conservation, stormwater capture and other investments in local supplies. We encourage LADWP to continue moving along this path. Toward that end, we submit the following comments for consideration and urge you to incorporate them in the Draft UWMP before it is finalized, so that the document can represent as robust and progressive a path for the City as possible.

Chapter 3:
Cost effective conservation approaches, such as installation of water saving fixtures and customer behavior changes, are notable successes from LADWP and we look forward to further efforts to extend programs like these to institutional and commercial customers. Use of the watershed approach for water-efficient landscaping is vital to maintain watershed protection, ecosystem services, and incorporating the needs of residential landscaping. TreePeople has found that maintaining proper soil moisture is critical for successful turf retrofits, as soil moisture is the best way to regulate irrigation and avoid desertification of residential landscapes.

We, among other groups, have been working with DWP and the Mayor's Office on a "Watershed Approach" to be used for any new turf replacement rebates. We hope to see this finalized and institutionalized soon. TreePeople would like to emphasize that updated requirements for residential landscaping rebate programs align with our, and our partner organizations', recommendations and should include; 0% artificial turf allowed, only biodegradable weed barriers allowed, and additional existing NGOs be listed as resources so that educational programming is equitably distributed city-wide. For example, TreePeople offers sustainable landscaping classes, hands on workshops and can coordinate professional training on LADWP's behalf should there be interest.

Chapter 7:
We are pleased with LADWPs interest in stormwater capture and by the work of the watershed management group. We look forward to seeing more stormwater capture multi-benefit projects that improve biodiversity, augment local water supply, prevent downstream pollution, and reduce urban flooding.

As partners with LADWP on the Stormwater Capture Master Plan (SCMP) we recommend using the aggressive scenario values presented on page ES-18 or explaining why there is a range between the two scenarios. Please also consider including language about what conditions are needed for aggressive milestones to be pursued.

As partners in the Greater Los Angeles Water Collaborative, we note that the LA StormCatcher project is mentioned on page 7-18, however the tank size information is incorrect. The LA StormCatcher tank sizes actually range between 420 and 1,981 gallons each. We recommend the following description to add more clarity and context: "while the cistern capacities range between 420 and 1,981 gallons, there are multiple tanks per site, and each system therefore ranges between 840 and 3,962 gallons."

Chapter 9:
In an era of climate change which leads to many uncertainties around future water supplies, we are pleased to see LADWP pursue ongoing efforts to investigate alternative water supply options. We are also pleased to see emphasis both in this chapter and throughout the UWMP on the importance of developing more local supplies rather than continuing to rely on costly and increasingly unreliable imports.

While it historically has made sense for LADWP to develop water transfer solutions to offset Los Angeles Aqueduct supply reductions (for example, the Neenach Pumping Station), there is reason to be skeptical of investments in new hard infrastructure projects for water transfers for imported supplies. How will LADWP balance investments in both large ticket centralized infrastructure and in the development of new water transfer programs against urgent needs for investments in local supplies like stormwater capture, which can be less energy intensive, more reliable, and can lessen impacts on the environment? Please explain the balance in investments to both traditional and newer, less centralized, technologies.

Lastly, given the costs and environmental impacts of desalination, we are encouraged by LADWP's prioritization of resources for enhancing local supplies, recycling, and conservation efforts. We caution LADWP's potential future exploration of desalination because it will divert investments and upgrades in local water supply technologies which can provide the water needed in LA with fewer environmental impacts and costs.

Chapter 11:
The water contingency plan described in section 11.4 is very detailed, however it does not indicate how tree watering will be affected. As detailed in TreePeople's recent report, *Transferring Lessons from Australia's Millennium Drought to California,* Australia learned the importance of keeping mature trees alive—especially in times of drought—to protect the public

from extreme heat, as tree canopy and its associated evapotranspiration provide needed cooling.[1] Trees require water especially during dry years to maintain their overall health. The loss of mature trees due to infrequent or improper watering during times of drought must be avoided at all costs, as smaller replacement trees do not offer the same benefits as mature trees. Additionally, mature trees help manage stormwater, reduce energy costs to nearby buildings, and provide many other benefits. The loss of mature tree canopies will have profound environmental and public health implications for Angelenos, particularly those already more vulnerable to heat-related illnesses. Please include details on strategies for maintaining tree health in this report. TreePeople is available as a collaborative resource to help craft these guidelines.

Chapter 12:
We are very encouraged that LADWP is making concerted efforts to explore the many complexities surrounding the water and energy nexus. Understanding the full carbon footprint of the utility is not only necessary to meet mandates for reducing global warming, but socially and fiscally responsible given the impact of emissions on public health, the environment, and ratepayers' pocket books. The water and energy nexus provides an additional layer of justification for investments in low energy, distributed stormwater capture projects and we hope to see the utility make ambitious efforts to scale up these efforts to reduce energy consumption. Language such as "It is imperative that supply options are carefully vetted and evaluated against both adaptation and mitigation goals, as they may conflict and work against each other" (p. 12-28) reveals the type of evaluation that is critical for successful decision making in an era of climate change, and we would like to see LADWP take this thinking even further by elaborating on what types of frameworks will be used to ensure these evaluations are rigorous and effective.

We want to highlight what we consider to be highly problematic language found in this chapter around projected climate change impacts, specifically, statements such as "there is still general uncertainty within the scientific community regarding the potential impacts of climate change within the City of Los Angeles" (p. 12-1) and "predictions of changes in precipitation are even more speculative" (p. 12-2). While the science behind projecting long-term climate impacts is highly complex and inherently uncertain, highly sophisticated research conducted locally in our region has given us valuable information that provides more clarity than what we believe is implied in this document.[2] Furthermore, as much of the water used is Los Angeles is sourced from other parts of the state, climate change impacts experienced at water source origins will greatly affect water supply reliability in Los Angeles.

It is encouraging to see that local groundwater (in Section 12.2.4), as a low energy-intensive resource, will play an increasingly important role in LADWP's supplies. More information than what is provided on capabilities for scaling up groundwater as a water source and the associated

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[1] https://www.treepeople.org/sites/default/files/pdf/publications/TreePeople%20-%20Transferring%20Lessons.pdf

[2] Some resources for reference include: "Climate Change in the Los Angeles Region: Temperature results." Alex Hall, UCLA (http://research.atmos.ucla.edu/csrl//docs/Hall-LA_temp_study_fact_sheet-Dec2013.pdf); "Using Future Climate Projections to Support Water Resources Decision Making in California." California Climate Change Center (http://www.water.ca.gov/pubs/climate/using_future_climate_projections_to_support_water_resources_decision_making_in_california/usingfutureclimateprojtosuppwater_jun09_web.pdf); "Preparing for Climate Change Impacts in Los Angeles: Strategies and Solutions for Protecting Local Communities." Union of Concerned Scientists (http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/preparing-for-climate-change-impacts-in-los-angeles.pdf).

cost savings relative to other supply sources would only amplify the case for investments. Another area where more info on projected cost savings would be useful is treatment energy (in Section 12.2.6). With the release of new Los Angeles County Department of Public Health guidelines for indoor non-potable water use, there is potential for energy savings around water treatment, and we encourage LADWP to examine these opportunities closely.[3]

Thank you for considering these comments for incorporation into the Draft 2015 Urban Water Management Plan. If you have any questions or would like to discuss these comments, please do not hesitate to contact me at (818) 623-4887 or dbloome@treepeople.org.

Sincerely,

Deborah Weinstein Bloome

Deborah Weinstein Bloome
Senior Director of Policy

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[3] *Guidelines for Alternate Water Sources: Indoor and Outdoor Non-Potable Uses*. Los Angeles County Department of Public Health, February 2016.
http://www.smgov.net/uploadedFiles/Departments/OSE/Contact_Find_Us/Guidelines%20for%20Alternate%20Water%20Sources_2-10-16.pdf

Metro
Los Angeles County
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One Gateway Plaza
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metro.net

March 16, 2016

LA Department of Water and Power
111 N. Hope Street
Los Angeles 90012.

Subject: Draft Urban Water Management Plan – Comments

To whom it may concern:

On behalf of the Los Angeles County Metropolitan Transportation Authority (Metro) I would like to submit the below comments and/or questions on the Los Angeles Department of Water and Power's Draft Urban Water Management Plan (UWMP).

Chapter 6 Comments/Questions:

1. This Plan mentions the Groundwater System Improvement Study (completed in February 2015) and calls out "high priority" chemicals of concern. The plan imposes stricter limits than the state government on the allowable amounts of such "high priority" chemicals in drinking water but does not make recommendations of how users of these chemicals should handle or dispose of them, nor does it call out specific remediation measures. Will the final version of the UWMP address disposal or remediation measures for the stricter limits?

Chapter 7 Comments/Questions:

2. How does the LADWP track the potential stormwater harvesting capacity for implementation strategies, such as rain barrels and cisterns, which are largely privately owned? Does it make a difference if owners are not trained about the use?
3. Without a measurement instrument for these water conservation strategies, how conservative or liberal is the calculation of onsite stormwater storage?

Chapter 12 Comments/Questions:

4. Page 12-4 - What are the "*business-as-usual*" emission levels? Are these the levels for the County specifically or based on global projections?
5. Page 12-4, first paragraph last sentence – *"..the most likely warming increase was projected to be somewhat smaller*." What is the actual definition of this "smaller" warming increase?
6. Page 12-4, second paragraph last sentence – What does 42,900 AF look like in regards to households/year or some other measurable comparison?
7. Page 12-6, first paragraph – "*It was found that there is a wide range of overall efficiency and resiliency within the existing system and that certain facilities are*

more readily adaptable to future changes than others." Are there factors that make certain systems and facilities more readily adaptable? Is it a location-based outcome?

Sincerely,

Alvin Kusumoto

Alvin Kusumoto
Transportation Sustainability Energy Manager
Los Angeles County Metropolitan Transportation Authority

Urban Water Management Plan
Appendix E

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Urban Water
Management Plan

Appendix F

Groundwater Basin Adjudications

- San Fernando Basin – Judgment 650079
- Sylmar Basin – Judgment 650079
- Verdugo Basin – Judgment 650079
- Eagle Rock Basin – Judgment 650079
- Sylmar Stipulation – Judgment 650079
- West Coast Basin – Judgment 506806
- Central Basin – Judgment 786656

ULARA: Judgement 650079

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SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES,)
)
Plaintiff,) No. 650079
)
vs.) JUDGMENT
)
CITY OF SAN FERNANDO, et al.,)
)
Defendants.)
)

There follows by consecutive paging a Table of Contents (pages i. to vi.), Recitals (page 1), Definitions and List of Attachments (pages 1 to 6), Designation of Parties (page 6), Declaration re Geology and Hydrology (pages 6 to 12), Declaration of Rights (pages 12 to 21), Injunctions (pages 21 to 23), Continuing Jurisdiction (page 23), Watermaster (pages 23 to 29), Physical Solution (pages 29 to 34), and Miscellaneous Provisions (pages 34 to 35), and Attachments (pages 36 to 46). Each and all of said several parts constitute a single integrated Judgment herein.

1. RECITALS

This matter was originally tried before the Honorable Edmund M. Moor, without jury, commencing on March 1, 1966, and concluding with entry of Findings, Conclusions and Judgment on March 14, 1968, after more than 181 trial days. Los Angeles appealed from said judgment and the California Supreme Court, by unanimous opinion, (14 Cal. 3d 199) reversed and remanded the case; after trial of some remaining issues on remand, and consistent with the opinion of the Supreme Court, and pursuant to stipulations, the Court signed and filed Findings of Fact and Conclusions of Law. Good cause thereby appearing,

IT IS ORDERED, ADJUDGED AND DECREED:

2. DEFINITIONS AND ATTACHMENTS

2.1 Definitions of Terms. As used in this Judgment, the following terms shall have the meanings herein set forth:

[1] Basin or Ground Water Basin -- A subsurface geologic formation with defined boundary conditions, containing a ground water reservoir, which is capable of yielding a significant quantity of ground water.

[2] Burbank -- Defendant City of Burbank.

[3] Crescenta Valley -- Defendant Crescenta Valley County Water District.

[4] Colorado Aqueduct -- The aqueduct facilities and system owned and operated by MWD for the importation of water from the Colorado River to its service area.

[5] Deep Rock -- Defendant Evelyn M. Pendleton, dba Deep Rock Artesian Water Company.

[6] Delivered Water -- Water utilized in a water supply distribution system, including reclaimed water.

[7] Eagle Rock Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[8] Extract or Extraction -- To produce ground water, or its production, by pumping or any other means.

[9] Fiscal Year -- July 1 through June 30 of the following calendar year.

[10] Foremost -- Defendant Foremost Foods Company, successor to defendant Sparkletts Drinking Water Corp.

[11] Forest Lawn -- Collectively, defendants Forest Lawn Cemetery Association, Forest Lawn Company, Forest Lawn Memorial-Park Association, and American Security and Fidelity Corporation.

[12] Gage F-57 -- The surface stream gaging station operated by Los Angeles County Flood Control District and situated in Los Angeles Narrows immediately upstream from the intersection of the Los Angeles River and Arroyo Seco, at which point the surface outflow from ULARA is measured.

[13] Glendale -- Defendant City of Glendale.

[14] Ground Water -- Water beneath the surface of the ground and within the zone of saturation.

[15] Hersch & Plumb -- Defendants David and Eleanor A. Hersch and Gerald B. and Lucille Plumb, successors to Wellesley and Duckworth defendants.

[16] Import Return Water -- Ground water derived from percolation attributable to delivered imported water.

[17] Imported Water -- Water used within ULARA, which

is derived from sources outside said watershed. Said term does not include inter-basin transfers wholly within ULARA.

[18] In Lieu Storage -- The act of accumulating ground water in a basin by intentional reduction of extractions of ground water which a party has a right to extract.

[19] Lockheed -- Defendant Lockheed Aircraft Corporation.

[20] Los Angeles -- Plaintiff City of Los Angeles, acting by and through its Department of Water and Power.

[21] Los Angeles Narrows -- The physiographic area northerly of Gage F-57 bounded on the east by the San Rafael and Repetto Hills and on the west by the Elysian Hills, through which all natural outflow of the San Fernando Basin and the Los Angeles River flow en route to the Pacific Ocean.

[22] MWD -- The Metropolitan Water District of Southern California, a public agency of the State of California.

[23] Native Safe Yield -- That portion of the safe yield of a basin derived from native waters.

[24] Native Waters -- Surface and ground waters derived from precipitation within ULARA.

[25] Overdraft -- A condition which exists when the total annual extractions of ground water from a basin exceed its safe yield, and when any temporary surplus has been removed.

[26] Owens-Mono Aqueduct -- The aqueduct facilities owned and operated by Los Angeles for importation to ULARA water from the Owens River and Mono Basin watersheds easterly of the Sierra-Nevada in Central California.

[27] Private Defendants -- Collectively, all of those

defendants who are parties, other than Glendale, Burbank, San Fernando and Crescenta Valley.

[28] Reclaimed Water -- Water which, as a result of processing of waste water, is made suitable for and used for a controlled beneficial use.

[29] Regulatory Storage Capacity -- The volume of storage capacity of San Fernando Basin which is required to regulate the safe yield of the basin, without significant loss, during any long-term base period of water supply.

[30] Rising Water -- The effluent from a ground water basin which appears as surface flow.

[31] Rising Water Outflow -- The quantity of rising water which occurs within a ground water basin and does not rejoin the ground water body or is not captured prior to flowing past a point of discharge from the basin.

[32] Safe Yield -- The maximum quantity of water which can be extracted annually from a ground water basin under a given set of cultural conditions and extraction patterns, based on the long-term supply, without causing a continuing reduction of water in storage.

[33] San Fernando -- Defendant City of San Fernando.

[34] San Fernando Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[35] Sportsman's Lodge -- Defendant Sportsman's Lodge Banquet Association.

[36] Stored Water -- Ground water in a basin consisting of either (1) imported or reclaimed water which is intentionally spread, or (2) safe yield water which is allowed to

accumulate by In Lieu Storage. Said ground waters are distinguished and separately accounted for in a ground water basin, notwithstanding that the same may be physically commingled with other waters in the basin.

[37] Sylmar Basin -- The separate ground water basin underlying the area indicated as such on Attachment "A".

[38] Temporary Surplus -- The amount of ground water which would be required to be removed from a basin in order to avoid waste under safe yield operation.

[39] Toluca Lake -- Defendant Toluca Lake Property Owners Association.

[40] ULARA or Upper Los Angeles River Area -- The Upper Los Angeles River watershed, being the surface drainage area of the Los Angeles River tributary to Gage F-57.

[41] Underlying Pueblo Waters -- Native ground waters in the San Fernando Basin which underlie safe yield and stored waters.

[42] Valhalla -- Collectively, Valhalla Properties, Valhalla Memorial Park, Valhalla Mausoleum Park.

[43] Van de Kamp -- Defendant Van de Kamp's Holland Dutch Bakers, Inc.

[44] Verdugo Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[45] Water Year -- October 1 through September 30 of the following calendar year.

Geographic Names, not herein specifically defined, are used to refer to the places and locations thereof as shown on Attachment "A".

2.2 List of Attachments. There are attached hereto the following documents, which are by this reference incorporated in this Judgment and specifically referred to in the text hereof:

"A" -- Map entitled "Upper Los Angeles River Area", showing Separate Basins therein.

"B" -- List of "Dismissed Parties."

"C" -- List of "Defaulted Parties."

"D" -- List of "Disclaiming Parties."

"E" -- List of "Prior Stipulated Judgments."

"F" -- List of "Stipulated Non-Consumptive or Minimal-Consumptive Use Practices."

"G" -- Map entitled "Place of Use and Service Area of Private Defendants."

"H" -- Map entitled "Public Agency Water Service Areas."

3. PARTIES

3.1 Defaulting and Disclaiming Defendants. Each of the defendants listed on Attachment "C" and Attachment "D" is without any right, title or interest in, or to any claim to extract ground water from ULARA or any of the separate ground water basins therein.

3.2 No Rights Other Than as Herein Declared. No party to this action has any rights in or to the waters of ULARA except to the extent declared herein.

4. DECLARATION RE GEOLOGY AND HYDROLOGY

4.1 Geology.

4.1.1 ULARA. ULARA (or Upper Los Angeles River Area), is the watershed or surface drainage area tributary to the Los Angeles River at Gage F-57. Said watershed contains a total of 329,000 acres, consisting of approximately 123,000 acres of valley fill area and 206,000 acres of hill and mountain area, located primarily in the County of Los Angeles, with a small portion in the County of Ventura. Its boundaries are shown on Attachment "A". The San Gabriel Mountains form the northerly portion of the watershed, and from them two major washes--the Pacoima and the Tujunga--discharge southerly Tujunga Wash traverses the valley fill in a southerly direction and joins the Los Angeles River, which follows an easterly course along the base of the Santa Monica Mountains before it turns south through the Los Angeles Narrows. The waters of Pacoima Wash as and when they flow out of Sylmar Basin are tributary to San Fernando Basin. Lesser tributary washes run from the Simi Hills and the Santa Susana Mountains in the westerly portion of the watershed. Other minor washes, including Verdugo Wash, drain the easterly portion of the watershed which consists of the Verdugo Mountains, the Elysian, San Rafael and Repetto Hills. Each of said washes is a non-perennial stream whose flood flows and rising waters are naturally tributary to the Los Angeles River. The Los Angeles River within ULARA and most of said tributary natural washes have been replaced, and in some instances relocated, by concrete-lined flood control channels. There are 85.3 miles of such channels within ULARA, 62% of which have lined concrete bottoms.

4.1.2 <u>San Fernando Basin</u>. San Fernando Basin is the major ground water basin in ULARA. It underlies 112,047 acres and is located in the area shown as such on Attachment "A".

Boundary conditions of the San Fernando Basin consist on the east and northeast of alluvial contacts with non-waterbearing series along the San Rafael Hills and Verdugo Mountains and the Santa Susana Mountains and Simi Hills on the northwest and west and the Santa Monica Mountains on the south. Water-bearing material in said basin extends to at least 1000 feet below the surface. Rising water outflow from the San Fernando Basin passes its downstream and southerly boundary in the vicinity of Gage F-57, which is located in Los Angeles Narrows about 300 feet upstream from the Figueroa Street (Dayton Street) Bridge. The San Fernando Basin is separated from the Sylmar Basin on the north by the eroded south limb of the Little Tujunga Syncline which causes a break in the ground water surface of about 40 to 50 feet.

4.1.3 Sylmar Basin. Sylmar Basin underlies 5,565 acres and is located in the area shown as such on Attachment "A". Water-bearing material in said basin extends to depths in excess of 12,000 feet below the surface. Boundary conditions of Sylmar Basin consist of the San Gabriel Mountains on the north, a topographic divide in the valley fill between the Mission Hills and San Gabriel Mountains on the west, the Mission Hills on the southwest, Upper Lopez Canyon Saugus Formation on the east, along the east bank of Pacoima Wash, and the eroded south limb of the Little Tujunga Syncline on the south.

4.1.4 Verdugo Basin. Verdugo Basin underlies 4,400 acres and is located in the area shown as such on Attachment "A". Boundary conditions of Verdugo Basin consist of the San Gabriel Mountains on the north, the Verdugo Mountains on the south and southwest, the San Rafael Hills on the southeast and the topographic divide on the east between the drainage area that is tributary to the Tujunga Wash to the west and Verdugo Wash to the east, the ground water divide on the west between Monk Hill-Raymond Basin and the Verdugo Basin on the east and a submerged dam constructed at the mouth of Verdugo Canyon on the south.

4.1.5 Eagle Rock Basin. Eagle Rock Basin underlies 807 acres and is located in the area shown as such on Attachment "A". Boundary conditions of Eagle Rock Basin consist of the San Rafael Hills on the north and west and the Repetto Hills on the east and south with a small alluvial area to the southeast consisting of a topographic divide.

4.2 Hydrology.

4.2.1 Water Supply. The water supply of ULARA consists of native waters, derived from precipitation on the valley floor and runoff from the hill and mountain areas, and of imported water from outside the watershed. The major source of imported water has been from the Owens-Mono Aqueduct, but additional supplies have been and are now being imported through MWD from its Colorado Aqueduct and the State Aqueduct.

4.2.2 Ground Water Movement. The major water-bearing formation in ULARA is the valley fill material bounded by hills and mountains which surround it. Topographically, the valley-fill area has a generally uniform grade in a southerly and easterly direction with the slope gradually decreasing from the base of the hills and mountains to the surface drainage outlet at Gage F-57. The valley fill material is a heterogeneous mixture of clays, silts, sand and gravel laid down as alluvium. The valley fill is of greatest permeability along and easterly of Pacoima and Tujunga Washes and generally throughout the eastern portion of the valley fill area, except in the vicinity of Glendale where it is of lesser permeability. Ground water occurs mainly within the valley fill, with only negligible amounts occurring in hill and mountain areas. There is no significant ground water movement from the hill and mountain formations into the valley fill. Available geologic data do not indicate that there are any sources of native ground water other than those derived from precipitation. Ground water movement in the valley fill generally follows the surface topography and drainage except where geologic or man-made impediments occur or where the natural flow has been modified by extensive pumping.

4.2.3 Separate Ground Water Basins. The physical and geologic characteristics of each of the ground water basins, Eagle Rock, Sylmar, Verdugo and San Fernando, cause impediments to inter-basin ground water flow whereby there is created separate underground reservoirs. Each of said basins contains a common source of water supply to parties extracting ground water from each of said basins. The amount of underflow from Sylmar Basin, Verdugo Basin and Eagle Rock Basin to San Fernando Basin is relatively small, and on the average has been approximately 540 acre feet per year from the Sylmar Basin; 80 acre feet per year from Verdugo Basin; and 50 acre feet per year from Eagle Rock Basin. Each has physiographic, geologic and hydrologic differences, one from the other, and each meets the hydrologic definition of "basin." The extractions of water in the respective basins affect the other water users within that basin but do not significantly or materially affect the ground water levels in any of the other basins. The underground reservoirs of Eagle Rock, Verdugo and Sylmar Basins are independent of one another and of the San Fernando Basin.

4.2.4 Safe Yield and Native Safe Yield. The safe yield and native safe yield, stated in acre feet, of the three largest basins for the year 1964-65 was as follows:

Basin	Safe Yield	Native Safe Yield
San Fernando	90,680	43,660
Sylmar	6,210	3,850
Verdugo	7,150	3,590

The safe yield of Eagle Rock Basin is derived from imported water delivered by Los Angeles. There is no measurable native safe yield.

4.2.5 Separate Basins -- Separate Rights. The rights of the parties to extract ground water within ULARA are separate and distinct as within each of the several ground water basins within said watershed.

4.2.6 Hydrologic Condition of Basins. The several basins within ULARA are in varying hydrologic conditions, which result in different legal consequences.

4.2.6.1 San Fernando Basin. The first full year of overdraft in San Fernando Basin was 1954-55. It remained in overdraft continuously until 1968, when an injunction herein became effective. Thereafter, the basin was placed on safe yield operation. There is no surplus ground water available for appropriation or overlying use from San Fernando Basin.

4.2.6.2 Sylmar Basin. Sylmar Basin is not in overdraft. There remains safe yield over and above the present reasonable beneficial overlying uses, from which safe yield the appropriative rights of Los Angeles and San Fernando may be and have been exercised.

4.2.6.3 Verdugo Basin. Verdugo Basin was in overdraft for more than five consecutive years prior to 1968. Said basin is not currently in overdraft, due to decreased extractions by Glendale and Crescenta Valley on account of poor water quality. However, the combined appropriative and prescriptive rights of Glendale and Crescenta Valley are equivalent to the safe yield of the Basin. No private overlying or appropriative rights exist in Verdugo Basin.

4.2.6.4 Eagle Rock Basin. The only measurable water supply to Eagle Rock Basin is import return water by reason of importations by Los Angeles. Extractions by Foremost and Deep Rock under the prior stipulated judgments have utilized the safe yield of Eagle Rock Basin, and have maintained hydrologic equilibrium therein.

5. DECLARATION OF RIGHTS

5.1 Right to Native Waters.

5.1.1 Los Angeles River and San Fernando Basin.

5.1.1.1 <u>Los Angeles' Pueblo Right</u>. Los Angeles, as the successor to all rights, claims and powers of the Spanish Pueblo de Los Angeles in regard to water rights, is the owner of a prior and paramount pueblo right to the surface waters of the Los Angeles River and the native ground waters of San Fernando Basin to meet its reasonable beneficial needs and for its inhabitants.

5.1.1.2 <u>Extent of Pueblo Right</u>. Pursuant to said pueblo right, Los Angeles is entitled to satisfy its needs and those of its inhabitants within its boundaries as from time to time modified. Water which is in fact used for pueblo right purposes is and shall be deemed needed for such purposes.

5.1.1.3 <u>Pueblo Right -- Nature and Priority of Exercise</u>. The pueblo right of Los Angeles is a prior and paramount right to all of the surface waters of the Los Angeles River, and native ground water in San Fernando Basin, to the extent of the reasonable needs and uses of Los Angeles and its inhabitants throughout the corporate area of Los Angeles, as its boundaries may exist from time to time. To the extent that the Basin contains native waters and imported waters, it is presumed that the first water extracted by Los Angeles in any water year is pursuant to its pueblo right, up to the amount of the native safe yield. The next extractions by Los Angeles in any year are deemed to be from import return water, followed by stored water, to the full extent of Los Angeles' right to such import return water and stored water. In the event of need to meet water requirements of its inhabitants, Los Angeles has the additional right, pursuant to its pueblo right, withdraw temporarily from storage Underlying Pueblo Waters, subject to an obligation to replace such water as soon as practical.

5.1.1.4 Rights of Other Parties. No other party to this action has any right in or to the surface waters of the Los Angeles River or the native safe yield of the San Fernando Basin.

5.1.2 Sylmar Basin Rights.

5.1.2.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground waters in Sylmar Basin.

5.1.2.2 Overlying Rights. Defendants Moordigian and Hersch & Plumb own lands overlying Sylmar Basin and have a prior correlative right to extract native waters from said Basin for reasonable beneficial uses on their said overlying lands. Said right is appurtenant to said overlying lands and water extracted pursuant thereto may not be exported from said lands nor can said right be transferred or assigned separate and apart from said overlying lands.

5.1.2.3 Appropriative Rights of San Fernando and Los Angeles. San Fernando and Los Angeles own appropriative rights, of equal priority, to extract and put to reasonable beneficial use for the needs of said cities and their inhabitants, native waters of the Sylmar Basin in excess of the exercised reasonable beneficial needs of overlying users. Said appropriative rights are:

San Fernando	3,580 acre feet
Los Angeles	1,560 acre feet.

5.1.2.4 No Prescription. The Sylmar Basin is not presently in a state of overdraft and no rights by prescription exist in said Basin against any overlying or appropriative water user.

5.1.2.5 Other Parties. No other party to this action owns or possesses any right to extract native ground waters from the Sylmar Basin.

5.1.3 Verdugo Basin Rights.

5.1.3.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground water in Verdugo Basin.

5.1.3.2 Prescriptive Rights of Glendale and Crescenta Valley. Glendale and Crescenta Valley own prescriptive rights as against each other and against all private overlying or appropriative parties in the Verdugo Basin to extract, with equal priority, the following quantities of water from the combined safe yield of native and imported waters in Verdugo Basin:

Glendale	3,856 acre feet
Crescenta Valley	3,294 acre feet.

5.1.3.3 Other Parties. No other party to this action owns or possesses any right to extract native ground waters from the Verdugo Basin.

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5.1.4 Eagle Rock Basin Rights.

5.1.4.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground water in Eagle Rock Basin.

5.1.4.2 No Rights in Native Waters. The Eagle Rock Basin has no significant or measurable native safe yield and no parties have or assert any right or claim to native waters in said Basin.

5.2 Rights to Imported Waters.

5.2.1 San Fernando Basin Rights.

5.2.1.1 Rights to Recapture Import Return Water. Los Angeles, Glendale, Burbank and San Fernando have each caused imported waters to be brought into ULARA and to be delivered to lands overlying the San Fernando Basin, with the result that percolation and return flow of such delivered water has caused imported waters to become a part of the safe yield of San Fernando Basin. Each of said parties has a right to extract from San Fernando Basin that portion of the safe yield of the Basin attributable to such import return waters.

5.2.1.2 Rights to Store and Recapture Stored Water. Los Angeles has heretofore spread imported water directly in San Fernando Basin. Los Angeles, Glendale, Burbank and San Fernando each have rights to store water in San Fernando Basin by direct spreading or in lieu practices. To the extent of any future spreading or in lieu storage of import water or reclaimed water by Los Angeles, Glendale, Burbank or San Fernando, the party causing said water to be so stored shall have a right to extract an equivalent amount of ground water from San Fernando Basin. The right to extract waters attributable to such storage practices is an undivided right to a quantity of water in San Fernando Basin equal to the amount of such Stored Water to the credit of any party, as reflected in Watermaster records.

5.2.1.3 <u>Calculation of Import Return Water and Stored Water Credits</u>. The extraction rights of Los Angeles, Glendale, Burbank and San Fernando in San Fernando Basin in any year, insofar as such rights are based upon import return water, shall only extend to the amount of any accumulated import return water credit of such party by reason of imported water delivered after September 30, 1977. The annual credit for such import return water shall be calculated by Watermaster based upon the amount of delivered water during the preceding water year, as follows:

Los Angeles:	20.8% of all delivered water (including reclaimed water) to valley fill lands of San Fernando Basin.
San Fernando:	26.3% of all imported and reclaimed water delivered to valley-fill lands of San Fernando Basin.
Burbank:	20.0% of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas.

Glendale: 20.0% of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas (i.e., total delivered water, [including reclaimed water], less 105% of total sales by Glendale in Verdugo Basin and its tributary hills).

In calculating Stored Water credit, by reason of direct spreading of imported or reclaimed water, Watermaster shall assume that 100% of such spread water reached the ground water in the year spread.

5.2.1.4 Cummulative Import Return Water Credits. Any import return water which is not extracted in a given water year shall be carried over, separately accounted for, and maintained as a cummulative credit for purposes of future extractions.

5.2.1.5 Overextractions. In addition to extractions of stored water, Glendale, Burbank or San Fernando may, in any water year, extract from San Fernando Basin an amount not exceeding 10% of such party's last annual credit for import return water, subject, however, to an obligation to replace such overextraction by reduced extractions during the next succeeding water year. Any such overextraction which is not so replaced shall constitute physical solution water, which shall be deemed to have been extracted in said subsequent water year.

5.2.1.6 Private Defendant. No private defendant is entitled to extract water from the San Fernando Basin on account of the importation of water thereto by overlying public entities.

5.2.2 Sylmar Basin Rights.

5.2.2.1 Rights to Recapture Import Return Waters. Los Angeles and San Fernando have caused imported waters to be brought into ULARA and delivered to lands overlying the Sylmar Basin with the result that percolation and return flow of such delivered water has caused imported waters to become a part of the safe yield of Sylmar Basin. Los Angeles and San Fernando are entitled to recover from Sylmar Basin such imported return waters. In calculating the annual entitlement to recapture such import return water, Los Angeles and San Fernando shall be entitled to 35.7% of the preceding water year's imported water delivered by such party to lands overlying Sylmar Basin. Thus, by way of example, in 1976-77, Los Angeles was entitled to extract 2370 acre feet of ground water from Sylmar Basin, based on delivery to lands overlying said Basin of 6640 acre feet during 1975-76. The quantity of San Fernando's imported water to, and the return flow therefrom, in the Sylmar Basin in the past has been of such minimal quantities that it has not been calculated.

5.2.2.2 Rights to Store and Recapture Stored Water. Los Angeles and San Fernando each have the right to store water in Sylmar Basin equivalent to their rights in San Fernando Basin under paragraph 5.2.1.2 hereof.

5.2.2.3 Carry Over. Said right to recapture stored water, import return water and other safe yield waters to which a party is entitled, if not exercised in a given year, can be carried over for not to exceed five years, if the underflow through Sylmar Notch does not exceed 400 acre feet per year.

5.2.2.4 Private Defendants. No private defendant is entitled to extract water from within the Sylmar Basin on account of the importation of water thereto by overlying public entities.

5.2.3 Verdugo Basin Rights.

5.2.3.1 Glendale and Crescenta Valley. Glendale and Crescenta Valley own appropriative and prescriptive rights in and to the total safe yield of Verdugo Basin, without regard as to the portions thereof derived from native water and from delivered imported waters, notwithstanding that both of said parties have caused waters to be imported and delivered on lands overlying Verdugo Basin. Said aggregate rights are as declared in Paragraph 5.1.3.2 of these Conclusions.

5.2.3.2 Los Angeles. Los Angeles may have a right to recapture its import return waters by reason of delivered import water in the Basin, based upon imports during and after water year 1977-78, upon application to Watermaster not later than the year following such import and on subsequent order after hearing by the Court.

5.2.3.3 Private Defendants. No private defendant, as such, is entitled to extract water from within the Verdugo Basin on account of the importation of water thereto by overlying public entities.

5.2.4 Eagle Rock Basin Rights.

5.2.4.1 Los Angeles. Los Angeles has caused imported water to be delivered for use on lands overlying Eagle Rock Basin and return flow from said delivered imported water constitutes the entire safe yield of Eagle Rock Basin. Los Angeles has the right to extract or cause to be extracted the entire safe yield of Eagle Rock Basin.

5.2.4.2 Private Defendants. No private defendants have a right to extract water from within Eagle Rock Basin, except pursuant to the physical solution herein.

6. INJUNCTIONS

Each of the parties named or referred to in this Part 6, its officers, agents, employees and officials is, and they are, hereby ENJOINED and RESTRAINED from doing or causing to be done any of the acts herein specified:

6.1 Each and Every Defendant -- from diverting the surface waters of the Los Angeles River or extracting the native waters of SAN FERNANDO BASIN, or in any manner interfering with the prior and paramount pueblo right of Los Angeles in and to such waters, except pursuant to the physical solution herein decreed.

6.2 Each and Every Private Defendant -- from extracting ground water from the SAN FERNANDO, VERDUGO, or EAGLE ROCK BASINS, except pursuant to physical solution provisions hereof.

6.3 Defaulting and Disclaiming Parties (listed in Attachments "C" and "D") -- from diverting or extracting water within ULARA, except pursuant to the physical solution herein decreed.

6.4 Glendale -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution; and from extracting water from VERDUGO BASIN in excess of its appropriative and prescriptive right declared herein.

6.5 Burbank -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution decreed herein.

6.6 San Fernando -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution herein decreed.

6.7 Crescenta Valley -- from extracting ground water from VERDUGO BASIN in any year in excess of its appropriative and prescriptive right declared herein.

6.8 Los Angeles -- from extracting ground water from SAN FERNANDO BASIN in any year in excess of the native safe yield, plus any import return water credit and stored water credit of said city; provided, that where the needs of Los Angeles require the extraction of Underlying Pueblo Waters, Los Angeles may extract such water subject to an obligation to replace such excess as soon as practical; and from extracting ground water from VERDUGO BASIN in excess of any credit for import return water which Los Angeles may acquire by reason of delivery of imported water for use overlying said basin, as hereinafter confirmed on application to Watermaster and by subsequent order of the Court.

6.9 Non-consumptive and Minimal Consumptive Use Parties. The parties listed in Attachment "F" are enjoined from extracting water from San Fernando Basin, except in accordance with practices specified in Attachment "F", or pursuant to the physical solution herein decreed.

7. CONTINUING JURISDICTION

7.1 Jurisdiction Reserved. Full jurisdiction, power and authority are retained by and reserved to the Court for purposes of enabling the Court upon application of any party or of the Watermaster by motion and upon at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate, for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment or to add to the provisions thereof consistent with the rights herein decreed; provided, however, that no such modification, amendment or amplification shall result in a change in the provisions of Section 5.2.1.3 or 9.2.1 hereof.

8. WATERMASTER

8.1 Designation and Appointment.

8.1.1 Watermaster Qualification and Appointment. A qualified hydrologist, acceptable to all active public agency parties hereto, will be appointed by subsequent order of the Court to assist the Court in its administration and enforcement of the provisions of this Judgment and any subsequent orders of the Court entered pursuant to the Court's continuing jurisdiction. Such Watermaster shall serve at the pleasure of the Court, but may be removed or replaced on motion of any party after hearing and showing of good cause.

8.2 Powers and Duties.

8.2.1 Scope. Subject to the continuing supervision and control of the Court, Watermaster shall exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

8.2.2 Requirement for Reports, Information and Records. Watermaster may require any party to furnish such reports, information and records as may be reasonably necessary to determine compliance or lack of compliance by any party with the provisions of this Judgment.

8.2.3 Requirement of Measuring Devices. Watermaster shall require all parties owning or operating any facilities for extraction of ground water from ULARA to install and maintain at all times in good working order, at such party's own expense, appropriate meters or other measuring devices satisfactory to the Watermaster.

8.2.4 Inspection by Watermaster. Watermaster shall make inspections of (a) ground water extraction facilities and measuring devices of any party, and (b) water use practices by any party under physical solution conditions, at such times and as often as may be reasonable under the circumstances to verify reported data and practices of such party. Watermaster shall also identify and report on any new or proposed new ground water extractions by any party or non-party.

8.2.5 Policies and Procedures. Watermaster shall, with the advice and consent of the Administrative Committee, adopt and amend from time to time Policies and Procedures as may be reasonably necessary to guide Watermaster in performance of its duties, powers and responsibilities under the provisions of this judgment.

8.2.6 Data Collection. Watermaster shall collect and verify data relative to conditions of ULARA and its ground water basins from the parties and one or more other governmental agencies. Where necessary, and upon approval of the Administrative Committee, Watermaster may develop supplemental data.

8.2.7 Cooperation With Other Agencies. Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts (including any party) to secure or exchange data to the end that the purpose of this Judgment, including its physical solution, may be fully and economically carried out.

8.2.8 Accounting for Non-consumptive Use. Watermaster shall calculate and report annually the non-consumptive and consumptive uses of extracted ground water by each party listed in Attachment "F."

8.2.9 Accounting for Accumulated Import Return Water and Stored Water. Watermaster shall record and verify additions, extractions and losses and maintain an annual and cummulative account of all (a) stored water and (b) import return water in San Fernando Basin. Calculation of losses attributable to Stored Water shall be approved by the Administrative Committee or by subsequent order of the Court. For purposes of such accounting, extractions in any water year by

Glendale, Burbank or San Fernando shall be assumed to be first from accumulated import return water, second from stored water, and finally pursuant to physical solution; provided, that any such city may, by written notice of intent to Watermaster, alter said priority of extractions as between import return water and stored water.

8.2.10 Recalculation of Safe Yield. Upon request of the Administrative Committee, or on motion of any party and subsequent Court order, Watermaster shall recalculate safe yield of any basin within ULARA. If there has been a material long-term change in storage over a base period (excluding any effects of stored water) in San Fernando Basin the safe yield shall be adjusted by making a corresponding change in native safe yield of the Basin.

8.2.11 Watermaster Report. Watermaster shall prepare annually and (after review and approval by Administrative Committee) cause to be served on all active parties, on or before May 1, a report of hydrologic conditions and Watermaster activities within ULARA during the preceding water year. Watermaster's annual report shall contain such information as may be requested by the Administrative Committee, required by Watermaster Policies and Procedures or specified by subsequent order of this Court.

8.2.12 Active Party List. Watermaster shall maintain at all times a current list of active parties and their addresses.

8.3 Administrative Committee.

8.3.1 Committee to be Formed. An Administrative Committee shall be formed to advise with, request or consent to, and review actions of Watermaster. Said Administrative Committee shall be composed of one representative of each party having a right to extract ground water from ULARA, apart from the physical solution. Any such party not desiring to participate in such committee shall so advise Watermaster in writing.

8.3.2 Organization and Voting. The Administrative Committee shall organize and adopt appropriate rules and regulations to be included in Watermaster Policies and Procedures. Action of the Administrative Committee shall be by unanimous vote of its members, or of the members affected in the case of an action which affects one or more basins but less than all of ULARA. In the event of inability of the Committee to reach a unanimous position, the matter may, at the request of Watermaster or any party, be referred to the Court for resolution by subsequent order after notice and hearing.

8.3.3 Function and Powers. The Administrative Committee shall be consulted by Watermaster and shall request or approve all discretionary Watermaster determinations. In the event of disagreement between Watermaster and the Administrative Committee, the matter shall be submitted to the Court for review and resolution.

8.4 Watermaster Budget and Assessments.

8.4.1 Watermaster's Proposed Budget. Watermaster shall, on or before May 1, prepare and submit to the Administrative Committee a budget for the ensuing water year. The budget shall be determined for each basin separately and allocated between the separate ground water basins. The total for each basin shall be allocated between the public agencies in proportion to their use of ground water from such basin during the preceding water year.

8.4.2 Objections and Review. Any party who objects to the proposed budget, or to such party's allocable share thereof, may apply to the Court within thirty (30) days of receipt of the proposed budget from Watermaster for review and modification. Any such objection shall be duly noticed to all interested parties and heard within thirty (30) days of notice.

8.4.3 Notice of Assessment. After thirty (30) days from delivery of Watermaster's proposed budget, or after the order of Court settling any objections thereto, Watermaster shall serve notice on all parties to be assessed of the amount of assessment and the required payment schedule.

8.4.4 Payment. All assessments for Watermaster expenses shall be payable on the dates designated in the notice of assessment.

8.5 Review of Watermaster Activities.

8.5.1 Review Procedures. All actions of Watermaster (other than budget and assessment matters, which are provided for in Paragraph 8.4.2) shall be subject to review by the Court on its own motion or on motion by any party, as follows:

8.5.1.1 Noticed Motion. Any party may, by a regularly noticed motion, apply to the Court for review of any Watermaster's action. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties.

8.5.1.2 De Novo Nature of Proceedings. Upon the filing of any such motion, the Court shall require the moving party to notify the active parties of a date for taking evidence and argument, and on the date so designated shall review de novo the question at issue. Watermaster's findings or decision, if any, may be received in evidence at said hearing, but shall not constitute presumptive or prima facie proof of any fact in issue.

8.5.1.3 Decision. The decision of the Court in such proceeding shall be an appealable supplemental order in this case. When the same is final, it shall be binding upon the Watermaster and all parties.

9. PHYSICAL SOLUTION

9.1 Circumstances Indicating Need for Physical Solution. During the period between 1913 and 1955, when there existed temporary surplus waters in the San Fernando Basin, overlving cities and private overlying landowners undertook to install and operate water extraction, storage and transmission facilities to utilize such temporary surplus waters. If the injunction against interference with the prior and paramount rights of Los Angeles to the waters of the San Fernando and Eagle Rock Basins were strictly enforced, the value and utility of those water systems and facilities would be lost or impaired. It is appropriate to allow continued limited extraction from the San Fernando and Eagle Rock Basins by parties other than Los Angeles, subject to assurance that Los Angeles will be compensated for any cost, expense or loss incurred as a result thereof.

9.2 Prior Stipulated Judgments. Several defendants heretofore entered into separate stipulated judgments herein, during the period June, 1958 to November, 1965, each of which judgments was subject to the Court's continuing jurisdiction. Without modification of the substantive terms of said prior judgments, the same are categorized and merged into this judgment and superseded hereby in the exercise of the Court's continuing jurisdiction, as follows:

9.2.1 Eagle Rock Basin Parties. Stipulating defendants Foremost and Deep Rock have extracted water from Eagle Rock Basin, whose entire safe yield consist of import return waters of Los Angeles. Said parties may continue to extract water from Eagle Rock Basin to supply their bottled drinking water requirements upon filing all required reports on said extraction with Watermaster and Los Angeles and paying Los Angeles annually an amount equal to $21.78 per acre foot for the first 200 acre feet, and $39.20 per acre foot for any additional water extracted in any water year.

9.2.2 Non-consumptive or Minimal-consumptive Operations. Certain stipulating defendants extract water from San Fernando Basin for uses which are either non-consumptive or have a minimal consumptive impact. Each of said defendants who have a minimal consumptive impact has a connection to the City of Los Angeles water system and purchases annually an amount of water at least equivalent to the consumptive loss of extracted ground water. Said defendants are:

Non-Consumptive

Walt Disney Productions

Sears, Roebuck & Co.

Minimal-Consumptive

Conrock Co., for itself and as successor to California Materials Co.; Constance Ray White and Lee L. White; Mary L. Akmadzich and Peter J. Akmadzich

Livingston Rock & Gravel, for itself and as successor to Los Angeles Land & Water Co.

The nature of each said defendant's water use practices is described in Attachment "F". Subject to required reports to and inspections by Watermaster, each said defendant may continue extractions for said purposes so long as in any year such party continues such non-consumptive or minimal-consumptive use practices.

9.2.3 Abandoned Operations. The following stipulating defendants have ceased extracting water from San Fernando Basin and no further need exists for physical solution in their behalf:

Knickerbocker Plastic Company, Inc.
Carnation Company
Hidden Hills Mutual Water Company
Southern Pacific Railroad Co.
Pacific Fruit Express Co.

9.3 Private Defendants. There are private defendants who installed during the years of temporary surplus relatively substantial facilities to extract and utilize ground waters of San Fernando Basin. Said defendants may continue their extractions for consumptive use up to the indicated annual quantities upon payment of compensation to the appropriate city wherein their use of water is principally located, on the basis of the following physical solution:

9.3.1 Private Defendants and Appropriate Cities. Said private defendants and the cities to which their said extractions shall be charged and to which physical solution payment shall be made are:

		Annual Quantities (acre feet)
Los Angeles -	Toluca Lake	100
	Sportsman's Lodge	25
	Van de Kamp	120
Glendale -	Forest Lawn	400
	Southern Service Co.	75
Burbank -	Valhalla	300
	Lockheed	25

Provided that said private defendants shall not develop, install or operate new wells or other facilities which will increase existing extraction capacities.

9.3.2 Reports and Accounting. All extractions pursuant to this physical solution shall be subject to such reasonable reports and inspections as may be required by Watermaster.

9.3.3 Payment. Water extracted pursuant hereto shall be compensated for by annual payment to Los Angeles, and as agreed upon pursuant to paragraph 9.3.3.2 to Glendale and Burbank, thirty days from day of notice by Watermaster, on the following basis:

9.3.3.1 Los Angeles. An amount equal to what such party would have paid had water been delivered from the distribution system of Los Angeles, less the average energy cost of extraction of ground water by Los Angeles from San Fernando.

9.3.3.2 Glendale or Burbank. An amount equal to the sum of the amount payable to Los Angeles under paragraph 9.4 hereof and any additional charges or conditions agreed upon by either such city and any private defendant.

9.4 Glendale and Burbank. Glendale and Burbank have each installed, during said years of temporary surplus, substantial facilities to extract and utilize waters of the San Fernando Basin. In addition to the use of such facilities to recover import return water, the distribution facilities of such cities can be most efficiently utilized by relying upon the San Fernando Basin for peaking supplies in order to reduce the need for extensive new surface storage. Glendale and Burbank may extract annual quantities of ground water from the San Fernando Basin, in addition to their rights to import return water or stored water, as heretofore declared, in quantities up to:

Glendale	5,500 acre feet
Burbank	4,200 acre feet;

provided, that said cities shall compensate Los Angeles annually for any such excess extractions over and above their declared rights at a rate per acre foot equal to the average MWD price for municipal and industrial water delivered to Los Angeles during the fiscal year, less the average energy cost of extraction of ground water by Los Angeles from San Fernando Basin during the preceding fiscal year. Provided, further, that ground water extracted by Forest Lawn and Southern Service Co. shall be included in the amount taken by Glendale, and the amount extracted by Valhalla and Lockheed shall be included in the amount taken by Burbank. All water taken by Glendale or Burbank pursuant hereto shall be charged against Los Angeles' rights in the year of such extractions.

In the event of emergency, and upon stipulation or motion and subsequent order of the Court, said quantities may be enlarged in any year.

9.5 San Fernando. San Fernando delivers imported water on lands overlying the San Fernando Basin, by reason of which said city has a right to recover import return water. San Fernando does not have water extraction facilities in the San Fernando Basin, nor would it be economically or hydrologically useful for such facilities to be installed. Both San Fernando and Los Angeles have decreed appropriative rights and extraction facilities in the Sylmar Basin. San Fernando may extract ground water from the Sylmar Basin in a quantity sufficient to utilize its San Fernando Basin import return water credit, and Los Angeles shall reduce its Sylmar Basin extractions by an equivalent amount and receive an offsetting entitlement for additional San Fernando Basin extractions.

9.6 Effective Date. This physical solution shall be effective on October 1, 1978, based upon extractions during water year 1978-79.

10. MISCELLANEOUS PROVISIONS

10.1 Designation of Address for Notice and Service. Each party shall designate the name and address to be used for purposes of all subsequent notices and service herein by a separate designation to be filed with Watermaster within thirty (30) days after Notice of Entry of Judgment has been served. Said designation may be changed from time to time by filing a written notice of such change with the Watermaster. Any party desiring to be relieved of receiving notices of Watermaster activity may file a waiver of notice on a form to be provided by Watermaster. Thereafter such party shall be removed from the Active Party list. For purposes of service on any party or active party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to such party or active party under or pursuant to the Judgment, such service shall be made personally or by deposit in the United States mail, first class, postage prepaid, addressed to the designee and at the address in the latest designation filed by such party or active party.

10.2 Notice of Change in Hydrologic Condition -- Sylmar Basin. If Sylmar Basin shall hereafter be in a condition of overdraft due to increased or concurrent appropriations by Los Angeles and San Fernando, Watermaster shall so notify the Court and parties concerned, and notice of such overdraft and the adverse effect thereof on private overlying rights shall be given by said cities as prescribed by subsequent order of the Court, after notice and hearing.

10.3 Judgment Binding on Successors. This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but also upon their respective heirs, executors, administrators, successors, assigns, lessees and licensees and upon the agents, employees and attorneys in fact of all such persons.

10.4 Costs. Ordinary court costs shall be borne by each party, and reference costs shall be borne as heretofore allocated and paid.

DATED: Jan 26, 1979.

Judge of the Superior Court

Sylmar Basin Stipulation

ORIGINAL

MICHAEL ESTRADA
City Attorney
CITY OF SAN FERNANDO

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REC'D
OCT 11 2006
FILING WINDOW

FILED
LOS ANGELES SUPERIOR COURT
DEC 14 2006
JOHN A. CLARKE, CLERK
BY M. J. ROLLINGS DEPUTY

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF LOS ANGELES–CENTRAL DISTRICT

CITY OF LOS ANGELES,
Plaintiff,
vs.
CITY OF SAN FERNANDO, ET AL.,
Defendant.

Case No C650079

~~[PROPOSED]~~ ORDER GRANTING MOTION TO APPROVE STIPULATION BETWEEN THE CITIES OF SAN FERNANDO AND LOS ANGELES REGARDING THE SAFE YIELD OF THE SYLMAR BASIN

Date: November 15, 2006
Time: 8:30 a.m.
Dept.: 52
Hon. Susan Bryant-Deason

[Exempt from Filing Fees Pursuant to Govt. Code §6103]

The motion of the City of San Fernando ("San Fernando") and the City of Los Angeles ("Los Angeles") to approve the stipulation dated October 10, 2006 entered between San Fernando and Los Angeles regarding the safe yield of the Sylmar Basin, came on regularly for hearing on ~~November 15,~~ December 13, 2006 2006 in Department 52 of the above-entitled court, the Hon. Susan Bryant-Deason presiding. The appearances of counsel are noted on the record.

Having considered the papers submitted by the parties, and the arguments of counsel thereon, the Court hereby approves he stipulation dated October 10, 2006 entered between San Fernando and Los Angeles regarding the safe yield of the Sylmar Basin is approved.

DATED: ~~October~~ Dec 13, 2006

Judge of the Superior Court

PROOF OF SERVICE

I, Kelley Herrington, declare:

I am a resident of the State of California and over the age of eighteen years, and not a party to the within action; my business address is Richards, Watson & Gershon, 355 South Grand, 40th Floor, Los Angeles, California. On October 11, 2006, I served the within documents:

[PROPOSED] ORDER GRANTING MOTION TO APPROVE STIPULATION BETWEEN THE CITIES OF SAN FERNANDO AND LOS ANGELES REGARDING THE SAFE YIELD OF THE SYLMAR BASIN

[ ] by causing facsimile transmission of the document(s) listed above from (213) 626-8484 to the person(s) and facsimile number(s) set forth below on this date before 5:00 P.M. This transmission was reported as complete and without error. A copy of the transmission report(s), which was properly issued by the transmitting facsimile machine, is attached. Service by facsimile has been made pursuant to a prior written agreement between the parties.

[X] by placing the document(s) listed above in a sealed envelope with postage thereon fully prepaid, in the United States mail at Los Angeles, California, addressed as set forth below. I am readily familiar with the firm's practice for collection and processing correspondence for mailing with the United States Postal Service. Under that practice, it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing contained in this affidavit.

[ ] by placing the document(s) listed above in a sealed envelope and affixing a pre-paid air bill, and causing the envelope to be delivered to a agent for delivery, or deposited in a box or other facility regularly maintained by , in an envelope or package designated by the express service carrier, with delivery fees paid or provided for, addressed to the person(s) at the address(es) set forth below.

[ ] by personally delivering the document(s) listed above to the person(s) at the address(es) set forth below.

[ ] by causing personal delivery by First Legal Support Services, 1511 West Beverly Boulevard, Los Angeles, California 90026 of the document(s) listed above to the person(s) at the address(es) set forth below.

See Attached Service List

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on October 11, 2006.

KELLEY HERRINGTON

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West Coast Basin - Judgement 506806

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Superior Court of California
County of Los Angeles

DEC 05 2014

Sherri R. Carter, Executive Officer/Clerk
By: Roxanne Arraiga, Deputy

Attorneys for Defendant
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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

CALIFORNIA WATER SERVICE COMPANY, et al.,

Plaintiff,

vs.

CITY OF COMPTON, et al.,

Defendant.

Case No. C 506 806
[Related to Case No. C 786656]

Assigned for All Purposes to the Honorable Kenneth R. Freeman (Dept. 310)

AMENDED JUDGMENT

Action Filed: 7/21/1945

The original judgment in this action was entered on August 18, 1961 ("Judgment"). Pursuant to the reserved and continuing jurisdiction of the Court under the Judgment, certain amendments to the Judgment and temporary orders have heretofore been made and entered.

Continuing jurisdiction of the Court under the Judgment is currently assigned to the Honorable Richard Freeman.

The motion of Defendants the City of Inglewood, the City of Long Beach, the City of Los Angeles, the City of Manhattan Beach, the City of Torrance, the California Water Service Company, and the Golden State Water Company, and Intervenors the West Basin Municipal Water District and the Water Replenishment District of Southern California, for further amendments to the Judgment, notice thereof and of the hearing thereon having been duly and regularly given to all Parties, came for hearing in Department 310 of the above-entitled Court on December 9, 2014 at 9:00 a.m., before said Honorable Freeman.

This "Amended Judgment" incorporates prior amendments to the Judgment made pursuant to the following Court orders: (1) Order Authorizing Temporary Mining Of Basin entered on or about June 2, 1977, (2) Order Authorizing Temporary Mining Of Basin entered on or about September 29, 1977, (3) Order approving Intervention After Judgment Of Hughes Aircraft Company As A Party Defendant And Amending Amended Judgment Herein entered on or about September 24, 1981, (4) Order Amending Judgment entered on or about March 8, 1989, (5) Order entered on or about July 6, 1993, and (6) Order Amending Judgment To Provide Exclusion Zone entered on or about December 21, 1995 (the "Prior Amendment Orders"). To the extent this Amended Judgment is a restatement of the Judgment as heretofore amended, the Prior Amendment Orders are incorporated into this Amended Judgment for convenience and not as a re-adjudication of the matters encompassed in the Prior Amendment Orders.

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 hereinabove are referred to 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. "*Administrative Body*" is defined in Section XI.2.A. The Administrative Body is one of the three bodies that comprises the Watermaster.

2. "*Administrative Year*" means the 12 (twelve) month period beginning July 1 and ending June 30.

3. "*Adjudicated Right*" means the right of a Party to produce groundwater in a quantity greater than 0 (zero) pursuant to the rights authorized under Section III of this Amended Judgment.

4. "*Adjudicated Storage Capacity*" means 70,900 acre-feet of the Available Dewatered Space, unless otherwise modified in accordance with Section V.1.A herein, which has been apportioned for use herein for Individual Storage Allocation, Community Storage Pool, and Regional Storage Allocation.

5. "*Amended Judgment*" means the Judgment, as amended to date.

6. "*Available Dewatered Space*" means up to 120,000 acre feet of dewatered space available to hold groundwater within the West Coast Basin that is allocated between Adjudicated Storage Capacity and Basin Operating Reserve.

7. "*Basin,*" "*West Basin,*" and "*West Coast Basin*" as these terms are interchangeably used herein, each means the ground water basin underlying the area described in Section I hereof.

8. "*Basin Operating Reserve*" means a total of 49,100 acre-feet of Available Dewatered Space, unless otherwise modified in accordance with Section V.1.A herein, available for Basin operations as provided in Section V.2. The Basin Operating Reserve added to the Adjudicated Storage Capacity equals the amount of Available Dewatered Space.

9. "*Carryover*" is defined in Section V.4.

10. "*Carryover Conversion*" means the process of converting water properly held as Carryover into Stored Water.

11. "*CEQA*" refers to the California Environmental Quality Act, Public Resources Code § 21000 *et seq.* and its implementing regulations set forth at California Code of Regulations, Title 14, Chapter 3, which regulations shall be referred to herein as the "CEQA Guidelines."

12. "*CEQA Review Document*" means the final Environmental Impact Report, Negative Declaration or Mitigated Negative Declaration, prepared by or on behalf of the lead agency under CEQA.

13. "*Community Storage Pool Allocation*" is defined in Section V.6.A.

14. "*Contributed Water*" means a specified amount of Stored Water that the person or entity who stores water agrees to not recapture and to allow to remain in the Basin.

15. "*Developed Water*" includes Imported Water and other non-native water supplies.

16. "*Existing Facilities*" means those facilities described in Exhibit C to this Amended Judgment as well as completed New Storage Facilities approved in accordance with this Amended Judgment.

17. "*Extraction*," "*extractions*," "*extracting*," "*extracted*," and other variations of the same noun and verb in either initial capital or all lower case, mean pumping, taking, diverting or withdrawing groundwater by any manner or means whatsoever from the West Coast Basin.

18. "*Individual Storage Allocation*" is defined in Section V.5.

19. "*Imported Water*" means water brought into the West Coast Basin area from a non-tributary source by a Party, and any predecessors in interest.

20. "*Majority Protest*" means a written protest filed with the Administrative Body of

the Watermaster by Parties holding a majority of all Adjudicated Rights.

21. "*Material Physical Harm*" means material physical injury or an appreciable diminution in the quality or quantity of groundwater available within the Basin to support extractions pursuant to Adjudicated Rights or the right to extract Stored Water that is demonstrated to be attributable to the placement, recharge, injection, storage, transfer or recapture of Stored Water, including, but not limited to, degradation of water quality, liquefaction, land subsidence and other material physical injury caused by elevated or lowered groundwater levels. Material Physical Harm does not include "economic injury" that results from other than direct physical causes, including any adverse effect on water rates, lease rates, or demand for water. Once fully mitigated, physical injury shall no longer be considered to be material.

22. "*MWD*" means the Metropolitan Water District of Southern California.

23. "*New Storage Facility*" means a physical facility that can be used to introduce Stored Water or water from a Water Augmentation Project into the Basin, including but not limited to aquifer storage and recovery wells, injection wells, percolation ponds and spreading basins, that are not listed on Exhibit C to this Amended Judgment. Once completed and approved in accordance with this Amended Judgment, a New Storage Facility shall be deemed an Existing Facility for purposes of this Amended Judgment.

24. "*Outgoing Watermaster*" means the State of California, Department of Water Resources.

25. "*Party*" or "*Parties*" means a Party or Parties to this action.

26. "*Person*" or "*persons*" include individuals, partnerships, associations, governmental agencies and corporations, and any and all types of entities.

27. "*Regional Benefit*" means a contribution to or an advantage obtained by the Basin, the public, or the environment, including but not limited to (i) Contributed Water; (ii) additional infrastructure such as production wells or transmission pipelines that can be used by other Parties or WRD to enhance reliability of water supplies; or (iii) monetary payments. If the Regional Benefit is Contributed Water, the Contributed Water must be physical, "wet" water left in the Basin, which may be used by WRD as a source of Replenishment Water and thereby reduce the

otherwise applicable Replenishment Assessment. The value of the Contributed Water will be determined by multiplying the amount of Contributed Water by the appropriate rate for Imported Water purchased or acquired by WRD in the Basin.

28. "*Regional Storage Project(s)*" are defined in Section V.7.

29. "*Regional Storage Allocation*" is defined in Section V.7.

30. "*Replenishment Assessment*" means the replenishment assessment imposed by WRD upon each acre-foot of groundwater extracted from the West Coast Basin pursuant to the WRD Act and in compliance with all other laws of the State of California and any other applicable laws. This Amended Judgment shall not determine nor affect the determination of whether a Replenishment Assessment is valid or invalid in the event that any Replenishment Assessment is challenged in a legal action.

31. "*Replenishment Water*" means water that, in accordance with the WRD Act, WRD affirmatively captures or procures to replenish the Basin by percolating or injecting water into the Basin or in-lieu by substituting surface water in-lieu of production and use of groundwater in accordance with the WRD Act. To the extent WRD hereafter creates new means of capturing naturally occurring water and causing such newly-captured water to replenish the West Coast Basin, such newly-captured replenishment water shall also be considered "Replenishment Water."

32. "*Space-Available Storage*" is defined at Section V.10.

33. "*Storage Panel*" means a bicameral body that consists of the: (i) West Coast Basin Water Rights Panel, and (ii) Board of Directors of WRD. The Storage Panel is one of three bodies that comprise the Watermaster.

34. "*Storage Project*" means a Technically Feasible activity pertaining to the placement, recharge, injection, storage, transfer or recapture of Stored Water in the Basin. Storage Project(s) includes Regional Storage Projects.

35. "*Stored Water*" or "*Store Water*" means water held within any portion of the Available Dewatered Space in the West Coast Basin as a result of spreading, injection, Carryover Conversion or water from a Water Augmentation Project, where there is an intention to

subsequently withdraw the water for reasonable and beneficial use pursuant to the Amended Judgment.

36. "*Technically Feasible*" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account environmental and technological factors.

37. "*Total Adjudicated Production Rights*" means the sum of a Party's Adjudicated Rights and any contractual right through lease or other agreement to extract and use the Adjudicated Right of another Party.

38. "*Water Augmentation Project*" means pre-approved Technically Feasible physical actions and management activities that are initiated after entry of this Amended Judgment that provide demonstrated appreciable increases in long-term annual groundwater yield of the Basin.

39. "*Watermaster*" is comprised of the: (i) Administrative Body, (ii) Water Rights Panel, and (iii) Storage Panel. The Watermaster is not a "public agency" or a "trustee agency" within the meaning of CEQA and CEQA Guidelines 15379 and 15386.

40. "*Water Purveyor*" 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 MWD, through a MWD-member agency, 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.

41. "*Water Rights Panel*" means one of the three bodies that comprise the Watermaster consisting of five (5) members from among representatives of the Parties holding Adjudicated Rights. Three (3) of the members shall be the elected officers of president, vice-president and treasurer of the West Basin Water Association and the remaining two (2) members shall be selected by the Board of Directors of the West Basin Water Association in accordance with Section XI.2.B of the Amended Judgment.

42. "Watermaster Rules" mean the Rules that the Watermaster shall adopt, subject to Court approval, pursuant to Section XI.1.E of the Amended Judgment.

43. "*WRD*" means the Water Replenishment District of Southern California, a public

corporation of the State of California (Division 18, commencing with Section 60000 of the Water Code).

44. "WRD Act" means the Water Replenishment District Act, California Water Code Sections 60000 *et seq.*

III. DECLARATION OF RIGHTS - WATER RIGHTS ADJUDICATED

A. Certain of the Parties and/or their successors in interest are the owners of Adjudicated Rights to extract water from the Basin, which Adjudicated Rights are of the same legal force and effect and without priority with reference to each other. The amount of such Adjudicated Rights, stated in acre-feet per year, of each of these Parties, as of the date of this Amended Judgment, is set forth in Exhibit A to this Amended Judgment and is hereby declared and established accordingly. Provided, however, that the Adjudicated Rights so declared and established shall be subject to the condition that the water produced, 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 Adjudicated 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.

B. Certain of the Parties have no Adjudicated Rights to extract water from the Basin. The name of each of said Parties, as of the date of this Amended Judgment, is listed in Exhibit A with a zero following its name, and the absence of such Adjudicated Rights in said Parties is hereby established and declared.

C. As provided in Exhibit B to this Judgment, there is hereby established a "nonconsumptive water use right" in the Basin, which is subordinate to the Adjudicated Rights set forth in Section III hereof and which right is exercisable only on specifically defined lands and cannot be separately conveyed or transferred apart therefrom.

D. As further provided in Exhibit B to this Judgment, any party herein may petition the Administrative Body, acting on behalf of 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.

IV. TRANSFERABILITY OF RIGHTS

All Adjudicated Rights decreed and adjudicated herein, and the right to extract Stored Water stored within the Basin pursuant to the provisions 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.

V. PHYSICAL SOLUTION – BASIN STORAGE, CARRYOVER, BASIN OPERATING RESERVE, AND EXCESS PRODUCTION

1. Determination of Available Dewatered Space

A. There exists within the Basin Available Dewatered Space which has not been optimally utilized for Basin management and storage of native water and Developed Water. The Court finds and determines that: (i) there is up to one hundred and twenty thousand (120,000) acre-feet of Available Dewatered Space in the Basin; (ii) use of the Available Dewatered Space will increase reasonable and beneficial use of the Basin by permitting the more efficient procurement and management of Replenishment Water and allowing Parties to have Stored Water in the Basin, thereby increasing the conservation of water and reliability of the water supply available to all Parties; and (iii) compliance with the terms, conditions and procedures set forth in this Amended Judgment is meant to prevent Material Physical Harm to the Basin associated with the use of the Available Dewatered Space for Stored Water. If the Court determines, pursuant to Section XIII of this Judgment, that the amount of Available Dewatered Space is more than or less than 120,000 acre-feet, then the Court shall equitably adjust the amount of the Basin Operating Reserve and Adjudicated Storage Capacity such that no more than 40.9% of the Available Dewatered Space is allocated to the Basin Operating Reserve. No Party shall Store Water in the Basin except in the Available Dewatered Space in conformity with this Amended Judgment.

B. It is essential that use of the Available Dewatered Space be undertaken for the greatest public benefit pursuant to uniform, certain and transparent regulation that encourages the conservation of water and reliability of the water supply, avoids Material Physical Harm, and promotes the reasonable and beneficial use of water. Accordingly, in the event the Watermaster becomes aware of the development of Material Physical Harm, or a reasonably foreseeable or

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imminent threat of the development of Material Physical Harm, relating to the use of the Available Dewatered Space, the Watermaster shall (i) promptly take all reasonably necessary action to cease or avoid such harm as authorized under this Amended Judgment and the Watermaster Rules, and (ii) notice a hearing within thirty (30) days before the Court and concurrently file a report with the Court, served on all Parties, which shall explain the relevant facts then known by the Watermaster relating to the Material Physical Harm, or imminent threat thereof, including without limitation, the location of the occurrence, the source or cause, existing and potential physical impacts or consequences of the identified or threatened Material Physical Harm, all actions taken by the Watermaster to cease or avoid such harm, and any other recommendations to remediate the identified or threatened Material Physical Harm.

C. To fairly balance the needs of the divergent interests of Parties having Adjudicated Rights in the Basin, on the one hand, and the role of WRD on the other hand, and in consideration of the shared desire and public purpose of removing impediments to the voluntary conservation, storage, exchange and transfer of water, the Available Dewatered Space is apportioned into complementary classifications of forty-nine thousand one hundred (49,100) acre-feet of Basin Operating Reserve and seventy thousand nine hundred (70,900) acre-feet of Adjudicated Storage Capacity as set forth in this Section V. The apportionment contemplates flexible administration of storage capacity where use is apportioned among competing needs, while allowing Available Dewatered Space to be used from time to time as Space-Available Storage, subject to the priorities specified in this Amended Judgment.

2. Basin Operating Reserve

A. It is in the public interest for WRD to prudently exercise its discretion to purchase, spread, and inject water, to provide for in-lieu replenishment, and otherwise to fulfill its replenishment function within the Basin in accordance with the WRD Act. Accordingly, this Amended Judgment expressly recognizes that WRD may use the Basin Operating Reserve to manage available sources of water and otherwise fulfill its replenishment functions. WRD may allow naturally occurring water to occupy the Basin Operating Reserve, as needed and in its discretion, but cannot thereupon assert ownership, control or possession over naturally occurring water as Replenishment Water or Stored Water. WRD's priority right to use the Basin Operating Reserve is not intended to allow WRD to sell or lease Stored Water within that portion of the Available Dewatered Space.

B. WRD shall have forty-nine thousand, one hundred (49,100) acre-feet of Available Dewatered Space as the Basin Operating Reserve in accordance with the WRD Act.

C. WRD shall have a first priority right to use the Basin Operating Reserve in accordance with the WRD Act. WRD's first priority right to the Basin Operating Reserve is absolute. To the extent that there is a conflict between WRD and any other Party regarding the availability of and desire to use any portion of the Basin Operating Reserve, the interests of WRD will prevail. Any dispute as to the use of any portion of the Basin Operating Reserve shall be heard directly by the Court, after notice of hearing served on all Parties.

D. To the extent WRD does not require the use of some or all of the Basin Operating Reserve, that portion of the Basin Operating Reserve that is not then being used shall be available for Space-Available Storage in accordance with Section V.10 of this Amended Judgment and provided that such Space-Available Storage will not impede WRD's use of the Basin Operating Reserve. WRD's failure to use any portion of the Basin Operating Reserve for any time will not cause forfeiture or limit WRD's absolute right to make use of the Basin Operating Reserve in the future without compensation. Nothing herein shall permit WRD to limit or encumber its right to use the Basin Operating Reserve in accordance with the WRD Act.

3. Adjudicated Storage Capacity

The Adjudicated Storage Capacity is further allocated among the following classifications of Stored Water:

- Individual Storage Allocation: twenty-five thousand eight hundred (25,800) acre-feet.
- Community Storage Pool: thirty-five thousand five hundred (35,500) acre-feet.
- Regional Storage Allocation: nine thousand six hundred (9,600) acre-feet.

4. Carryover

A. In order to add flexibility to the operation of this Amended Judgment and to assist in a physical solution to meet the water requirements in the West Coast Basin, each of the Parties who is adjudged to have an Adjudicated Right and who, by the end of an Administrative Year, does not extract from the Basin all of such Party's Total Adjudicated Production Right, is permitted to carry over from such Administrative Year the right to extract from the Basin in the immediately following Administrative Year an amount of water equivalent to the amount of its Total Adjudicated Production Right that exceeds the amount of its actual extraction during said Administrative Year of water pursuant to its Total Adjudicated Production Right (hereinafter referred to as "Carryover"). Carryover, as computed above for a Party, shall be reduced by the quantity of Stored Water then held in the Available Dewatered Space by that Party at the commencement of the immediately following Administrative Year, although such reduction shall not cause the amount of Carryover to be less than 20% of the Party's Total Adjudicated Production Right.

B. A Party having Carryover may, from time to time, elect to convert all or part of such Party's Carryover to Stored Water, as authorized herein, upon payment of the Replenishment Assessment to WRD. The WRD shall maintain, account and use the Replenishment Assessment paid for Carryover Conversion in accordance with the provisions of Section XI.2(A)(5) of this Amended Judgment. Such Stored Water shall be assigned to that Party's Individual Storage Allocation, if available, and otherwise to the Community Storage Pool, and thereafter to then existing excess capacity within other Individual Storage Allocation, the Regional Storage Allocation, and only then if all remaining space is fully occupied, to the Basin Operating Reserve for Space-Available Storage.

C. 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 (including any successor in interest) can Carryover until utilized any Adjudicated Right (including any authorized Carryover from prior years) unexercised during said water years. This Amended Judgment shall not abrogate the rights of any additional Carryover of unused Adjudicated Rights of the Parties as may exist pursuant to the Orders filed as of June 2, 1977 and September 29, 1977.

5. Individual Storage Allocations

A. Up to twenty-five thousand eight hundred (25,800) acre-feet of Available

Dewatered Space is apportioned among the Parties as "Individual Storage Allocation" for the purpose of providing each Party holding an Adjudicated Right under the Amended Judgment with a first priority right to use an amount of that Available Dewatered Space equal to approximately forty percent (40%) of their respective Adjudicated Right. Water may be deposited into storage and assigned to an Individual Storage Allocation either through Carryover Conversion or by other means authorized under the Amended Judgment. The Individual Storage Allocation will be held in the name of the Party holding the Adjudicated Right upon notice to the Storage Panel. To the extent a Party does not require the use of some or all of its Individual Storage Allocation, that portion of the Individual Storage Allocation that is not then being used shall be available for Space-Available Storage as provided in Section V10.A.

B. A Party's first priority right to its Individual Storage Allocation is absolute. To the extent that there is a conflict between a Party holding an Adjudicated Right and any other Party or WRD regarding the availability of and desire to use any portion of their Individual Storage Allocation, the interests of the Party with the Individual Storage Allocation will prevail. Any dispute as to the use of any portion of a Party's Individual Storage Allocation shall be heard directly by the Court, after notice of hearing served on all Parties.

6. Community Storage Pool

A. Up to thirty-five thousand five hundred (35,500) acre-feet of Available Dewatered Space is apportioned for the use by all Parties to the Amended Judgment with Adjudicated Rights on a shared or community basis, hereafter referred to as the "Community Storage Pool." A Party that has fully occupied its Individual Storage Allocation may, on a first-in time, first in right basis (subject to the limits expressed below) place water into storage in the Community Storage Pool upon notice to the Storage Panel. So long as there is available capacity in the Community Storage Pool, any Party may store water in the Community Storage Pool, through Carryover Conversion as provided herein or by any other means authorized under the Amended Judgment, provided such Party has first fully occupied that Party's available Individual Storage Allocation.

B. So long as there is adequate storage capacity available within the

Community Storage Pool, any Party may store water through any authorized method up to the prescribed limits of available capacity within the Community Storage Pool upon notice to the Storage Panel.

C. After a Party effectively occupies Available Dewatered Space within the Community Storage Pool and then withdraws water from the Community Storage Pool, that Party shall be allowed a period of twenty-four (24) months to completely refill the vacated storage capacity before the capacity will be determined abandoned and available for use by other Parties. However, once the Basin's Community Storage Pool has been filled (35,500 acre-feet in storage), a Party may exercise its twenty-four (24) month refill priority only once, and thereafter only provided there is then capacity available to permit that Party to refill the vacated space. Except as to space subject to the refill right, as provided herein, all access to the Community Storage Pool shall be made available pursuant to a basis of first in time, first in right.

D. A Party that has maintained Stored Water in the Community Storage Pool for ten (10) consecutive years shall be subject to the following provisions whenever the Community Storage Pool is at least twenty-five percent (25%) occupied with Stored Water based on an aggregate of all Parties holding Adjudicated Rights who have Stored Water in the Community Storage Pool: (i) the Party may elect to have that Stored Water deemed transferred to Space-Available Storage in accordance with Section V.10 of this Amended Judgment, but if such an election is not made or there is no Space-Available Storage, then (ii) the Stored Water shall be deemed extracted first in advance of all other extraction rights in subsequent years (notwithstanding the order of production set forth in Section IX.2) until the Party's entire Community Storage account has been extracted. After the Stored Water is either transferred to Space Available Storage or extracted as provided herein, then said Party may thereafter make a renewed use of Community Storage on terms equal to other Parties on a first in time, first in right, and space-available basis.

7. **Regional Storage Allocation**

A. Up to nine thousand six hundred (9,600) acre feet of Available Dewatered Space in the West Coast Basin (the "Regional Storage Allocation") is designated for "Regional

Storage Project(s)" that: (i) do not constitute Water Augmentation Projects by enhancing the long-term reliable yield of the Basin; and (ii) require storage capacity in excess of Individual Storage Allocations and the Community Storage Pool.

B. Regional Storage Projects must be pre-approved by the Storage Panel of the Watermaster, as provided in Section V.12. The Storage Panel shall not approve a Regional Storage Project unless the applicant demonstrates (i) a proposed place of use and beneficial use for the water identified at the time of storage, and (ii) that the Regional Storage Project is Technically Feasible, will not cause Material Physical Harm and will confer a "Regional Benefit".

C. It is anticipated that Regional Storage Projects will be the principal category of storage for potential Storage Projects sponsored by, or for the benefit of, entities that do not hold an Adjudicated Right, although any Party to the Judgment may also propose a Regional Storage Project. Any entity which is not a Party to the Judgment who receives approval of a Regional Storage Project shall intervene into the Judgment as a Party prior to commencing the Regional Storage Project. A Regional Storage Project approved by the Storage Panel that occupies space within the nine thousand six hundred (9,600) acre-feet of Available Dewatered Space shall have a priority right to occupy the Regional Storage Allocation over any other use being made on a space-available basis.

D. Regional Storage Projects may include in-lieu, Carryover Conversion, physical improvements, recharge of "wet water" by spreading or injection, reducing the overall cost for the WRD to perform its replenishment function, and other measures that propose to make beneficial use of the designated storage capacity.

E. Parties receiving a right to Store Water pursuant to an approved Regional Storage Project shall have the first priority right to Regional Storage Allocation. Stored Water held in the Regional Storage Allocation by a Party with an Adjudicated Right as Space-Available Storage is subject to the limits of an annual extraction of one hundred and twenty percent (120%) of the storing Party's Total Adjudicated Production Right or as otherwise specified in accordance with Section IX.1 herein.

F. To the extent that some or all of the Regional Storage Allocation is unused, that portion of the Regional Storage Allocation that is not then being used shall be available for Space-Available Storage as provided in Section V10.A.

8. Limitations on Storage

A. Irrespective of the category of storage utilized, each Party with an Adjudicated Right shall not cumulatively have in storage in the Available Dewatered Space at any time Stored Water totaling more than two hundred percent (200%) of that Party's Adjudicated Right. However, a Party with an Adjudicated Right less than 100 acre feet may store water in the Available Dewatered Space up to 200 acre feet.

B. Notwithstanding the foregoing, a Party with an Adjudicated Right may store additional water up to 50% of its Adjudicated Right in excess of the aforementioned limit of 200% of its Adjudicated Right in Space-Available Storage as provided in Section V.10 of this Amended Judgment for a cumulative total of up to 250% of the Party's Adjudicated Right. Any Party with an Adjudicated Right seeking to store water in excess of 200% of its Adjudicated Right shall apply for additional storage from the Storage Panel, which shall determine whether additional storage space is available in light of the amount of storage space being utilized by all Parties and providing adequate protection for planned or anticipated storage projects by other Parties. The Storage Panel shall establish requirements as part of the Watermaster Rules including providing notice of such applications to all Parties, a means for objection, standards for granting or denying such requests, and promulgate requirements governing the extraction of the additional storage.

C. A Party without an Adjudicated Right who holds rights to store water in the Regional Storage Allocation by virtue of an approved Regional Storage Project shall comply with any extraction limits established by the Storage Panel in its approval of said Regional Storage Project. Subject to the foregoing, the right to extract Stored Water in the Basin may be freely transferred to another Party to this Amended Judgment, as permitted by Section IV.

9. Extraction of Stored Water; Exemption from Replenishment Assessment

The Court finds and declares that the extraction of Stored Water as permitted hereunder does not constitute "production of groundwater" within the meaning of Water Code Section 60317 and that no Replenishment Assessment shall be levied on the extraction of Stored Water. This determination reflects the practical application of certain provisions of this Amended Judgment concerning storage of water and extraction of Stored Water, including without limitation the following: (1). payment of the Replenishment Assessment is required upon Carryover Conversion, which allows WRD to replenish the Basin (as addressed under Section V.4(B); (2) Developed Water introduced into the Basin through spreading or injection for storage by or on behalf of a Party using Individual Storage Allocation or Community Storage Pool (as authorized under Sections V.5 and V.6), or pursuant to a Water Augmentation Project (as authorized under Section V.11), which needs not be replenished by WRD requiring payment of the Replenishment Assessment; and (3) with respect to Regional Storage Projects, a Regional Benefit must be established as a prerequisite of such a project, the water from which need not be replenished by WRD requiring payment of the Replenishment Assessment.

10. Space-Available Storage, Relative Priority, and Dedication of Abandoned Water

A. To balance the need to protect first priority uses of storage and to encourage the full utilization of the Adjudicated Storage Capacity and the Basin Operating Reserve within the Available Dewatered Space, any Party with an Adjudicated Right may make interim, temporary use of then currently unused Available Dewatered Space within (i) any category of Adjudicated Storage Capacity, and then (ii) if all Adjudicated Storage Capacity is being fully used for Stored Water, then within the Basin Operating Reserve ("Space-Available Storage"), subject to the following criteria:

(1) Any Party with an Adjudicated Right may engage in Space-Available Storage without prior approval from the Storage Panel of the Watermaster provided that the storing Party or Parties with an Adjudicated Right shall assume all risks of waste and loss regardless of the hardship.

(2) No Party with an Adjudicated Right may use any portion of the Basin Operating Reserve for Space-Available Storage unless that Party with an Adjudicated Right has already maximized its allowed storage pursuant to its Individual Storage Allocation and all available Community Storage and Regional Storage is already in use.

(3) Space-Available Storage shall first utilize unused storage space within the Individual Storage Allocation category, subject to the provisions in this Amended Judgment, and the Regional Storage Allocation before utilizing any available unused storage space within Community Storage. No utilization of Community Storage under Space-Available Storage shall be counted in making determinations under Sections V.6.C. or V.6.D.

(4) Whenever the Administrative Body determines that a Party with an Adjudicated Right is making use of excess Available Dewatered Space for Space-Available Storage without prior approval from the Storage Panel, the Administrative Body shall issue written notice to the Party with an Adjudicated Right informing them of the risk of loss and inform that Party what space (Individual Allocation, Regional Storage, Community Pool or Basin Operating Reserve) it is occupying on a Space-Available basis.

(5) Use of Space-Available Storage shall be administered in accordance with the rule of first in time, first in right. The Party with an Adjudicated Right holding the lowest priority right in Space-Available Storage shall assume responsibility for evacuating their Stored Water as may be necessary to accommodate a Party with an Adjudicated Right holding superior priority right. Any dispute concerning Space-Available Storage priorities, except as to Basin Operating Reserve or the Individual Storage Allocation, shall be submitted first to the Storage Panel for hearing and determination. The Storage Panel's determination, or lack thereof, may be appealed by motion to the Court by any Party to the dispute. Any dispute concerning the Community Storage Pool Allocation or the Regional Storage Allocation shall be submitted first to the Storage Panel for hearing and determination. The Storage Panel's determination, or lack thereof, may be appealed by motion to the Court by any Party to the dispute.

(6) Whenever the Available Dewatered Space is needed to accom-

modate the priority use within a respective category of Adjudicated Storage Capacity, or WRD seeks to make use of its priority right to the Basin Operating Reserve to fulfill its replenishment function, the Storage Panel shall issue a notice to evacuate within ninety (90) days the respective category of Adjudicated Storage Capacity or Basin Operating Reserve. Within sixty (60) days after receipt of such a notice to evacuate, the Party with an Adjudicated Right receiving the notice may provide a written election to the Storage Panel that it will store its Stored Water in any other excess Available Dewatered Space first within the Adjudicated Storage Capacity, if available, and then if all Adjudicated Storage Capacity is being fully used for Stored Water, then within the Basin Operating Reserve, if available. The Party with an Adjudicated Right's Stored Water shall be deemed spilled and dedicated to the Basin in furtherance of replenishment of the Adjudicated Rights without compensation if the Party with an Adjudicated Right does not make a timely election or if there is no excess Available Dewatered Space. No Stored Water will be deemed so dedicated unless the cumulative quantity of water held as Stored Water in the Available Dewatered Space exceeds one hundred and twenty thousand (120,000) acre-feet in the West Coast Basin. Any dispute as to Stored Water threatening to be spilled or dedicated to the Basin shall be submitted to the Court pursuant to a motion by any Party to the dispute after to the expiration of sixty (60) days of the ninety-day period in the notice to evacuate.

B. A Party with an Adjudicated Right that seeks to convert the Stored Water held as Space-Available Storage to a more firm right, may in their discretion, contract for the use of another Party with an Adjudicated Right's Individual Storage Allocation, or may apply for approval of its request as a Regional Storage Project, or may add such water to the Community Storage Pool once space therein becomes available.

11. Water Augmentation

A. Physical and management actions of the Parties in consultation with WRD shall add to the long-term reliable yield of the Basin. Innovations and improvements in management practices that increase the conservation and maximization of the reasonable and beneficial use of water should be promoted. To the extent that Parties to the Amended Judgment in consultation with WRD implement a project that provides additional long-term reliable water supply to the West Coast Basin, the annual extraction rights in the West Coast Basin will be increased commensurately in an amount to be determined by the Storage Panel to reflect the actual yield enhancement associated with the project. Augmented supplies of water resulting from such a project may be extracted or stored as permitted in this Amended Judgment in the same manner as other water.

B. Participation in any Water Augmentation Project shall be voluntary. The terms of participation will be at the full discretion of the participating Parties. Parties who propose a Water Augmentation Project ("Project Leads") may do so in their absolute discretion, upon such terms as they may determine and with Storage Panel approval. All other Parties will be offered a reasonable opportunity to participate in any Water Augmentation Project on condition that they share proportionately in generally common costs and benefits, and assume the obligation to bear exclusively the cost of any improvements that are required to accommodate their individual or peculiar needs.

C. Advance written notice shall be provided which reasonably describes the potential project and the proposed terms under which a Party may "opt-in." Parties shall be afforded a reasonable time under the then prevailing circumstances for appropriate deliberation and action by the Parties. Disputes as to the adequacy of the notice and the time for project approval may be referred to the Storage Panel and then to the Court under its continuing jurisdiction.

D. Parties may elect, in their discretion, to opt into a Water Augmentation Project ("Project Participants") so long as they agree to offer customary written and legally binding assurances that they will bear their proportionate share of all costs attributable to the Water Augmentation Project or provide other valuable consideration that is deemed sufficient by the Project Leads and Project Participants.

E. All Water Augmentation Projects must be pre-approved by the Storage Panel, as provided in Section V.12. The Storage Panel shall determine the amount of additional groundwater extraction authorized as a result of a Water Augmentation Project, which determination shall be based upon substantial evidence. The amount of additional groundwater extraction shall not exceed the amount by which the Water Augmentation Project will increase the long-term sustainable yield of the Basin. No extraction right shall be established and no extraction shall occur until new water has been actually introduced into the Basin as a result of the Water Augmentation Project. Any approval for a Water Augmentation Project shall include provisions: (i) requiring regular monitoring to determine the actual amount of such new water made available; (ii) requiring make up water or equivalent payment therefore to the extent that actual water supply augmentation does not meet projections; and (iii) adjusting water rights attributable to the Water Augmentation Project to match the actual water created. Any approval for a Water Augmentation Project shall be based on a finding the Water Augmentation Project is Technically Feasible and will not cause Material Physical Harm.

F. The right to extract augmented water from the Basin pursuant to a Water Augmentation Project shall be accounted for separately and shall not be added to a Party's Adjudicated Right.

G. A Party that elects to participate and pays its full pro-rata share of costs associated with any Water Augmentation Project, and/or reaches an agreement with other participants based upon other valuable consideration acceptable to the Lead Parties and the remaining Project Participants, will receive a proportionate right to extract the water resulting from the Water Augmentation Project.

H. A Party that does not elect to participate ("Non-Participating Party") will not receive a right to extract water resulting from to the Water Augmentation Project. Non-Participating Parties will not be required to pay any costs, fees or assessments of any kind attributable to the respective Water Augmentation Project including the fees required hereunder for the Watermaster duties or directly or indirectly as the WRD Replenishment Assessment.

I. Because water made available for Water Augmentation will be produced annually, fluctuations in groundwater levels will be temporary, nominal, and managed within the Basin Operating Reserve.

J. WRD shall not obtain any extraction right or other water right under the Amended Judgment by virtue of its consultation in any Water Augmentation Project.

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12. Storage Procedure

A. Storage Reporting and Monitoring

The Administrative Body (defined below) shall: (i) prescribe forms and procedures for the orderly reporting of Stored Water and water from a Water Augmentation Project; (ii) maintain records of all water stored in the Basin; (iii) undertake the monitoring and modeling of Storage Projects, Water Augmentation Projects and New Storage Facilities required by this Judgment; and (iv) provide an accounting of Stored Water and/or water from a Water Augmentation Project within thirty (30) days of a written request by an Adjudicated Rights holder or a Party with rights to Stored Water. For purposes of Sections V.12 and V.13 of this Amended Judgment, Water Augmentation Project(s), New Storage Facilities and Storage Projects that require the approval of the Storage Panel shall collectively be referred to as "Projects."

B. Application and Notification Procedure

(1) Nothing in this Amended Judgment shall alter a Party's duty to comply with CEQA or any other applicable legal requirements as to any Project imposed by applicable law. Further, no action or approval under this Amended Judgment shall constitute a bar to a Party's duty to comply with CEQA or any other legal requirements as to any Project imposed by applicable law. However, a Party to this Amended Judgment who is undertaking or engaging in CEQA review for a Project that requires approval by the Storage Panel shall provide to the Watermaster copies of the notices required under CEQA to be provided to the public within the time periods proscribed by CEQA.

(2) For Projects that require review and approval by the Storage Panel, as provided in Section V.13, the Administrative Body shall provide appropriate applications, and shall work with Project applicant(s) to complete the application documents for presentation to the Storage Panel.

(3) The Administrative Body shall conduct the groundwater modeling necessary to support a Party's application for approval of a Project prior to the Storage Panel's hearing on said Project. Upon receipt of a notice of a lead agency's intention to prepare a CEQA Review Document, the Administrative Body shall conduct the modeling described in Section

V.12 of this Amended Judgment and submit such modeling to the lead agency for inclusion in the proposed or draft CEQA documentation and the CEQA Review Document, subject to the Party's payment of the costs of that modeling. Such modeling is not required to be conducted by the Administrative Body if the Administrative Body and the Chair of the Water Rights Panel determine in writing that (i) the likely rise in water levels from the proposed Project would be minimal, (ii) other evidence (including any modeling prepared by the Project proponent) demonstrates that the Project will not cause Material Physical Harm after consideration of the factors outlined in Section V.13.B(3), and (iii) an Environmental Impact Report is not required under CEQA. If the Administrative Body and the Chair of the Water Rights Panel make such a determination, they shall promptly inform the entire Storage Panel. Such modeling shall thereafter be conducted by the Administrative Body if either the Water Rights Panel or the Board of Directors of WRD request that such modeling be conducted.

(4) The Party which is the proponent of a proposed Project shall bear all costs associated with the Watermaster's preparation and review of the application for approval of the Project and all costs associated with its implementation, including reimbursement of fees and costs incurred by the Administrative Body in conducting the necessary modeling and other technical studies.

(5) Within 30 days of receipt of an application for a Project or any notification(s) associated with the CEQA review for such Project, the Administrative Body shall provide written notice (either by electronic mail or U.S. postal mail) and access to a copy of the Project application and/or any available CEQA documentation, including the CEQA Review Document, to all Parties to the Amended Judgment. Any Party to the Amended Judgment shall be entitled to submit its own report related to the Project, and the Administrative Body shall consider such report in its processing of the Project application.

(6) As part of the application process, the Administrative Body shall cause the preparation of any study or analysis necessary to determine that the Project is Technically Feasible and will not cause Material Physical Harm, including the appropriate modeling of the cumulative effect of the particular Project on water levels in the West Basin. The

Administrative Body may rely on CEQA documentation, including the CEQA Review Document, for a Project for the information necessary to make a determination on Technical Feasibility and Material Physical Harm and not prepare any additional analyses if the CEQA documentation contains the necessary information for consideration of the Project including the groundwater modeling required by this Amended Judgment.

C. Notice Process

Within thirty (30) days after submission of the final and complete Project application documents (including the technical reports, CEQA Review Document and modeling results), the Administrative Body shall provide notice (either by electronic mail or U.S. postal mail), and access to copies of the final and complete application documents to all Parties to the Amended Judgment.

13. Review/Approval Process

A. Projects Subject to Review

(1) Storage Projects exempt from the review and approval process provided in this Section V.13 include:

- use of Total Adjudicated Production Rights, except for extraction above one hundred and twenty percent (120%) of a Party's extraction right, as set out in Section IX.1;
- replenishment of the Basin with Replenishment Water by WRD;
- WRD's operations within the Basin Operating Reserve;
- Carryover Conversion; and
- Use of Existing Facilities to store water in the Individual Storage Allocation or the Community Storage Pool.

(2) All other Projects shall be subject to review and approval, as provided in this Section V.13, including, but not limited to, those projects involving:

- material variances to substantive criteria governing projects exempt from the review and approval process;
- modifications to previously approved Projects and related agreements;

- a Party's proposal for Carryover Conversion in quantities greater than the express apportionment of Adjudicated Storage Capacity on a non-priority, space-available, interim basis, and
- any other means of storage not exempt by Section V.13.A(1).

B. Hearing and Approval Process for Watermaster Review

The following procedures shall be followed by the Watermaster where Storage Panel review is required or permitted under this Amended Judgment.

(1) No later than thirty (30) days after notice has been issued in accordance with Section V.12, the matter shall be set for hearing before the Storage Panel. A staff report shall be submitted by the Administrative Body in conjunction with the completed application documents, which report shall include proposed conditions of approval if the recommendation in the staff report is to approve the Project. The Water Rights Panel may prepare a separate independent staff report, if it elects to do so. Any Party to the Amended Judgment shall be entitled to submit its own report, and such report shall be considered by the Storage Panel as part of its review; however, a Party shall not be entitled to raise issues to the Storage Panel that it failed to raise as part of any previously completed CEQA process for the Project under consideration by the Storage Panel.

(2) Whenever feasible, the WRD Board of Directors and the Water Rights Panel shall conduct a joint hearing (i.e., the presumption shall be in favor of joint hearings). If a joint hearing is not held, the Water Rights Panel hearing shall be conducted in the manner prescribed for public agency hearings under the Brown Act.

(3) Factors to be considered in reviewing a Project include (i) facilities in the vicinity of the Project; (ii) proximity to drinking water wells and depths at which such wells are screened; (iii) depth at which water will be added under the Project; (iv) resulting groundwater elevations from the Project based on groundwater modeling conducted by the Administrative Body and, if they elect to do so, the Project proponent, (v) existing contamination, if any, in the vicinity of the Project; (vi) preferential groundwater pathways; (vii) the source of the water for the Project; and (v) information provided by any Party.

(4) The WRD Board of Directors and the Water Rights Panel shall each adopt written findings explaining their decision on the Project, although if both entities reach the same decision, they shall work together to adopt a uniform set of findings. The findings must include the evaluation of the factors identified in Section V.13.B(3) and a determination that the Project is Technically Feasible and will not cause Material Physical Harm.

(5) The Storage Panel shall not be required to conduct a hearing on a Project if it (i) reviews the CEQA Review Document adopted by a lead agency; (ii) the CEQA Review Document includes the groundwater modeling required under this Amended Judgment; (iii) determines that the CEQA Review Document evaluated the factors identified in Section V.13.B(3); and (iv) determines that the CEQA Review Document demonstrates that the Project is Technically Feasible and will not cause Material Physical Harm.

(6) Unless both the WRD Board of Directors and Water Rights Panel approve the Project, the application shall be deemed denied (a "Project Denial"), provided, however, that if either the WRD Board of Directors or the Water Rights Panel is unable to render a decision on the application due to a conflict of interest arising under Section V.13 (A)(8) of this Amended Judgment, then the application shall be deemed approved if the remaining body of the Storage Panel approves the application. If both the WRD Board of Directors and Water Rights Panel approve the Project, the Project shall be deemed approved (a "Project Approval").

(7) If the Storage Panel approves the Project, it may impose reasonable conditions of approval on matters relevant to the Project, which shall include mandatory conditions of approval including annual limits on the amount of Stored Water, annual extraction limits of Stored Water, and water quality standards. The WRD Board of Directors and the Water Rights Panel shall work together to adopt a uniform set of conditions of approval promulgated after adoption of the Rules pursuant to Section X.1(E) and following the same review and comment process set forth in Section XI.1(E).

(8) Neither WRD nor any member of the Water Rights Panel shall render any decision on Projects subject to Watermaster review under Section V.13 of this Amendment Judgment if said entity has a conflict of interest under applicable law or the rules and

regulations promulgated pursuant to Section XI.1(E) with respect to said Project.

(9) Any factual determinations made by the Watermaster, or any constituent body thereof, pursuant to this section, shall be based on the substantial evidence test.

C. Trial Court Review

An applicant, Adjudicated Rights holder or a Party holding rights to Stored Water may seek the Storage Panel's reconsideration of a Project Denial or Project Approval. However, there shall be no process for mandatory reconsideration or mediation of a Project Approval or a Project Denial either before the Administrative Body or the Water Rights Panel. Any Party may file an appeal from a Project Approval or Project Denial with this Court, as further described in Section XI.4.D. The Trial Court shall review the decisions of the Watermaster, Storage Panel and Water Rights Panel in accordance with Section XI.4(D)

14. Excess Production

In order to meet possible emergencies, each of the Parties who is adjudged to have an Adjudicated Right and not possessing Stored Water, is permitted to extract from the Basin in any Administrative Year for beneficial use an amount in excess of each such Party's Total Adjudicated Production Rights not to exceed two (2) acre-feet or ten percent (10%) of such Party's Total Adjudicated Production Rights, whichever is the larger, and in addition thereto, such greater amount as may be approved by the Court. Notwithstanding Section XI.4 herein, if such greater amount is recommended by the Water Rights Panel, such order of Court may be made *ex parte*. Each such Party so extracting water in excess of its Total Adjudicated Production Rights shall be required to reduce its extractions below its Total Adjudicated Production Rights by an equivalent amount in the Administrative 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 its extractions by the amount of the excess theretofore extracted by such Party.

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VI. PHYSICAL SOLUTION - EXCHANGE POOL

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 Administrative Year, each Party having supplemental water available to it through then existing facilities, other than water which any such Party has the right to extract hereunder, shall file with the Water Rights Panel 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 Administrative 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 it.

2. Basis of Offer to Exchange Pool; Redetermination of Offer by Water Rights Panel

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 Water Rights Panel, who may take into consideration the prior use by such Party for earlier Administrative Years and all other factors indicating the amount of such total required use and the availability of replacement water.

3. Voluntary Offer to Exchange Pool

Any Party filing an offer to release water under the mandatory provisions of this Section 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 Amended 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 Amended 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 Administrative Year.

4. Price of Water Offered to Exchange Pool

Each offer to release water pursuant to this Section VI shall be the price per acre-foot declared and determined at the time of the filing of such offer by the releasing Party; provided that:

(a) such price per acre-foot shall not exceed the price that 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) 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 MWD and West Coast Basin Municipal Water District to municipalities and public utilities for water received from MWD.

5. Price Dispute Objection - Water Rights Panel Determination

A. In the event of a dispute as to any price at which water is offered for release, any Party affected thereby may, within thirty (30) days thereafter, by an objection in writing, refer the matter to the Water Rights Panel for determination. Within thirty (30) days after such objection is filed, the Water Rights Panel shall consider said objection and shall make its finding as to the price at which said water should be offered for release and notify all Parties.

B. The costs of such determination shall be apportioned or assessed by the Water Rights Panel in its discretion between or to the Parties to such dispute, and the Water Rights Panel 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 Water Rights Panel funds sufficient to pay the cost of such determination.

C. Any Party may appeal to the Court from a decision of the Water Rights Panel as provided in Section XI.4. Pending the Court's determination if the water so offered has been allocated, the Party making the offer shall be paid the price declared in its offer, subject to appropriate adjustment upon final determination.

6. Request for Water From Exchange Pool

A. Not less than sixty (60) days prior to the beginning of each Administrative

Year, any Party whose estimated demand for water during the ensuing Administrative Year exceeds the sum of all of the Party's supplies available to it from the Basin under this Amended Judgment, may file with the Water Rights Panel a request for the release of water in the amount that said estimated demand exceeds 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 Water Rights Panel.

B. Within thirty (30) days thereafter, the Water Rights Panel shall advise, in writing, those Parties requesting water of the estimated price thereof. Any Party desiring to amend its request by reducing the amount requested may do so after the service of such notice.

C. Prior to the first day of each Administrative Year, the Water Rights Panel shall determine if sufficient water has been offered to satisfy all requests. If it determines that sufficient water has not been offered, it shall reduce such requests pro rata in the proportion that each request bears to the total of all requests.

D. Not later than the first day of each Administrative Year, the Water Rights Panel 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, it 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 therefore.

7. Allocation of Exchange Pool Water by Water Rights Panel

A. In allocating water which has been offered for release to the Exchange Pool under Section VI.1, the Water Rights Panel shall first allocate that water required to be offered for release and which is offered at the lowest price, 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 Section VI.6, the Water Rights Panel 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 Section VI 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.

B. Each Party requesting the release of water for its use and to whom released water is allocated from the Exchange Pool may thereafter, subject to all of the provisions of this Amended 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 Administrative Year for which the allocation is made.

8. Exchange Pool Water Pumped Before Pumper's Own Right

From and after the first day of each Administrative 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 it shall have been taken, and no such Party shall be deemed to have extracted from the Basin any water under its 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.

9. Price and Payment for Water Released for Exchange Pool

A. All Parties allocated water under Section VI.6 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.

B. Each Party shall pay to the Water Rights Panel, in five equal monthly installments during the applicable Administrative Year, an amount equal to the quantity of water allocated to it multiplied by said uniform price. The Water Rights Panel 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 Administrative Year involved, and payment therefore shall be made to the Water Rights Panel 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 one percent (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 Water Rights Panel or by any Party hereto for the benefit of the Water Rights Panel.

C. Promptly upon receipt of such payment, the Water Rights Panel 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 WRD DURING PERIODS OF EMERGENCY

A. WRD overlies the West Coast Basin and engages in activities of replenishing the groundwaters thereof with Replenishment Water. During an actual or threatened temporary shortage of the Imported Water supply to West Coast Basin, WRD 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 Over-Production Agreements with such Parties. Such Over-Production Agreements shall not exceed in the aggregate ten thousand (10,000) acre-fee (the "Initial Cumulative Over-Production Cap"). WRD may determine that a quantity of water is available for such agreements that exceed the Initial Cumulative Over-Production Cap (the "Supplemental Over-Production Water") based on a determination made after a public hearing and taking into account the water levels in the Basin and the availability of water to replenish the Basin other than Imported Water. Over-Production Agreements for Supplemental Over-Production Water shall be made available on an equal basis to all Parties with an Adjudicated Right who (i) possess no Carryover or Stored Water, (ii) have purchased Imported Water in the immediately preceding Administrative Year or will receive less water from a Water Purveyor due to the declared drought curtailing that Water Purveyor's available supplies, (iii) have exercised or contractually agreed to not exercise its rights under Section V.14 of this Amended Judgment, and (iv) provide important goods and services to the general public, provided, however, that WRD shall give priority to Parties meeting those criteria who have not entered into an Over-Production Agreement for an portion of the Initial Cumulative

Over-Production Cap. Over-Production Agreements for Supplemental Over-Production Water shall be on the same terms as required under Sections VII.D and E.

B. Notwithstanding any other provision of this Amended Judgment, any Party with Adjudicated Rights who is (i) Water Purveyors, (ii) possess no Carryover or Stored Water, and (iii) have exercised or contractually agreed to not exercise its rights under Section V.14 of this Amended Judgment, is authorized to enter into agreements with WRD under which such Water Purveyors may exceed their Adjudicated Rights for a particular Administrative Year (an "Over-Production Agreement") when the following conditions are met:

(1) WRD is in receipt of a resolution of the Board of Directors of 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 service area, which will be alleviated in part by over-pumping from West Coast Basin.

(2) The Board of Directors of both WRD and the Water Rights Panel, by resolutions, concur in the resolution of MWD's Board of Directors and each determine that the temporary overproduction in West Coast Basin will not adversely affect the integrity of the Basin or the sea water barrier maintained along the coast of the West Coast Basin. In said resolution, WRD'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 all Parties. Said notice shall be mailed at least ten (10) days before said scheduled hearing date. At said public hearing, Parties shall be given full opportunity to be heard, and at the conclusion thereof the Board of Directors of WRD by resolution (a "Drought Resolution") decides to proceed with agreements under this Section VII.

C. If WRD has not entered into Over-Production Agreements with Water Purveyors for the entirety of the Initial Cumulative Over-Production Cap within thirty (30) days after the Drought Resolution, then WRD may enter into Over-Production Agreements with other Parties to this Judgment, although the amount of said Agreements shall not cause an exceedance of the Initial Cumulative Over-Production Cap. In considering such Agreements with other

Parties, WRD shall accord priority to Parties who provide important goods and services to the general public.

D. All Over-Production Agreements with WRD shall be subject to the following requirements, and such reasonable others as WRD's Board of Directors shall require:

(1) The Over-Production Agreements 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) The Over-Production Agreements shall be offered to Water Purveyors and Parties, excepting those which WRD'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 Coast Basin wherein groundwater levels are at an elevation where over-pumping is, under all the circumstances, undesirable.

(3) The maximum term of any such Over-Production Agreement shall be four (4) months. All such Over-Production 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 Amended Judgment.

(4) The Over-Production Agreements shall contain provisions that the Water Purveyor or Party executing the agreement pay to WRD a price, in addition to the applicable Replenishment Assessment, determined on the following formula: The price per acre-foot of West Basin Municipal Water District's treated domestic and municipal water for the Administrative 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 WRD's Board of Directors; and (b) the rate of the replenishment assessment of WRD for the same Administrative Year. If the term of the Over-Production Agreement is for a period which will be partially in one Administrative Year and partially in another, and a change in either or both the price per acre-foot of West Basin Municipal Water District's treated domestic and municipal water and rate of the replenishment assessment of WRD 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 Over-Production 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 Over-Production Agreement are the last water pumped in the Administrative Year, and shall be payable as the Over-Production Agreement shall provide.

(5) The Over-Production Agreements shall contain provisions that: (a) All of such agreements (but not less than all) shall be subject to termination by WRD if, in the judgment of WRD'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 WRD's Board of Directors finds that Material Physical Harm has developed as a result of over-extractions by any Water Purveyor or Party which have executed said Over-Production Agreements, or for any other reason that WRD's Board of Directors find good and sufficient.

E. Other matters applicable to such Over-Production Agreements and over-pumping thereunder are as follows, and to the extent they would affect obligations of the WRD they shall be anticipated in said Over-Production Agreements:

(1) The quantity of over-pumping permitted shall be additional to that which the Water Purveyor or Party could otherwise over-pump under this Amended Judgment.

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

(3) Only one four-month period may be utilized by WRD in entering into such Over-Production Agreements, as to any one emergency or continuation thereof declared by MWD's Board of Directors under Section VII.B(2) hereof.

(4) If any Party claims that it is being damaged or threatened with

damage by the over-extractions by any Party to such an Over-Production Agreement, the Water Rights Panel or any Party hereto may seek appropriate action of the Court for termination of any such Over-Production Agreement upon notice of hearing served on all Parties. Any such termination shall not affect the obligation of the Party having entered into an Over-Production Agreement pursuant to this Section to make payments under the Over-Production Agreement for over-extractions which previously occurred thereunder.

(5) WRD shall maintain separate accounting and a separate fund of the proceeds from payments made pursuant to agreements entered into under this Section. Said fund shall be utilized solely for purposes of replenishment and the replacement of waters in West Coast Basin. WRD shall, as soon as practicable, cause replenishment in West Coast Basin by the amounts to be over-extracted pursuant to this Section, whether through spreading, injection, or in-lieu agreements.

(6) Over-extractions made pursuant to the said Over-Production Agreements shall not be subject to the "make up" provisions provided in Section V.14, provided, that if any Party fails to make payments as required by the Over-Production Agreement, Water Rights Panel may require such "make up" under Section V.14.

(7) The Water Purveyor or Party under any such Over-Production Agreement may, and is encouraged to, enter into appropriate arrangements with customers who have Adjudicated Rights in West Coast Basin under or pursuant to this Amended Judgment, whereby the Water Purveyor or Party will be assisted in meeting the objectives of the agreement.

(8) Nothing in this Section VII limits the exercise of the reserved and continuing jurisdiction of the court as provided in Sections XII and XIII hereof.

VIII. INJUNCTION

Upon entry of this Amended Judgment, 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 otherwise provided in this Amended Judgment. Consistent with the Order Amending Judgment to Provide Exclusion Zone, dated December 21, 1995, no person shall construct, operate or maintain a well for the production of groundwater within 2,000 feet of any seawater barrier injection well operated in connection with the West Coast Basin Seawater Barrier Project.

IX. LIMITATIONS UPON EXTRACTION; ORDER OF PRODUCTION

1. Limits on Extractions

The total extraction right for an Administrative Year includes a Party's Total Adjudicated Production Right (to the extent not transferred by agreement or otherwise), and any right to extract Stored Water or Carryover as provided in this Amended Judgment. Any Party who has Carryover and/or Stored Water in the aggregate amount equal to or exceeding twenty percent (20%) of the Party's Total Adjudicated Production Right shall be allowed to extract, in any one Administrative Year, up to one-hundred and twenty percent (120%) of the Party's Total Adjudicated Production Right, except upon prior approval by the Storage Panel, as provided herein. Upon application, the Storage Panel shall approve a Party's request to extract water in excess of one hundred and twenty percent (120%) of such limitation consistent with Section V.13.B. Requests to extract water in excess of one hundred and twenty percent (120%) of a Party's Total Adjudicated Production Right shall be reviewed and either approved or denied by the Storage Panel in accordance with the procedure set forth in Section V.13 of this Amended Judgment.

2. Prioritization of Production

Except as provided in Section V.6.D, unless a Party elects otherwise, 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: (i) Exchange Pool production; (ii) production of Carryover Water (but excluding the Carryover Water described in Section V.4.C, (iii) production of water pursuant to a lease or other agreement of an Adjudicated Right; (iv) production of water pursuant to that Party's Adjudicated Right; (v) production of Stored Water; (vi) the production of the Carryover Water described in Section V.4.C; and (vi) emergency production pursuant to an Over-Production Agreement with WRD pursuant to Section VII.

X. LOSS OF DECREED RIGHTS

A. 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.

B. No taking of water under Sections 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 its 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 its 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 Amended 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 its successor in interest, or to the public generally, or to any Party thereof, otherwise than as provided herein.

XI. WATERMASTER

1. Appointment

A. The constituent bodies specified below are, jointly, hereby appointed Watermaster to administer this Amended Judgment, for an indefinite term, but subject to removal by the Court. Collectively such bodies, which together shall constitute the "Watermaster," shall have restricted powers, duties and responsibilities as specified herein, it being the Court's intention that particular constituent bodies of the Watermaster have only limited and specified powers over certain aspects of the administration of this Amended Judgment.

B. The Outgoing Watermaster has agreed to exercise reasonable diligence in the complete transition of Watermaster duties and responsibilities within a reasonable time following entry of this order, and to make available to the new Watermaster all records concerning Watermaster activities.

C. Watermaster, and each of its constituent bodies, as designated below, exist as a special master pursuant to this Amended Judgment and serve at the pleasure of the Court. Nothing herein shall be construed as creating an independent designation of "Watermaster" as a public agency subject to the provisions of CEQA.

D. Chair of the Water Rights Panel (defined below) shall represent the Watermaster before the Court subject to the provisions of Sections XI.2(B)(1) of this Amended Judgment.

E. The Administrative Body and the Water Rights Panel, acting jointly as the Watermaster, shall adopt Watermaster Rules that are reasonably necessary to carry out this Amended Judgment and are consistent with this Amended Judgment. Said Rules shall also include provisions for the appropriate application of existing laws to actions by the Watermaster concerning conflicts of interests; limiting gifts and monies to individuals holding a position on or in any constituent body of Watermaster; hiring outside contractors and consultants; and use of fees and assessments paid to the Watermaster authorized under this Amended Judgment. Within ninety (90) days after entry of this Amended Judgment, the Watermaster shall issue draft Watermaster Rules. The Watermaster Rules and any subsequent amendments shall be subject to a 30 day review and comment period by the Adjudicated Rights holders. The Watermaster is required to respond to all comments received during the 30 day review and comment period within a reasonable amount of time. Thereafter, the Watermaster is required to hold a hearing on the final Watermaster Rules or any amendments before submittal to the Court for review. The Watermaster Rules, and any subsequent amendments thereto, shall be presented to the Court for review and approval upon a noticed motion in the manner set forth in Section XI.4.D herein.

2. Watermaster Constituents

A. <u>Administrative Body</u>

WRD is appointed the Administrative Body of the West Coast Basin Watermaster ("Administrative Body"). In order to assist the Court in the administration and enforcement of the provisions of this Amended Judgment and to keep the Court fully advised, the Administrative

Body shall have the following duties, powers and responsibilities in addition to those before or hereafter provided in this Judgment.

(1) *Require Reports, Information and Records*

In consultation with the Water Rights Panel, the Administrative Body shall require the Parties to furnish such reports, information and records as may be reasonably necessary to determine compliance or lack of compliance by any Party with the provisions of this Amended Judgment. The Administrative Body shall collect and assemble the records and other data required of the Parties hereto, and evaluate such records and other data as part of its duties herein. The Water Rights Panel shall make its records available to the Administrative Body for record-keeping. The Administrative Body shall maintain copies of all records prepared or received by each body of the Watermaster consistent with the Watermaster Rules. Subject to compliance with all applicable laws protecting the disclosure of a party's confidential or proprietary information, the Administrative Body shall allow any Party or its representative to inspect and copy the Watermaster's records and other data during normal business hours and in accordance with the rules and regulations promulgated by the Watermaster hereafter.

(2) *Notices by Watermaster*

The Administrative Body shall provide notice to all Parties of all material actions or determinations by the Watermaster or any constituent body thereof, which shall be defined or delineated in the Watermaster Rules, and as otherwise provided by this Amended Judgment. The Administrative Body shall set a regular meeting day per month where it can hold a meeting and is required to post the agenda and give notice per the Watermaster Rules. The Watermaster Rules shall identify the days of the month on which the Storage Panel shall hold noticed meetings when a meeting is necessary. If notice is required to be given per email, then the timing for the notice is 5 business days. If the notice is required to be given per U.S. mail, then the timing for the notice is 10 business days. No action or determination of the Watermaster or the constituent bodies thereof shall be valid unless the notice requirements are satisfied.

(3) *Annual Groundwater Monitoring*

The Administrative Body shall undertake at least one annual groundwater modeling event to evaluate the current condition of the Basin and determine that cumulatively, all Existing Facilities and New Storage Facilities do not pose actual or an imminent threat of Material Physical Harm. Said groundwater modeling shall incorporate the results of modeling conducted by the Administrative Body in accordance with Section V.12 of this Amended Judgment for the Storage Panel's review. The Administrative Body shall provide the Parties notice of and access to the results of the annual groundwater modeling, which notice may be by delivery of the Watermaster's annual report.

(4) *Annual Report*

On or before October 15 of every year, the Administrative Body shall prepare and deliver an annual report for the consideration of the Water Rights Panel. On or before December 15 of every year, the Watermaster shall report to the Court on the Basin and, for that purpose, may adopt the report of the Administrative Body, or separately may make its own report. Each annual report to the Court shall include, but not be limited to, the following:

- All water extractions in the Basin, including that by producers who have no Adjudicated Right;
- Storage accounts maintained by each Party, including Carryover Conversion;
- Proposed and ongoing Water Augmentation Projects;
- Proposed and ongoing Storage Projects;
- Proposed and constructed New Storage Facilities;
- The results of groundwater modeling conducted by the Administrative Body consistent with Section V.12 of this Amended Judgment during the preceding year, which modeling shall including modeling necessary to assess the cumulative effect on water levels in the Basin;
- Exchange Pool operation;
- Use of Developed Water, including Imported Water;
- Violations of the Amended Judgment and corrective action taken by the bodies of the Watermaster having jurisdiction as provided in this Amended Judgment;

- Change of ownership of Adjudicated Rights;
- Watermaster administration costs;
- Water spread or injected into the Basin, including water injected for seawater intrusion barriers;
- Development of Material Physical Harm, or imminent threat of the development of Material Physical Harm; and
- Recommendations, if any.

(5) *Carryover Conversion Payment*

All payments of the Replenishment Assessment received by WRD from a Party converting Carryover to Stored Water shall be maintained and accounted for by WRD separate from any other funds held by WRD, either in its capacity as the Administrative Body or in its statutory capacity under the WRD Act. WRD shall use said Replenishment Assessments solely for the purpose of securing Replenishment Water for causing replenishment of the West Basin. WRD shall provide an accounting of the monies received, how spent, and, if not spent within an Administrative Year, the total amount maintained by WRD and the reason for not utilizing the funds for that Administrative Year.

(6) *Annual Budget and Appeal Procedure in Relation Thereto*

(a) At all times, the Administrative Body shall maintain a separation in accounting between the expense for performing the administrative functions specified in this Amended Judgment (the "Administrative Budget") and WRD's Replenishment Assessment and operating budget. By April 1 of each Administrative Year, the Administrative Body shall prepare a tentative Administrative Budget for the subsequent year. The Administrative Body shall mail a copy of said tentative Administrative Budget to each of the Parties at least sixty (60) days before the beginning of each Administrative Year. For the first Administrative Year of operation under this Amended Judgment, if the Administrative Body is unable to meet the above time requirement, the Administrative Body shall mail said copies as soon as possible. The Administrative Budget mailed to the Parties shall provide sufficient detail in the Administrative Budget to demonstrate a separation in accounting between the Administrative Budget and WRD's

Replenishment Assessment and operating budget.

(b) The first year that the Administrative Budget is prepared by the Administrative Body pursuant to this Amended Judgment, the amount of that budget shall not exceed an amount equal to fifty percent (50%) of the 2013-2014 charge for Watermaster service for the West Coast Basin collected from Parties by the Outgoing Watermaster (the "Base Budget Amount"). All increases in future budgets for the Administrative Body above the amount set forth above shall be subject to approval by the Water Rights Panel following a public meeting to be held prior to the beginning of the Administrative Year, provided that the approved budget shall not be less than the amount of the first-year budget for the Administrative Body, except upon further order of the Court. Any administrative function by WRD already paid for by the Replenishment Assessment shall not be added as an expense in the Administrative Budget. Any expense or cost attributable to performing the duties of the Administrative Body imposed by this Amended Judgment shall not be added to WRD's operating budget, or otherwise added to the calculation of the Replenishment Assessment. WRD, operating under the WRD Act, acknowledges that it has been preparing and maintaining financial statements and budgets in accordance with generally accepted accounting principles for state and local governments (GAAP) and conducting audits in accordance with generally accepted government auditing standards (GAGAS). In order to fulfill those budget and accounting provisions of the Amended Judgment relating to WRD acting in its statutory capacity, WRD agrees, acting under the WRD Act, to (i) continue its practice of preparing and maintaining financial statements and budgets in accordance with GAAP and conducting audits in accordance with GAGAS and (ii) certify, each year after an audit is completed within three (3) months after end of the Administrative Year, that no expense in WRD's operating budget or its Replenishment Assessment was charged or assessed contrary to the express provisions of Sections XI.2A5, 6 and 7 of the Amended Judgment. While WRD may approve the proposed Administrative Budget at the same meeting in which WRD adopts its annual Replenishment Assessment or annual budget, the Administrative Body's budget shall be separate and distinct from the Replenishment Assessment imposed pursuant to Water Code § 60317 and WRD's operating budget. If approval by the Water Rights Panel is required pursuant to the foregoing, the Water Rights Panel shall act upon the proposed budget within 15 calendar days after the public meeting. If the Water Rights Panel does not approve the budget prior to such deadline, the matter may be appealed to the Court within sixty (60) days.

(c) If any Party has any objection to the Administrative Budget, it shall present the same in writing to the Watermaster within fifteen (15) days after the date of mailing of said tentative budget by the Administrative Body. The Parties shall make the payments otherwise required of them to the Administrative Body even though an appeal of such budget may be pending. Upon any revision by the Court, the Administrative Body shall either remit to the Parties their pro rata portions of any reduction in the budget, or shall credit their accounts with respect to their budget assessments for the next ensuing Administrative Year, as the Court shall direct.

(d) The Administrative Body shall prepare and maintain financial statements and budgets in accordance with generally accepted accounting principles (GAAP) for state and local governments in order to meet this requirement. Audits will be conducted in accordance with generally accepted government auditing standards (GAGAS). The Administrative Body shall, each year after an audit is completed, certify within three (3) months after end of the Administrative Year that no expense was part of the budget or paid for by the budget contrary to the Amended Judgment.

(7) *Administrative Budget as Parties' Costs*

(a) The amount of the Administrative Budget to be assessed to each Party shall be determined as follows: If that portion of the final Administrative Budget to be assessed to the Parties holding an Adjudicated Right is equal to or less than twenty dollars ($20.00) per said Party then the cost shall be equally apportioned among said Parties. If that portion of the final Administrative Budget to be assessed to said Parties is greater than twenty dollars ($20.00) per said Party then each Party holding an Adjudicated Right shall be assessed a minimum of twenty dollars ($20.00), the amount of revenue expected to be received through the foregoing minimum assessments shall be deducted from that portion of the final Administrative Budget to be assessed to the Parties holding an Adjudicated Rights and the balance shall be assessed to the Parties having Adjudicated Rights, such balance being divided among them proportionately in accordance with their respective Adjudicated Rights. As a condition of approving a Regional Storage Project or a Water Augmentation Project, the Storage Panel shall require any Party participating in such a Project who does not hold an Adjudicated Right to pay a portion of the Administrative Body's budget consistent with the amount of water that can be stored by the Regional Storage Project relative to the total amount of Adjudicated Rights.

(b) Payment of the assessment provided for herein, subject to adjustment by the Court as provided, shall be made by each such Party prior to beginning of the Administrative Year to which the assessment relates, or within forty (40) days after the mailing of the tentative Administrative Budget, whichever is later. If such payment by any Party is not made on or before said date, the Administrative Body shall add a penalty of five percent (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 order hereinafter made by the Court, or by other proceedings by the Watermaster or by any Party hereto on the Watermaster's behalf.

(c) All such payments and penalties received by the Administrative Body shall be expended by it for the administration of this Amended Judgment. Any money remaining at the end of any Administrative Year shall be available for such use in the following Administrative Year. The Administrative Body shall maintain no reserves.

(8) *Concerns About Material Physical Harm*

Any Party shall raise concerns regarding actual or an imminent threat of Material Physical Harm to the Administrative Body or the Storage Panel prior to filing a motion with the Court unless the Party reasonably believes that irreparable harm to the Basin or itself is imminent if the Court does not order provisional relief. If reasonable concerns are raised to the Administrative Body, it shall promptly consider any such concerns including undertaking any investigation, modeling or other technical analysis necessary to address the concern. The Administrative Body shall provide written notice of its determination, and copy of its report, to all Parties by either electronic mail or U.S. postal mail. If a Party disagrees with the Administrative Body's conclusion, the Party may request a hearing before the Storage Panel. Any hearing before the

Storage Panel shall proceed as outlined in Section V.13.B. Any decision of the Storage Panel shall be reviewable by the Court in accordance with Section XI.4.

(9) *Other Administrative Body Duties*

The Administrative Body shall perform such other duties as directed by the Court and the Watermaster Rules.

B. The Water Rights Panel

The Water Rights Panel shall consist of five (5) members from among representatives of the Parties holding Adjudicated Rights under this Amended Judgment. Three (3) of the members shall be the elected officers of president, vice-president and treasurer of the West Basin Water Association and the remaining two (2) members shall be selected by the Board of Directors of the West Basin Water Association. At least one (1) member of the Water Rights Panel shall be a non-Water Purveyor Adjudicated Rights holder possessing at least 1% of the Adjudicated Rights in the Basin. Members of the Water Rights Panel shall serve without compensation. The Water Rights Panel shall take action by majority of its members. The Water Rights Panel shall have the following duties and responsibilities:

(1) *Judicial Action Concerning Adjudicated Rights and Stored Water*

As among the other bodies of the Watermaster, the Water Rights Panel shall (i) have exclusive authority to move the Court to take such action as may be necessary to enforce the terms of the Amended Judgment, including but not limited to matters involving the extraction and maintenance of Adjudicated Rights, provided, however, that in matters involving Stored Water, the Water Rights Panel and the WRD Board of Directors must concur in the decision to take judicial action, in which case the Chair of the Water Rights Panel shall represent the Storage Panel in such action. If the WRD Board of Directors does not concur in taking judicial action, any Party may file a motion with the Court concerning the matter in their status as Parties to the Judgment if permitted by Section XIII of this Amended Judgment. No Party to the Amended Judgment waives any rights to seek relief or review of the decisions of the Watermaster or any body thereof. The Water Rights Panel's retention of legal counsel shall comply with the Watermaster Rules.

(2) *Requirement of Measuring Devices*

The Water Rights Panel shall require all parties owning or operating any facilities for the extraction of groundwater from West Basin to install and maintain at all times in good working order at such party's own expense, appropriate measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(3) *Inspections by Watermaster*

Subject to compliance with all applicable laws protecting the disclosure of a party's confidential or proprietary information, the Water Rights Panel may make inspections of groundwater production facilities, including aquifer storage and recovery facilities, and measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(4) *Reports*

The Water Rights Panel shall be responsible for reporting to the Court concerning Adjudicated Rights in the Basin, including any and all of the following:

- Groundwater extractions;
- Exchange Pool operation;
- Violations of this Amended Judgment and corrective action taken or sought;
- Change of ownership of an Adjudicated Right;
- Assessments made by the Water Rights Panel and any costs incurred;
- Development of Material Physical Harm, or imminent threat of the development of Material Physical Harm; and
- Recommendations, if any.

(5) *Assessment*

The Water Rights Panel shall assess holders of Adjudicated Rights within the West Coast Basin an annual amount not to exceed one dollar ($1.00) per acre-foot of Adjudicated Rights, by majority vote of the members of the Water Rights Panel. The Water Rights Panel may assess a higher amount, subject to being overruled by Majority Protest. If an assessment is assessed in excess of one dollar ($1.00) per acre-foot, the assessment shall only be applied for that

Administrative Year. The assessment is intended to cover any costs associated with any Amended Judgment enforcement action, the reporting to the Court pursuant to Section XI.2.B(1), and the review of Storage Projects as a component of the Storage Panel, as provided herein. It is anticipated that this body will rely on the Administrative Body's staff for most functions, but the Water Rights Panel may engage its own staff if required in its reasonable judgment and in accordance with the Watermaster Rules. The Water Rights Panel shall prepare and maintain financial statements and budgets in accordance with generally accepted accounting principles (GAAP) for state and local governments in order to meet this requirement. Every other year, the Water Rights Panel shall cause a Review of its Financial Statements by a certified public accountant. The Water Rights Panel shall, each year after a review is completed, certify within three (3) months after end of the Administrative Year that no expense was part of the budget or paid for by the budget contrary to the Amended Judgment. As a condition of approving a Regional Storage Project or a Water Augmentation Project, the Storage Panel will require any Party participating in such a Project who does not hold an Adjudicated Right to pay a reasonable portion of the Water Rights Panel's budget consistent with the amount of water that can be stored by the Regional Storage Project relative to the total amount of Adjudicated Rights.

(6) *Notices*

The Water Rights Panel shall, to the extent practical, hold regular meetings on a quarterly basis or more often as needed. Notices of meetings of the Water Rights Panel shall be provided as required under Section XI.2.A(2).

C. The Storage Panel

The Storage Panel of the Watermaster shall be a bicameral body consisting of (i) the West Coast Basin Water Rights Panel and (ii) the Board of Directors of WRD. Action by the Storage Panel shall require separate action by each of its constituent bodies provided, however, that action can be taken by each constituent body at a joint hearing. The Storage Panel shall have the duties and responsibilities specified with regard to the provisions for the storage and extraction of Stored Water as set forth in Section V and elsewhere within this Amended Judgment.

D. Capacity As Court-Appointed Watermaster

In performing any duty not required by any other law or regulation, specifically set forth within this Amended Judgment and in conformance with all requirements for said duty therein for the Administrative Body, the Water Rights Panel or the Storage Panel then those bodies shall be deemed to act solely as the Court's appointed Watermaster and not in any other capacity.

3. Limitations on Powers and Duties of the Watermaster and its Constituent Bodies

A. Use of Facilities and Data Collected by Other Governmental Agencies

Where practicable, the three bodies constituting the Watermaster should not duplicate the collection of data relative to conditions of the West Coast Basin which is then being collected by one or more governmental agencies, but where necessary each constituent body of the Watermaster may collect supplemental data. Where it appears more economical to do so, the Watermaster and its constituent bodies are directed to use such facilities of other governmental agencies as are available to it at either no cost or cost agreements with respect to the data collection, receipt of reports, billings to Parties, mailings to Parties, and similar matters.

B. Limitations on WRD's Leasing Authority

WRD shall not engage in a lease of Adjudicated Rights, Stored Water or any other water within the Basin to or from any Party or third party, provided, however, that the foregoing prohibition shall (i) not apply during any emergency declared pursuant to Section VII of this Judgment, (ii) not be interpreted to restrict WRD's ability or authority to lease in water from any source or entity for purposes of replenishment of the Basin or for water quality activities, and (iii) not apply to any reclaimed, recycled or remediated water that may be developed by WRD pursuant to its replenishment authority under WRD's enabling act (California Water Code Section 60000 *et seq.*).

C. Wasted and Nonchargeable Production Authorized By Watermaster

(1) In the event there is a rapid increase in the salinity of water produced from a well within the Basin and the Party producing the water has reason to believe that such increased salinity is the result of or potentially relates to sea water intrusion into the

Basin, a Party may petition the Administrative Body, acting on behalf of the Watermaster, for its consent to make various changes in the operation of said well and waste the production therefrom during such changed conditions, in an effort to identify the reason for the rapid increase in salinity of the water produced from such well and to attempt to discover a method of operation for said well which will decrease the salinity of the water produced therefrom to such an extent that the well may be used in the future as part of the potable water supply of said Party.

(2) Upon receipt of such petition, the Administrative Body shall consult with the Los Angeles County Flood Control District and may consult with others, as needed, to determine whether such increased salinity in the water produced from said well potentially relates to sea water intrusion into the Basin. After such consultation, should the Administrative Body determine that the higher saline water produced from said well potentially relates to sea water intrusion, the Administrative Body may issue a written approval that authorizes the production and waste of water from said well in a manner which seeks to analyze and find a method of well operation for correction of the increased salinity of the water produced therefrom (a "Salinity Pumping Approval"). Such authorized water production and the waste thereof shall not be charged to the production right of such producing Party and shall be exempt from WRD's Replenishment Assessment.

(3) Regardless of the number of applications therefor, the Administrative Body may authorize a maximum aggregate of 100 acre feet per fiscal year of pumping and water wasting activities authorized under Salinity Pumping Approvals.

(4) If, during such authorized water production and waste thereof, such produced water becomes potable or is used by such producer, the Administrative Body shall immediately issue an order terminating the Salinity Pumping Approval.

(5) The results of all such Salinity Pumping Approvals shall be made available to any party herein upon request therefor to the Watermaster.

D. Material Physical Harm

The Storage Panel shall consider any reasonable concern that a Storage Project, Water Augmentation Project or New Storage Facility either individually or cumulatively is causing or is reasonably likely to cause an imminent threat of Material Physical Harm made pursuant to a report or request for hearing received pursuant to Section XI.2.A(8) of this Amended Judgment. The Storage Panel shall act on that matter in accordance with Section V,13(B) of this Amended Judgment. Any Party objecting to the Storage Panel's decision may file a motion with the Court pursuant to Section XI.4.D of this Amended Judgment.

4. Appeal from Watermaster Decisions Other Than With Respect to Budget

A. The provisions of this Section shall not apply to budgetary matters, as to which the appellate procedure is provided in Section XI.2.A(6).

B. Any Party who objects to any rule, determination, order or finding made by the Watermaster, or any constituent body of the Watermaster, may, but is not required to, object in writing delivered to the Administrative Body within thirty (30) days after the date the constituent body of Watermaster mails written notice of the making of such rule, determination, order or finding.

C. Within thirty (30) days after such delivery, the Watermaster, or the affected constituent body thereof, shall consider said objection and shall amend or affirm the ruling, determination, order or finding and shall give notice thereof to all Parties.

D. Within sixty (60) days from the date of said notice of a final ruling, determination, order or finding of a constituent body of the Watermaster, any objecting Party may file with the Court its objection to such final rule, determination, order or finding, and may bring the same on for hearing before the Court at such time as the Court may direct, after first having served said objection upon all other Parties. The Court may affirm, modify, amend or overrule any such rule, determination, order or finding. Any factual determinations made by the Watermaster or any constituent body thereof, shall be reviewed by the Court based on substantial evidence in light of the whole record, and any questions of law shall be reviewed de novo.

E. Any objection under this paragraph shall not stay the rule, determination, order or finding of a constituent body of the Watermaster. However, the Court, by ex parte order, may provide for a stay thereof on application of any interested Party on or after the date that any such Party delivers to the pertinent constituent body of the Watermaster any written objection.

XII. 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 or any other right under this Amended Judgment to extract groundwater 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.

XIII. JUDGMENT MODIFICATIONS AND FURTHER ORDERS OF COURT

A. The Court further reserves jurisdiction so that at any 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 Amended 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.

B. This Amended Judgment does not determine nor affect the determination of whether WRD's adoption of a Replenishment Assessment complied with applicable laws in the event that any Replenishment Assessment is challenged in a legal action.

XIV. RESERVATION OF RIGHTS

All Parties retain all rights not specifically determined herein, including any right, by common law or otherwise, to seek compensation for damages arising out of any act or omission of any person. WRD retains any rights, powers or privileges that it may now have or may hereafter have by reason of provision of law, including but not limited to the WRD Act, provided that WRD shall perform any express duty or obligation specifically imposed on it, either in its capacity as the Administrative Body or its statutory capacity, by this Amended Judgment. Further, this Amended Judgment shall not excuse any Party from complying with any applicable law, regulation or order.

XV. DESIGNEES OF PARTIES FOR FUTURE NOTICE AND SERVICE

A. 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.

B. 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 its 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.

C. 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.

D. 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 Amended 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.

E. 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 Coast 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 Coast 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.

XVI. 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 or store and produce water from the Basin may seek to intervene in this Amended Judgment in accordance with applicable law, including, but not limited to, the California Code of Civil Procedure, or through a Stipulation for Intervention entered into with the Water Rights Panel. The Water Rights Panel 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 Amended Judgment and entitled to the rights and privileges accorded under the physical solution imposed herein.

XVII. JUDGMENT BINDING ON SUCCESSORS

Subject to the specific provisions hereinbefore contained, this Amended Judgment and all provisions thereof are applicable to, binding upon and inure to the benefit of not only the Parties, 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.

THE CLERK WILL ENTER THIS AMENDED JUDGMENT FORTHWITH.

DATED: DEC 0 5 2014

KENNETH R. FREEMAN

Judge of the Superior Court

Central Basin - Judgement 786656

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CITY OF LONG BEACH

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Superior Court of California
County of Los Angeles

DEC 23 2013

Sherri R. Carter, Executive Officer/Clerk
By Marisela Fregoso, Deputy

SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF LOS ANGELES

CENTRAL AND WEST BASIN WATER REPLENISHMENT DISTRICT, etc.,

Plaintiff,

vs.

CHARLES E. ADAMS, et al.,

Defendant

CITY OF LAKEWOOD, a municipal corporation,

Cross-Complainant

vs.

CHARLES E. ADAMS, et al.,

Cross-Defendants.

Case No.: 786,656

THIRD AMENDED JUDGMENT

(Declaring and establishing
water rights in Central Basin,
enjoining extractions
therefrom in excess of
specified quantities
and providing for the storage and
extraction of stored water.)

Assigned for all purposes to
Hon. Abraham Khan
Dept. 51

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The original judgment in this action was entered on or about August 27, 1965. 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 for this action is currently assigned to Hon. Abraham Khan.

The Motion of Plaintiff WATER REPLENISHMENT DISTRICT OF SOUTHERN CALIFORNIA (which originally brought this action under its former name "Central and West Basin Water Replenishment District"), and of defendants, City of Lakewood, City of Long Beach, Golden State Water Company, California Water Service Company, City of Los Angeles, City of Cerritos, City of Downey, City of Signal Hill, Pico Water District, Bellflower-Somerset Mutual Water Company, LaHabra Heights County Water District, City of Norwalk, Orchard Dale Water District, Montebello Land & Water Company, South Montebello Irrigation District, Sativa Los Angeles County Water District, City of Vernon and Central Basin Municipal Water District ("Moving Parties") herein 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 51 of the above-entitled court on December 18, 2013 at 9:00 a.m. before said Hon. Abraham Khan. This "Third 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, 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 entered in this action as amended to date, including this Third Amended Judgment.

There exists in the County of Los Angeles, State of California, an underground water basin or reservoir known and hereinafter referred to as the "Central Basin" or "Basin" described in Appendix "1" to this Judgment.

Within this Judgment, the following terms, words, phrases and clauses are used by the Court with the following meanings:

"Adjudicated Storage Capacity" means 220,000 acre-feet of the Available Dewatered

Space which has been apportioned herein for Individual Storage Accounts and Community Storage.

"Administrative Body" is defined in Section II(A).

"Administrative Year" means the twelve (12) month period beginning July 1 and ending June 30.

"Allowed Pumping Allocation" is that quantity in acre feet which the Court adjudges to be the maximum quantity which a party should be allowed to extract annually from Central Basin as set forth in Part I hereof, which constitutes 80% of such party's Total Water Right.

"Allowed Pumping Allocation for a particular Administrative Year" and "Allowed Pumping Allocation in the following Administrative Year" and similar clauses, mean the Allowed Pumping Allocation as increased in a particular Administrative Year by any authorized carryovers pursuant to Section III(A) of this Judgment and as reduced by reason of any over-extractions in a previous Administrative Year.

"Artificial Replenishment" is the replenishment of Central Basin achieved through the spreading or injection of imported or recycled water for percolation thereof into Central Basin by a governmental agency, including WRD.

"Artificial Replenishment Water" means water captured or procured by WRD to replenish the Basin, either directly by percolating or injecting the water into the Basin, or through in lieu replenishment by substituting surface water (or payment therefor) in lieu of production and use of groundwater.

"Available Dewatered Space" means the total amount of space available to hold groundwater within the Central Basin without causing Material Physical Harm, which space is allocated between Adjudicated Storage Capacity and Basin Operating Reserve.

"Base Water Right" is the highest continuous extractions of water by a party from Central Basin for a beneficial use in any period of five consecutive years after the commencement of overdraft in Central Basin and prior to the commencement of this action, as to which there has been no cessation of use by that party during any subsequent period of five consecutive years. As employed in the above definition, the words "extractions of water by a party" and "cessation of use by that party" include such extractions and cessations by any predecessor or predecessors in interest.

"Basin Operating Reserve" means a total of 110,000 acre feet of Available Dewatered Space available for Basin operations as provided in Section IV(L). The Basin Operating Reserve added to the Adjudicated Storage Capacity equals the amount of Available Dewatered Space.

"Calendar Year" is the twelve month period commencing January 1 of each year and ending December 31 of each year.

"Carryover" is defined in Section III(A).

"Carryover Conversion" means the process of transferring water properly held as Carryover into Stored Water, or the water so converted to Stored Water.

"Central Basin" is the underground basin or reservoir underlying the Central Basin Area, the exterior boundaries of which Central Basin are the same as the exterior boundaries of Central Basin Area.

"Central Basin Area" is the territory described in Appendix "1" to this Judgment and is a segment of the territory comprising Plaintiff District.

"Central Basin Water Rights Panel" means the constituent body of Watermaster consisting of seven (7) Parties elected from among parties holding Allowed Pumping Allocations as provided in Section II(B).

"CEQA" refers to the California Environmental Quality Act, Public Resources Code §§ 21000 *et seq*.

"Community Storage Pool" is defined in Section IV(E).

"Declared Water Emergency" means a period commencing with the adoption of a resolution of the Board of Directors of WRD declaring that conditions within the Central Basin relating to natural and imported supplies of water are such that, without implementation of the water emergency provisions of this Judgment, the water resources of the Central Basin risk degradation. Such Declaration may be made as provided in Section III(A)(3).

"Disadvantaged Community" means any area that is served by a Water Purveyor and that consists of one or more contiguous census tracts which, based upon the most-recent United

States Census data, demonstrates a median household income which is less than eighty percent (80%) of the median household income for all Census Tracts within the state of California. The identification of Disadvantaged Communities shall be made by Watermaster following each decennial census.

"Extraction," "extractions," "extracting," "extracted," and other variations of the same noun and verb, mean pumping, taking, diverting or withdrawing groundwater by any manner or means whatsoever from Central Basin.

"Imported Water" means water brought into Central Basin Area from a non-tributary source by a party and any predecessors in interest, either through purchase directly from Metropolitan Water District of Southern California ("MWD"), the Central Basin Municipal Water District ("CBMWD"), or any other MWD member agency and additionally, as to the Department of Water and Power of the City of Los Angeles, water brought into the Central Basin Area by that party by means of the Owens River Aqueduct. In the case of water imported for storage by a party pursuant to this Judgment, "Imported Water" means water brought into the Central Basin from any non-tributary source as one method for establishing storage in the Central Basin.

"Imported Water Use Credit" is the annual amount, computed on a calendar year basis, of Imported Water which any party and any predecessors in interest, who have timely made the required filings under Water Code Section 1005.1, have imported into Central Basin Area in any calendar year and subsequent to July 9, 1951, for beneficial use therein, but not exceeding the amount by which that party and any predecessors in interest reduces his or their extractions of groundwater from Central Basin in that calendar year from the level of his or their extractions in the preceding calendar year, or in any prior calendar year not earlier than the calendar year 1950, whichever is the greater.

"Individual Storage Allocation" is defined in Section IV(D).

"Majority Protest" means a written protest filed with the Administrative Body of Watermaster within sixty (60) days following a protested event or decision, which evidences the concurrence of a majority of the Allowed Pumping Allocations held within the Basin as of the date thereof.

"Material Physical Harm" means material physical injury or a material diminution in the quality or quantity of groundwater available within the Basin to support extraction of Total Water Rights or Stored Water, that is demonstrated to be attributable to the placement, recharge, injection, storage or recapture of Stored Water in the Central Basin, including, but not limited to, degradation of water quality, liquefaction, land subsidence and other material physical injury caused by elevated or lowered groundwater levels. Material Physical Harm does not include "economic injury" that results from other than direct physical causes, including any adverse effect on water rates, lease rates, or demand for water. Once fully mitigated, physical injury shall no longer be considered to be material.

"Natural Replenishment" means and includes all processes other than "Artificial Replenishment" by which water may become a part of the groundwater supply of Central Basin.

"Natural Safe Yield" is the maximum quantity of groundwater, not in excess of the long term average annual quantity of Natural Replenishment, which may be extracted annually from Central Basin without eventual depletion thereof or without otherwise causing eventual permanent damage to Central Basin as a source of groundwater for beneficial use, said maximum quantity being determined without reference to Artificial Replenishment.

"Outgoing Watermaster" is the State of California, Department of Water Resources, the Watermaster appointed pursuant to the terms of the Judgment before this Third Amendment.

"Overdraft" is that condition of a groundwater basin resulting from extractions in any given annual period or periods in excess of the long term average annual quantity of Natural Replenishment, or in excess of that quantity which may be extracted annually without otherwise causing eventual permanent damage to the basin.

"Party" means a party to this action. Whenever the term "party" is used in connection with a quantitative water right, or any quantitative right, privilege or obligation, or in connection with the assessment for the budget of the Watermaster, it shall be deemed to refer collectively to those parties to whom are attributed a Total Water Right in Part I of this Judgment.

"Person" or "persons" include individuals, partnerships, associations, governmental agencies and corporations, and any and all types of entities.

"Recycled Water" means water that has been reclaimed through treatment appropriate for its intended use in compliance with applicable regulations.

"Regional Disadvantaged Communities Incentive Program" means a program to be developed by Watermaster in the manner provided in Section II(H) of this Judgment, and approved by the Court, whereby a portion of the Community Storage Pool is made available to or for the benefit of Disadvantaged Communities, on a priority basis within the Central Basin.

"Replenishment Assessment" means the replenishment assessment imposed by WRD upon each acre-foot of groundwater extracted from the Central Basin pursuant to WRD's enabling act, California Water Code §§ 60000 et seq.

"Small Water Producers Group" means a body consisting of parties holding no greater than 5,000 acre-feet of Allowed Pumping Allocation, as set forth on Appendix 3 hereto and as may be modified from time to time by the Group's own procedures and the requirements set forth in Appendix 3.

"Storage Panel" or "Central Basin Storage Panel" means a bicameral constituent body of Watermaster consisting of (i) the Central Basin Water Rights Panel and (ii) the Board of Directors of WRD.

"Storage Project" means an activity pertaining to the placement, recharge, injection, storage, transfer, or recapture of Stored Water within the Basin, but does not include actions by WRD undertaken in connection with its replenishment activities.

"Stored Water" means water, including Recycled Water, held within Available Dewatered Space as a result of spreading, injection, in-lieu delivery, or Carryover Conversion, where there is an intention to subsequently withdraw the water for reasonable and beneficial use pursuant to this Judgment.

"Total Water Right" is the quantity arrived at in the same manner as in the computation of "Base Water Right," but including as if extracted in any particular year the Imported Water Use Credit, if any, to which a particular party may be entitled.

"Water" includes only non-saline water, which is that having less than 1,000 parts of chlorides to 1,000,000 parts of water.

"Water Augmentation Project" means pre-approved physical actions and management activities that provide demonstrated appreciable increases in long-term annual groundwater yield in the Basin that are initiated as provided in this Judgment after January 1, 2013.

"Water Purveyor" means a Party (and successors in interest) which sells water to the public, whether a regulated public utility, mutual water company or public entity. As that term is used in Section III(B)(6), "Water Purveyor," in addition to the foregoing, means a Party which has a connection or connections for the taking of Imported Water through the Metropolitan Water District of Southern California ("MWD"), or through a MWD-member agency, 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.

"Watermaster" is defined in Part II and is comprised of (i) the Administrative Body, (ii) the Central Basin Water Rights Panel, and (iii) the Central Basin Storage Panel. Watermaster, and the various constituent bodies of Watermaster, as designated in this Judgment, exist as a special master pursuant to this Judgment and Watermaster serves at the pleasure of the Court. Nothing herein shall be construed as creating an independent designation of "Watermaster" as a public agency subject to the provisions of CEQA, nor does membership or participation as the designated Watermaster expand any statutory, constitutional, or other powers of the members serving as part of the Watermaster.

"West Coast Basin" is the groundwater basin adjacent to the Central Basin which is the subject of a separate adjudication of groundwater rights in *California Water Service Company, et al. v. City of Compton, et al.*, Los Angeles Superior Court Case No. 506806.

"WRD" or "Water Replenishment District" is the plaintiff herein, the Water Replenishment District of Southern California, a special district of the State of California, which brought this action under its former name, "Central and West Basin Water Replenishment District."

In those instances where any of the above-defined words, terms, phrases or clauses are utilized in the definition of any of the other above-defined words, terms, phrases and clauses, such use is with the same meaning as is above set forth.

NOW THEREFORE, IT IS ORDERED, DECLARED, ADJUDGED AND DECREED WITH RESPECT TO THE ACTION AND CROSS-ACTION AS FOLLOWS:

I. DECLARATION AND DETERMINATION OF WATER RIGHTS OF PARTIES; RESTRICTION ON THE EXERCISE THEREOF.[1]

A. Determination of Rights of Parties.

(1) Each party, except defendants The City of Los Angeles and Department of Water and Power of the City of Los Angeles, whose name is set forth in Appendix 2 and by this reference made a part hereof, and after whose name there appears under the column "Total Water Right" a figure other than "0," is the owner of and has the right to extract annually groundwater from Central Basin for beneficial use in the quantity set forth after that party's name under said column "Total Water Right" as of the close of the Administrative Year ending June 30, 2012 in accordance with the Watermaster Reports on file with this Court and the records of the Plaintiff. This tabulation does not take into account additions or subtractions from any Allowed Pumping Allocation of a producer for the 2012-2013 Administrative Year, nor other adjustments not representing change in fee title to water rights, such as leases of water rights, nor does it include the names of lessees of landowners where the lessees are exercising the water rights. The exercise of all water rights is subject, however, to the provisions of this Judgment as hereinafter contained. All of said rights are of the same legal force and effect and are without priority with reference to each other. Each party whose name is set forth in the tabulation in Appendix "2" of this

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[1] Headings in the Judgment are for purposes of reference and the language of said headings do not constitute, other than for such purpose, a portion of this Judgment.

Judgment, and after whose name there appears under the column "Total Water Right" the figure "0," owns no rights to extract any groundwater from Central Basin, and has no right to extract any groundwater from Central Basin.

(2) Defendant The City of Los Angeles is the owner of the right to extract fifteen thousand (15,000) acre feet per annum of groundwater from Central Basin, but it has the right and ability to purchase or lease additional rights to extract groundwater and increase its Allowed Pumping Allocation. Defendant Department of Water and Power of the City of Los Angeles has no right to extract groundwater from Central Basin except insofar as it has the right, power, duty or obligation on behalf of defendant The City of Los Angeles to exercise the water rights in Central Basin of defendant The City of Los Angeles. The exercise of said rights is subject, however, to the provisions of this Judgment hereafter contained, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet (and any increase in its Allowed Pumping Allocation) bears to the Allowed Pumping Allocations of the other parties.

(3) No party to this action is the owner of or has any right to extract groundwater from Central Basin except as herein affirmatively determined.

B. <u>Parties Enjoined as to Quantities of Extractions</u>.

(1) Each party, other than The State of California and The City of Los Angeles and Department of Water and Power of The City of Los Angeles, is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting from Central Basin any quantity of Water greater than the party's Allowed Pumping Allocation as hereinafter set forth next to the name of the party in the tabulation appearing in Appendix 2 at the end of this Judgment, subject to further provisions of this Judgment. Subject to such further provisions, the officials, agents and employees of The State of

California are enjoined and restrained in any such Administrative Year from extracting from Central Basin collectively any quantity of water greater than the Allowed Pumping Allocation of The State of California as hereinafter set forth next to the name of that party in the same tabulation. Each party adjudged and declared above not to be the owner of and not to have the right to extract groundwater from Central Basin is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting any groundwater from Central Basin, except as may be hereinafter permitted to any such party under this Judgment.

(2) The total extraction right for each party includes a party's Allowed Pumping Allocation (to the extent not transferred by agreement or otherwise), any contractual right acquired through lease or other agreement to extract or use the rights of another party, and any right to extract Stored Water or Carryover as provided in this Judgment. No party may extract in excess of 140% of the sum of (i) the party's Allowed Pumping Allocation and (ii) the party's leased water, except upon prior approval by the applicable body of Watermaster as required pursuant to Section IV(J)as provided herein. Upon application, the body specified in Section IV(J) shall approve a party's request to extract water in excess of such limit, provided there is no Material Physical Harm. Requests to extract water in excess of such limit shall be reviewed and either approved or denied within thirty (30) days of such request.

(3) Defendant The City of Los Angeles is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting from Central Basin any quantity of water greater than fifteen thousand (15,000) acre feet or its Allowed Pumping Allocation, as recognized by the Watermaster, if it acquires additional rights to pump groundwater through purchase or lease, subject to further provisions of this Judgment, including but not limited to, sharing with other parties in any subsequent decreases or increases in

the quantity of extractions permitted from Central Basin by parties, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet (or the adjusted Allowed Pumping Allocation if additional rights are acquired) bears to the Allowed Pumping Allocations of the other parties. Defendant Department of Water and Power of The City of Los Angeles is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting from Central Basin any quantity of water other than such as it may extract on behalf of defendant The City of Los Angeles, and which extractions, along with any extractions by said City, shall not exceed that quantity permitted by this Judgment to that City in any Administrative Year. Whenever in this Judgment the term "Allowed Pumping Allocation" appears, it shall be deemed to mean as to defendant The City of Los Angeles the quantity of fifteen thousand (15,000) acre feet unless the City of Los Angeles has acquired through purchase or lease right to extract additional groundwater. The limit on extraction as provided in the preceding Section I(B)(1) shall also apply to The City of Los Angeles.

(4) 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 Watermaster.

(5) Unless a party elects otherwise, production of water from the Basin for the use or benefit of the parties hereto shall be counted against the party's total extraction right in the following order: (i) Increased extractions by certain qualified water rights holders pursuant to Section IV(K), (ii) Exchange Pool production, (iii) production of Carryover water, (iv) production of leased water, , (v) production of Allowed Pumping Allocation, (vi) production of Stored Water, (vii) production of Drought Carryover (according to Watermaster's Rules), and (viii) production of water under an agreement with WRD during a period of

emergency pursuant to Section III(B)(6).

C. Parties Enjoined as to Export of Extractions.

Except as expressly authorized herein, or upon further order of the Court, all parties are enjoined and restrained from transporting water extracted from the Central Basin outside the boundaries of the Central Basin Area. For purposes of this Section, water supplied by a Water Purveyor to its customers located within any of its service areas contiguous to the Central Basin or within WRD's service area shall be exempt from the export prohibition of this Section provided that the Water Purveyor also provides water to a service area that overlies the Basin in whole or in part. The foregoing exemption is not made, nor is it related to, a determination of an underflow between the basins, a cost or benefit allocation, or any other factor relating to the allocation of the Replenishment Assessment by WRD. Further, this injunction and restriction does not apply to export of water that will take place pursuant to contractual obligations specifically identified on Appendix 4, nor does it apply to export of Stored Water not having its origin in Carryover Conversion. The export identified on Appendix 4 may continue to the extent that any such extraction does not violate any other provisions of this Judgment, provided however that no such export identified on Appendix 4 shall exceed 5,000 acre-feet in any Year.

II. APPOINTMENT OF WATERMASTER; WATERMASTER ADMINISTRATION PROVISIONS.

The particular bodies specified below are, jointly, hereby appointed Watermaster, for an indefinite term, but subject to removal by the Court, to administer this Judgment. Such bodies, which together shall constitute the "Watermaster," shall have restricted powers, duties and responsibilities as specified herein, it being the court's intention that particular constituent bodies of Watermaster have only limited and specified powers over certain aspects of the administration of this Judgment. The Outgoing Watermaster will exercise reasonable diligence in the complete transition of Watermaster duties and responsibilities within a reasonable time following entry of this order, and to make available to the new Watermaster all records concerning Watermaster activities. The chair of the Central Basin Water Rights Panel (defined below) shall thereafter represent the Watermaster before the Court.

A. The Administrative Body.

Plaintiff Water Replenishment District of Southern California ("WRD") is appointed the Administrative Body of the Central Basin Watermaster ("Administrative Body"). In order to assist the Court in the administration of the provisions of this Judgment and to keep the Water Rights Panel and the Court fully advised in the premises, the Administrative Body shall have the following duties, powers and responsibilities:

(1) To Require Reports, Information and Records.

In consultation with the Water Rights Panel, the Administrative Body shall require the parties to furnish such reports, information and records as may be reasonably necessary to determine compliance or lack of compliance by any party with the provisions of this Judgment.

(2) Storage Projects.

The Administrative Body shall exercise such powers as may be specifically granted to it under this Judgment with regard to Stored Water.

(3) Annual Report.

The Administrative Body shall prepare, on or before the 15th day of the fourth month following the end of the preceding Administrative Year, an annual report for the consideration of the Water Rights Panel. The Chair of the Water Rights Panel shall submit to the Court either (1) the annual report prepared by the Administrative Body, following the adoption by the Water Rights Panel, or (2) an annual report separately prepared and adopted by the Water Rights Panel. The annual report prepared by the Administrative Body shall be limited to the following, unless otherwise required by the Court:

(a) Groundwater extractions

(b) Storage Accounts maintained by each party

(c) Status of the Regional Disadvantaged Community Incentive Program, if approved by the Court

(d) Exchange Pool operation

(e) Use of Imported Water

(f) Violations of this Judgment and corrective action taken by bodies of Watermaster having jurisdiction as provided in this Judgment

(g) Change of ownership of Total Water Rights

(h) Watermaster administration costs

(i) Water spread or imported into the Basin

(j) Water Augmentation Projects

(k) Whether the Administrative Body has become aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, as required pursuant to Section IV(B) of this Judgment

(l) Other matters as agreed with the Water Rights Panel

(m) Recommendations, if any.

In consultation with the Water Rights Panel, the Administrative Body shall provide reasonable notice to all parties of all material actions or determinations by Watermaster or any constituent body thereof, and as otherwise provided by this Third Amended Judgment.

(4) <u>Annual Budget and Appeal Procedure in Relation Thereto</u>.

By April 1 of each Administrative Year, the Administrative Body shall prepare a proposed administrative budget for the subsequent year stating the anticipated expense for performing the administrative functions specified in this Judgment (the "Administrative Budget"). The Administrative Body shall mail a copy of the proposed Administrative Budget to each of the Parties at least 60 days before the beginning of each Administrative Year. The Administrative Budget mailed to the Parties shall provide sufficient detail in the Administrative Budget to demonstrate a separation in accounting between the Administrative Budget and WRD's Replenishment Assessment and operating budget. For the first Administrative Year of operation under this Third Amended Judgment, if the Administrative Body is unable to meet the above time requirement, the Administrative Body shall mail said copies as soon as possible. The first year the Administrative Budget is prepared, the amount of that budget shall not exceed an amount equal to fifty percent (50%) of the 2012-2013 charge for Watermaster service for the Central Basin collected from Parties by the California Department of Water Resources. At all times, the Administrative Body shall maintain a separation in accounting between the Administrative Budget and WRD's Replenishment Assessment and operating budget. All increases in future budgets for the Administrative Body above the amount set forth above shall be subject to approval by the Water Rights Panel following a public meeting to be held prior to the beginning of the Administrative Year, provided that the approved budget shall not be less than the amount of the first-year budget for the Administrative Body, except upon further order of the Court. Any administrative function by WRD already paid for by the Replenishment Assessment shall not be added as an expense in the Administrative Budget. Similarly, any expense paid for by the Administrative Budget shall not be added to WRD's operating budget, or otherwise added to the calculation of the Replenishment Assessment. While WRD may approve the proposed Administrative Budget at the same meeting in which WRD adopts its annual Replenishment Assessment or annual budget, the Administrative Body's budget shall be separate and distinct from the Replenishment Assessment imposed pursuant to Water Code §60317 and WRD's operating budget.

If approval by the Water Rights Panel is required pursuant to the foregoing, the Water Rights Panel shall act upon the proposed budget within 15 calendar days after the public meeting. If the Water Rights Panel does not approve the budget prior to such deadline, the matter may be appealed to the Court within sixty (60) days. If any Party hereto has any objection to the Administrative Budget, it shall present the same in writing to Watermaster within 15 days after the date of mailing of said tentative budget by the Administrative Body. The Parties shall make the payments otherwise required of them to the Administrative Body even though an appeal of such budget may be pending. Upon any revision by the Court, the Administrative Body shall either remit to the Parties their pro rata portions of any reduction in the budget, or shall credit their accounts with respect to their budget assessments for the next ensuing Administrative Year, as the Court shall direct.

The amount of the Administrative Budget to be assessed to each party shall be determined as follows: If that portion of the final budget to be assessed to the Parties is equal to or less than $20.00 per party then the cost shall be equally apportioned among the Parties. If that portion of the final budget to be assessed to Parties is greater than $20.00 per party then each Party shall be assessed a minimum of $20.00. The amount of revenue expected to be received through the foregoing minimum assessments shall be deducted from that portion of the final budget to be assessed to the Parties and the balance shall be assessed to the Parties having Allowed Pumping Allocation, such balance being divided among them proportionately in accordance with their respective Allowed Pumping Allocation.

Payment of the assessment provided for herein, subject to adjustment by the Court as provided, shall be made by each such party prior to beginning of the Administrative Year to which the assessment relates, or within 40 days after the mailing of the tentative budget, whichever is later. If such payment by any Party is not made on or before said date, the Administrative Body 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 order hereinafter made by the Court, or by other proceedings by the Watermaster or by any Party on the Watermaster's behalf.

Any money unexpended at the end of any Administrative Year shall be applied to the budget of the next succeeding Administrative Year. The Administrative Body shall maintain no reserves.

Notwithstanding the above, no part of the budget of the Administrative Body shall be assessed to WRD or to any Party who has not extracted water from Central Basin for a period of two successive Administrative Years prior to the Administrative Year in which the tentative budget should be mailed by the Administrative Body under the provisions of this subparagraph (4).

(5) Rules.

The Administrative Body may adopt, and amend from time to time, rules consistent with this Judgment as may be reasonably necessary to carry out duties under the provisions of this Judgment within its particular area of responsibility. The Body shall adopt its first set of rules and procedures within three (3) months following entry of this Third Amended Judgment. The rules shall be effective on such date after the mailing thereof to the Parties as is specified by the Body, but not sooner than thirty (30) days after such mailing.

B. The Central Basin Water Rights Panel.

The Central Basin Water Rights Panel of the Central Basin Watermaster ("Water Rights Panel") shall consist of seven (7) members, each of which is a Party. The term of each member of the Panel, with the exception of the seat held by the Small Water Producers Group, as provided herein, shall be limited to four years. The Court will make the initial appointments to the Central Basin Water Rights Panel upon motion by Parties consistent with the categories set forth below at or about the time of entry of this Third Amended Judgment, and shall establish a procedure for the staggered terms of such members. Thereafter, elections of members of the Panel shall be held as provided herein. One (1) such member of the Water Rights Panel shall be elected by vote of the Small Water Producers Group conducted in accordance with its own procedures, provided such Group, as of the date of the election, consists of at least five (5) members who are Water Purveyors. One (1) such member of the Water Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of less than 5,000 acre-feet who are not members of the Small Water Producers Group or, if the Small Water Producers Group does not then qualify following a continuous six-month period of non-qualification as provided herein, then two (2) such members shall be so selected. One (1) such member of the Water Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of at least 5,000 acre-feet but less than 10,000 acre-feet. Three (3) such members of the Water Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of 10,000 acre-feet or greater. One (1) such member of the Water Rights Panel shall be elected by a vote of all holders of Allowed Pumping Allocations, with each such holder being entitled to one vote, such member to be elected by a plurality of the votes cast, following a nomination procedure to be established in the Water Rights Panel's rules. In the event of a tie, the seventh member shall be determined as may be provided in the Water Rights Panel's rules, or otherwise by the court. Except as otherwise provided in this Section, each such rights holder shall have the right to cast a total number of votes equal to the number of acre-feet of its Allowed Pumping Allocation (rounded to the next highest whole number). With the exception of voting for the seventh member, Parties shall be entitled to vote only for candidates within the category(ies) that represent that Party's Allowed Pumping Allocation. For example, parties who are members of the Small Water Producers Group are entitled to vote only for the Small Water Producer Group member and the seventh member of the Water Rights Panel, and so on. Parties are not permitted to split votes. The results of such election shall be reported to the Court for confirmation of each member's appointment to the Water Rights Panel of Watermaster. The elected members of the Water Rights Panel shall be those candidates receiving the highest vote total in their respective categories. The Water Rights Panel shall hold its first meeting within thirty (30) days of the date this Third Amended Judgment becomes final. The Water Rights Panel shall develop rules for its operation consistent with this Judgment. The Water Rights Panel shall take action, including the election of its Chair, by majority vote of its members. Election of the Chair shall occur every two years, with no Party serving as Chair for consecutive-terms. Members of the Water Rights Panel shall serve without compensation. All references to Annual Pumping Allocation, as used herein, are as determined by the last published Watermaster report.

(1) The Water Rights Panel shall have the following duties and responsibilities:

(a) Enforcement of Adjudicated Rights. As against the other bodies of Watermaster, the Water Rights Panel shall have exclusive authority to move the Court to take such action as may be necessary to enforce the terms of the Judgment with regard to the extraction of Allowed Pumping Allocation and the maintenance of adjudicated groundwater extraction rights as provided in this Judgment.

(b) Requirement of Measuring Devices. The Water Rights Panel shall require all parties owning or operating any facilities for the extraction of groundwater from Central Basin to install and maintain at all times in good working order at such party's own expense, appropriate measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(c) Inspections by Watermaster. The Water Rights Panel may make inspections of groundwater production facilities, including aquifer storage and recovery facilities, and measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(d) Reports. Annually, the Water Rights Panel, in cooperation with the Administrative Body, shall report to the Court, concerning any or all of the following:

(i) Groundwater extractions

(ii) Exchange Pool operation

(iii) Status of the Regional Disadvantaged Community Incentive Program, if approved by the Court

(iv) Violations of this Judgment and corrective action taken or sought

(v) Change of ownership of Total Water Rights

(vi) Assessments made by the Water Rights Panel and any costs incurred

(vii) Whether the Water Rights Panel has become aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, as required pursuant to Section IV(B) of this Judgment

(viii) Recommendations, if any.

As provided in Section II.A(3), the Water Rights Panel may adopt the annual report prepared by the Administrative Body, and submit the same to the Court, or the Water Rights Panel may prepare, adopt and submit to the Court a separate report. The Chair of the Water Rights Panel shall be responsible for reporting to the Court concerning adjudicated water rights issues in the Basin.

(2) Assessment. The Water Rights Panel shall assess holders of water rights within the Central Basin an annual amount not to exceed $1.00 per acre-foot of Allowed Pumping Allocation, by majority vote of the members of the Water Rights Panel. The body may assess a higher amount, subject to being overruled by Majority Protest. The assessment is intended to cover any costs associated with reporting responsibilities, any Judgment enforcement action, and the review of storage projects as a component of the "Storage Panel" as provided below. It is anticipated that this body will rely on the Administrative Body's staff for the functions related to the Administrative Body's responsibilities, but the

Water Rights Panel may engage its own staff if required in its reasonable judgment. Assessments will constitute a lien on the water right assessed, enforceable as provided in this Judgment.

(3) Rules. The Water Rights Panel may adopt and amend from time to time, at an open meeting of that Panel, rules consistent with this Judgment as may be reasonably necessary to carry out duties under the provisions of this Judgment within its particular area of responsibility. The Panel shall adopt its first set of rules and procedures within three (3) months following entry of this Third Amended Judgment. The rules shall be effective on such date after the mailing thereof to the Parties as is specified by the Panel, but not sooner than thirty (30) days after such mailing.

C. The Storage Panel.

The Storage Panel of the Central Basin Watermaster ("Storage Panel") shall be a bicameral body consisting of (i) the Water Rights Panel and (ii) the Board of Directors of WRD. Action by the Storage Panel shall require separate action by a majority of each of its constituent bodies. The Storage Panel shall have the duties and responsibilities specified with regard to the Provisions for the Storage and Extraction of Stored Groundwater as set forth in Part IV and the other provisions of this Judgment.

D. Use of Facilities and Data Collected by Other Governmental Agencies.

Where practicable, the three bodies constituting the Central Basin Watermaster should not duplicate the collection of data relative to conditions of the Central Basin which is then being collected by one or more governmental agencies, but where necessary each such body may collect supplemental data. Where it appears more economical to do so, the Watermaster and its constituent bodies are directed to use such facilities of other governmental agencies as are available to it under either no cost or cost agreements with respect to the receipt of reports, billings to parties, mailings to parties, and similar matters.

E. Appeal from Watermaster Decisions.

Appeals concerning the budget proposed by the Administrative Body shall be governed by Section II(A)(4) of this Judgment. Appeals concerning decisions by the Storage Panel shall be governed by Section IV(P) of this Judgment. With respect to all other objections by a Party to any action or decision by the Watermaster, such objections will be governed by this Section II(E). Any party interested therein who objects to any rule, determination, order or finding made by the Watermaster or any constituent body thereof, may object thereto in writing delivered to the Administrative Body within 30 days after the date the Watermaster, or any constituent body thereof, mails written notice of the making of such rule, determination, order or finding. Within 30 days after such delivery the Watermaster, or the affected constituent body thereof, shall consider said objection and shall amend or affirm his rule, determination, order or finding and shall give notice thereof to all parties. Any such party may file with the Court within 60 days from the date of said notice any objection to such rule, determination, order or finding of the Watermaster, or any constituent body thereof, 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 all other parties. The Court may affirm, modify, amend or overrule any such rule, determination, order or finding of the Watermaster or its affected constituent body. Any objection under this paragraph shall not stay the rule, determination, order or finding of the Watermaster. However, the Court, by *ex parte* order, may provide for a stay thereof on application of any interested party on or after the date that any such party delivers to the Watermaster any written objection.

F. Effect of Non-Compliance by Watermaster With Time Provisions.

Failure of the Watermaster to perform any duty, power or responsibility set forth in this Judgment within the time limitation herein set forth shall not deprive the Watermaster or its applicable constituent body of authority to subsequently discharge such duty, power or responsibility, except to the extent that any such failure by the Watermaster may have rendered some otherwise required act by a party impossible.

G. Limitations on Administrative Body.

WRD shall not acquire Central Basin water rights, nor lease Central Basin water or water rights to or from any Party or third party. However, the foregoing shall (i) not be interpreted to restrict WRD's ability or authority to acquire water from any source for purposes of Artificial or Natural Replenishment or for water quality activities, and (ii) not restrict WRD's authority under California Water Code Section 60000 et seq. to develop reclaimed, recycled or remediated water for groundwater replenishment activities.

H. Regional Disadvantaged Communities Incentive Program.

The Water Rights Panel, acting through the General Manager of WRD, shall develop a Regional Disadvantaged Communities Incentive Program, pursuant to which a portion of the Community Storage Pool is reserved for the benefit of Disadvantaged Communities within the Central Basin. Nothing in this Judgment, nor the establishment of such a program, shall diminish the rights otherwise granted to Parties under this Judgment, including but not limited to the right to place water in storage in the Community Storage Pool. The Water Rights Panel shall meet within thirty (30) days of its formation to identify and consider potential third-party independent consultants who may be retained to design the program, including those recommended by the General Manager of WRD. The Water Rights Panel shall select a consultant within thirty (30) days thereafter. In the event the General Manager of WRD objects to the selected consultant, in writing, then the Water Rights Panel and the General Manager of WRD shall exchange a list of no more than two (2) consultants each for further consideration. If the Water Rights Panel and the General Manager of WRD are unable to agree to a consultant within an additional thirty (30) days, then the Chair of the Water Rights Panel shall file a request with the Court for an order appointing a consultant. Upon selection of a third-party independent consultant, whether through the Water Rights Panel process or the court process identified herein, the consultant shall design a detailed program and deliver it to the Water Rights Panel within ninety (90) days of the consultant's retention. All costs associated with design of the program shall be paid for out of the Water Rights

Panel's assessment, as provided in Section II.B(2). The Water Rights Panel shall present the program to the Court for its review and approval within one year of entry of this Third Amended Judgment. If approved by the Court, the Water Rights Panel, acting through the General Manager of WRD, shall be responsible for administration of the Regional Disadvantaged Communities Incentive Program, including insuring that any funds generated through the program benefit Disadvantaged Communities. Any Storage Project established pursuant to this Program shall have priority to use up to 23,000 acre-feet of Available Storage within the Community Storage Pool, as further provided in Section IV.E(2). Watermaster shall report to the Court concerning such program as a part of its annual report.

III. <u>PROVISIONS FOR PHYSICAL SOLUTION TO MEET THE WATER REQUIREMENTS IN CENTRAL BASIN</u>.

In order to provide flexibility to the injunction set forth in Part I of the Judgment, and to assist in a physical solution to meet water requirements in Central Basin, the injunction so set forth is subject to the following provisions.

A. <u>Carryover of Portion of Allowed Pumping Allocation</u>.

(1) <u>Amount of Carryover</u>.

Each party adjudged to have a Total Water Right or water rights and who, during a particular Administrative Year, does not extract from Central Basin a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative Year, less any allocated subscriptions by such party to the Exchange Pool, or plus any allocated requests by such party for purchase of Exchange Pool water, is permitted to carry over (the "One Year Carryover") from such Administrative Year the right to extract from Central Basin in the next succeeding Administrative Year so much of said total quantity as it did not extract in the particular Administrative Year, not to exceed (i) the Applicable Percentage of such party's Allowed Pumping Allocation for the particular Administrative

Year, or 20 acre-feet, whichever of said percentage or 20 acre-feet is the larger, less (ii) the total quantity of water then held in that party's combined Individual and Community Storage accounts, as hereinafter defined, but in no event less than 20% of the party's Allowed Pumping Allocation for the particular Administrative Year. For purposes of this Section, the "Applicable Percentage" shall be as follows for the years indicated:

For the Administrative Year in which this Third Amended Judgment becomes final:	30%
For the next Administrative Year:	40%
For the next Administrative Year:	50%
For the next Administrative Year and years following:	60%

(2) <u>Conversion of Carryover to Stored Water</u>.

A party having Carryover may, from time to time, elect to convert all or part of such party's Carryover to Stored Water as authorized herein ("Carryover Conversion") upon payment of the Replenishment Assessment to WRD. Such Stored Water shall be assigned to that party's Individual Storage Allocation, if available, and otherwise to the Community Storage Pool.

(3) <u>Declared Water Emergency</u>.

The Board of Directors of WRD may, from time to time, declare a water emergency upon a determination that conditions within the Central Basin relating to natural and imported water supplies are such that, without implementation of the Declared Water Emergency provisions of this subsection, the water resources of the Central Basin risk degradation. In making such declaration, the Board of Directors shall consider any information and requests provided by water producers, purveyors and other affected entities and shall, for that purpose, hold a public hearing in advance of such declaration. A Declared Water Emergency shall extend to the end of the Administrative Year during which such resolution is adopted, unless sooner ended by similar resolution.

(4) Drought Carryover.

Following the declaration of a Declared Water Emergency and until the Declared Water Emergency ends either by expiration or by resolution of the Board of Directors of WRD, each party adjudged to have a Total Water Right or water rights and who, during a particular Administrative Year, does not extract from Central Basin a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative Year, less any allocated subscriptions by such party to the Exchange Pool, or plus any allocated requests by such party for purchase of Exchange Pool water, is permitted to carry over (the "Drought Carryover") from such Administrative Year the right to extract from Central Basin so much of said total quantity as it did not extract during the period of the Declared Water Emergency, to the extent such quantity exceeds the One Year Carryover, not to exceed an additional 35% of such party's Allowed Pumping Allocation, or additional 35 acre feet, whichever of said 35% or 35 acre feet is the larger, less the amount of such party's Stored Water. Carryover amounts shall first be allocated to the One Year Carryover and any remaining carryover amount for that year shall be allocated to the Drought Carryover.

(5) Accumulated Drought Carryover.

No further amounts shall be added to the Drought Carryover following the end of the Declared Water Emergency, provided however that in the event another Declared Water Emergency is declared, additional Drought Carryover may be added, to the extent such additional Drought Carryover would not cause the total Drought Carryover to exceed the limits set forth above. The Drought Carryover shall be supplemental to and shall not affect any previous drought carryover acquired by a party pursuant to previous order of the court.

B. When Over-Extractions May be Permitted.

(1) Underestimation of Requirements for Water.

Any party hereto without Stored Water, having an Allowed Pumping Allocation, and not in violation of any provision of this Judgment may extract in an Administrative Year an additional quantity of water not to exceed: (a) 20% of such party's Allowed Pumping Allocation or 20 acre feet, whichever is greater, and (b) any amount in addition thereto which may be approved in advance by the Water Rights Panel of Watermaster.

(2) Reductions in Allowed Pumping Allocations in Succeeding Years to Compensate for Permissible Overextractions.

Any such party's Allowed Pumping Allocation for the following Administrative Year shall be reduced by the amount over-extracted pursuant to paragraph 1 above, provided that if the Water Rights Panel determines that such reduction in the party's Allowed Pumping Allocation in one Administrative Year will impose upon such a party an unreasonable hardship, the said reduction in said party's Allowed Pumping Allocation shall be prorated over a period of five (5) Administrative Years succeeding that in which the excessive extractions by the party occurred. Application for such relief to the Water Rights Panel must be made not later than the 40th day after the end of the Administrative Year in which such excessive pumping occurred. The Water Rights Panel shall grant such relief if such over-extraction, or any portion thereof, occurred during a period of Declared Water Emergency.

(3) Reductions in Allowed Pumping Allocations for the Next Succeeding Administrative Year to Compensate for Overpumping.

Whenever, pursuant to Section III(B)(1), a party over-extracts in excess of such party's Allowed Pumping Allocation plus that party's available One-Year Carryover and any Stored Water held by that party, and such excess has not been approved in advance by the Water Rights Panel, then such party's Allowed Pumping Allocation for the following Administrative Year shall be reduced by an amount equivalent to its total over-extractions in the particular Administrative Year in which it occurred.

(4) Reports of Certain Over-extractions to the Court.

Whenever a party over-extracts in excess of 20% of such party's Allowed Pumping Allocation for the particular Administrative Year plus that party's available One-Year Carryover and any Stored Water held by that party, without having obtained prior approval of the Water Rights Panel, such shall constitute a violation of the Judgment and the Water Rights Panel shall make a written report to the Court for such action as the Court may deem necessary. Such party shall be subject to such injunctive and other processes and action as the Court might otherwise take with regard to any other violation of such Judgment.

(5) Effect of Over-extractions on Rights.

Any party who over-extracts from Central Basin in any Administrative Year shall not acquire any additional rights by reason of such over-extractions; nor shall any required reductions in extractions during any subsequent years reduce the Total Water Right or water rights of any party to the extent said over-extractions are in compliance with paragraph 1 above.

(6) Pumping Under Agreement With Plaintiff During Periods of Emergency.

Plaintiff WRD overlies Central Basin and engages in activities of replenishing the groundwaters thereof. Plaintiff by resolution has appropriated for use during emergencies the quantity of 17,000 acre feet of imported and reclaimed water replenished by it into Central Basin, and pursuant to such resolution Plaintiff reserves the right to use or cause the use of such quantity during such emergency periods for the benefit of Water Purveyors.

(a) Notwithstanding any other provision of this Judgment, parties who are Water Purveyors (including successors in interest) are authorized to enter into agreements with Plaintiff for extraction of a portion of Plaintiff's 17,000 acre-feet of appropriated water, in excess of their respective Allowed Pumping Allocations for the particular Administrative Year when the following conditions are met:

(i) Plaintiff is in receipt of a resolution of the Board of Directors of the Metropolitan Water District of Southern California ("MWD") that 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 by overpumping from Central Basin.

(ii) The Board of Directors of both Plaintiff and Central Basin Municipal Water District by resolutions concur in the resolution of MWD's Board of Directors, and the Board of Directors of Plaintiff finds in its resolution that the average minimum elevation of water surface among those wells in the Montebello Forebay of the Central Basin designated as Los Angeles County Flood Control District Wells Nos. 1601T, 1564P, 1615P, and 1626L, is at least 43.7 feet above sea level. This computation shall be based upon the most recent "static readings" taken, which shall have been taken not more than four weeks prior. Should any of the wells designated above become destroyed or otherwise be in a condition so that readings cannot be made, or should the owner prevent their use for such readings, the Board of Directors of the Plaintiff may, upon appropriate engineering recommendation, substitute such other well or wells as it may deem appropriate.

(iii) In said resolution, Plaintiff's Board of Directors sets a public hearing, and notice of the time, place and date thereof (which may be continued from time to time without further notice) is given by First Class Mail to the current designees of the Parties, filed and served in accordance with Section VI(C) of this Judgment. Said notice shall be mailed at least five (5) days before the scheduled hearing date.

(iv) At said public hearing, parties (including successors in interest) are given full opportunity to be heard, and at the conclusion thereof the Board of Directors of Plaintiff by resolution decides to proceed with agreements under this Section III(B)(6).

(b) All such agreements shall be subject to the following requirements, and such others as Plaintiff's Board of Directors shall require:

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

(ii) They shall be offered to all Water Purveyors, excepting those which Plaintiff's Board of Directors determines should not overpump because such overpumping 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 Central Basin wherein groundwater levels are at an elevation where overpumping is under all the circumstances then undesirable.

(iii) The maximum terms for the agreements shall be four (4) months, which agreements shall commence on the same date and end on the same date (and which may be executed at any time within the four-month period), unless an extension thereof is authorized by the Court, under Part V of this Judgment.

(iv) They shall contain provisions requiring that the Water Purveyor executing the agreement pay to the Plaintiff a price in addition to the applicable replenishment assessment determined on the following formula. The normal price per acre-foot of Central Basin Municipal Water District's (CBMWD) treated domestic and municipal water, as "normal" price of such category of water is defined in Section III(C)(10) (price to be paid for Exchange Pool Water) as of the beginning of the contract term less the deductions set forth in said paragraph 10 for the Administrative Year in which the contract term commences. The agreement shall provide for adjustments in the first of said components for any proportional period of the contract term during which the CBMWD said normal price is changed, and if the agreement straddles two administrative years, the said deductions shall be adjusted for any proportionate period of the contract term in which the amount thereof or of either subcomponent changes for purposes of said paragraph 10. 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 of the last water pumped in the Administrative Year, and shall be payable as the agreement shall provide.

(v) They shall contain provisions that: (1) All of such agreements (but not less than all) shall be subject to termination by Plaintiff if, in the Judgment of Plaintiff'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 (2) that any individual agreement or agreements may be terminated if the Plaintiff's Board of Directors finds that adverse hydrologic circumstances have developed as a result of over extractions by any Water Purveyor(s) which have executed said agreements, or for any other reason that Plaintiff's Board of Directors finds good and sufficient.

(c) Other matters applicable to such agreements and overpumping thereunder are as follows, without need for express provisions in the agreements;

(i) The quantity of overpumping permitted shall be additional to that which the Water Purveyor could otherwise overpump under this Judgment.

(ii) The total quantity of permitted overpumping under all said agreements during said four months shall not exceed seventeen thousand (17,000) 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.

(iii) Only one four month period may be utilized by Plaintiff in entering into such agreements, as to any one emergency or continuation thereof declared by MWD's Board of Directors under Section III(B)(6)(a).

(iv) If any party claims it is being damaged or threatened with damage by the over extractions by any party to such an agreement, the first party or the Water Rights Panel may seek appropriate action of the Court for termination of any such agreement upon notice of hearing to the party complaining, to the party to said agreement, to the plaintiff, and to any parties who have filed a request for special notice. Any termination shall not affect the obligation of the party to make payments under the agreement for over extractions which did occur thereunder.

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

(vi) Over extractions pursuant to the agreements shall not be subject to the "make up" provisions of the Judgment as amended, provided that if any party fails to make payments as required by the agreement, Plaintiff may require such "make up" under Section III(B)(3) of this Judgment.

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

(7) <u>Exemption for Extractors of Contaminated Groundwater</u>.

Any party herein may petition WRD for a Non-consumptive Water Use Permit as part of a project to remedy or ameliorate groundwater contamination. If the petition is granted as set forth in this paragraph, the petitioner may extract the groundwater as permitted hereinafter, without the production counting against the petitioner's production rights.

(a) If the Board of WRD determines by Resolution that there is a problem of groundwater contamination that a proposed program will remedy or ameliorate, an operator may make extractions of groundwater to remedy or ameliorate that problem without the production counting against the petitioner's production rights if the water is not applied to beneficial surface use, its extractions are made in compliance with all the terms and conditions of the Board Resolution, and the Board has determined in the Resolution either of the following:

(i) The groundwater to be extracted is unusable and cannot be economically treated or blended for use with other water.

(ii) The proposed program involves extraction of usable water in the same quantity as will be returned to the underground without degradation of quality.

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

(c) Upon written notice to the operator involved, the Board may rescind or modify its Resolution. The rescission or modification of the Resolution shall apply to groundwater extractions occurring more than ten (10) days after the rescission or modification. Notice of rescission or modification shall be either mailed first class mail, postage prepaid, at least two weeks prior to the meeting of the Board at which the rescission or modification will be made to the address of record of the operator or personally delivered two weeks prior to the meeting.

(d) The Board'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 days of the notice thereof to the applicant and upon thirty days' notice to the designees of all parties herein.

(e) WRD shall monitor and periodically inspect the project for compliance with the terms and conditions for any permit issued pursuant to these provisions.

(f) No party shall recover costs from any other party herein in connection with determinations made with respect to this Part.

(8) <u>"Call" on Carryover Converted to Stored Water</u>.

Where any Party has elected, as permitted by Section III(A)(2), to convert Carryover to Stored Water, any other Party which has not, within the previous ten (10) years, been granted approval to extract Carryover Conversion under this

Section III(B)(8) more than five (5) times, may apply to the Storage Panel for the right to extract all or a portion of that Carryover Conversion in the year such Conversion occurs. The Storage Panel shall grant such request, providing there is no Material Physical Harm, if it determines that leased groundwater to meet the applicant's needs within the Basin cannot be obtained for less than forty-five percent (45%) of MWD's Imported Water rate for delivery of untreated water to the Central Basin spreading facilities (which rate is presently MWD's "Full Service Untreated Volumetric Cost, Tier 1"), and that the applicant will fully extract its Allowed Pumping Allocation, Carryover, and Stored Water, if any, in addition to its permitted overextraction under Section III(B)(1), prior to accessing such Carryover Conversion.

Upon such approval, the applicant may thereafter extract such water as provided herein. A Party so extracting groundwater shall fully restore such extracted water (either through under-extraction of its rights or through importing water) during the five-year period following the Year in which the extraction under this Section occurs. Otherwise, the extracting Party shall pay to the Watermaster an amount equal to 100% of MWD's Imported Water rate for purchase and delivery of untreated water to the Central Basin spreading facilities (which rate is presently MWD's "Full Service Untreated Volumetric Cost, Tier 1") whether or not such water is available that year, for the year during which is the fifth anniversary of the year during which such Carryover Conversion extraction occurs, multiplied by the amount of Carryover Conversion so extracted and not restored during such five-year period. Payment shall be made within thirty (30) days of demand by Watermaster. No Replenishment Assessment shall be due on Carryover Conversion so extracted. However, the Party must deposit with the Watermaster an amount equal to the Replenishment Assessment that would otherwise be imposed by WRD upon such extraction. If the party restores the water within the 5-year repayment period, then the Watermaster shall promptly return the deposit to the Party, without interest. If the Party does not restore the water within the 5-year repayment period, the deposit shall be credited towards the Party's obligation to pay 100% of MWD's Imported Water rate as required herein.

Should there be multiple requests to so extract Carryover Conversion in the same year, the Storage Panel shall allocate such extraction right such that each requesting party may extract a pro rata portion of the available Carryover Conversion for that year. No party may extract in excess of 2,500 acre feet of groundwater pursuant to this Section III(B)(8) in a single Year. Amounts paid to Watermaster hereunder shall be used by WRD solely for purchase of water for replenishment in the Basin. Watermaster, through the Storage Panel, shall give reasonable notice to the Parties of any application to so extract Carryover Conversion in such manner as the Storage Panel shall determine, including, without limitation, notice by electronic mail or by website posting, at least ten (10) days prior to consideration of any such application.

C. Exchange Pool Provisions.

(1) Definitions.

For purposes of these Exchange Pool provisions, the following words and terms have the following meanings:

(a) "Exchange Pool" is the arrangement hereinafter set forth whereby certain of the parties, ("Exchangees") may, notwithstanding the other provisions of the Judgment, extract additional water from Central Basin to meet their needs, and certain other of the parties ("Exchangors"), reduce their extractions below their Allowed Pumping Allocations in order to permit such additional extractions by others.

(b) "Exchangor" is one who offers, voluntarily or otherwise, pursuant to subsequent provisions, to reduce its extractions below its Allowed Pumping Allocation in order to permit such additional extractions by others.

(c) "Exchangee" is one who requests permission to extract additional water from Central Basin.

(d) "Undue hardship" means unusual and severe economic or operational hardship, other than that arising (i) by reason of any differential in quality that might exist between water extracted from Central Basin and water available for importation or (ii) by reason of any difference in cost to a party in subscribing to the Exchange Pool and reducing its extractions of water from Central Basin in an equivalent amount as opposed to extracting any such quantity itself.

(2) Parties Who May Purchase Water Through the Exchange Pool.

Any party not having existing facilities for the taking of imported water as of the beginning of any Administrative Year, and any party having such facilities as of the beginning of any Administrative Year who is unable, without undue hardship, to obtain, take, and put to beneficial use, through its distribution system or systems existing as of the beginning of the particular Administrative Year, imported water in a quantity which, when added to its Allowed Pumping Allocation for that particular Administrative Year, will meet its estimated needs for that particular Administrative Year, may purchase water from the Exchange Pool, subject to the limitations contained in this Section III(C) (Subpart "C" hereinafter).

(3) Procedure for Purchasing Exchange Pool Water.

Not later than the 40th day following the commencement of each Administrative Year, each such party desiring to purchase water from the Exchange Pool shall file with the Watermaster a request to so purchase, setting forth the amount of water in acre feet that such party estimates that it will require during the then current Administrative Year in excess of the total of:

(a) Its Allowed Pumping Allocation for that particular

Administrative Year; and

(b) The imported water, if any, which it estimates it will be able, without undue hardship, to obtain, take and put to beneficial use, through its distribution system or systems existing as of the beginning of that particular Administrative Year.

Any party who as of the beginning of any Administrative Year has existing facilities for the taking of imported water and who makes a request to purchase from the Exchange Pool must provide with such request substantiating data and other proof which, together with any further data and other proof requested by the Water Rights Panel, establishes that such party is unable without undue hardship, to obtain, take and put to beneficial use through its said distribution system or systems a sufficient quantity of imported water which, when added to its said Allowed Pumping Allocation for the particular Administrative Year, will meet its estimated needs. As to any such party, the Water Rights Panel shall make a determination whether the party has so established such inability, which determination shall be subject to review by the court under the procedure set forth in Part II of this Judgment. Any party making a request to purchase from the Exchange Pool shall either furnish such substantiating data and other proof, or a statement that such party had no existing facilities for the taking of imported water as of the beginning of that Administrative Year, and in either event a statement of the basis for the quantity requested to be purchased.

(4) <u>Subscriptions to Exchange Pool</u>.

(a) <u>Required Subscription</u>. Each party having existing facilities for the taking of imported water as of the beginning of any Administrative Year hereby subscribed to the Exchange Pool for purposes of meeting Category (a) requests thereon, as more particularly defined in paragraph 5 of this Subpart C, twenty percent

(20%) of its Allowed Pumping Allocation, or the quantity of imported water which it is able, without undue hardship, to obtain, take and put to beneficial use through its distribution system or systems existing as of the beginning of the particular Administrative Year in addition to such party's own estimated needs for imported water during that Administrative Year, whichever is the lesser. A party's subscription under this subparagraph (a) and subparagraph (b) of this paragraph 4 is sometimes hereinafter referred to as a "required subscription."

(b) Report to Watermaster Water Rights Panel by Parties with Connections and Unable to Subscribe 20%. Any party having existing facilities for the taking of imported water and estimating that it will be unable, without undue hardship, in that Administrative Year to obtain, take and put to beneficial use through its distribution system or systems existing as of the beginning of that Administrative Year, sufficient imported water to further reduce its extractions from the Central Basin by twenty percent (20%) of its Allowed Pumping Allocation for purposes of providing water to the Exchange Pool must furnish not later than the 40th day following the commencement of such Administrative Year substantiating data and other proof which, together with any further data and other proof requested by the Water Rights Panel, establishes said inability or such party shall be deemed to have subscribed twenty percent (20%) of its Allowed Pumping Allocation for the purpose of providing water to the Exchange Pool. As to any such party so contending such inability, the Water Rights Panel shall make a determination whether the party has so established such inability, which determination shall be subject to review by the Court under the procedure set forth in Part II of this Judgment.

(c) Voluntary Subscriptions. Any party, whether or not having facilities for the taking of imported water, who desires to subscribe to the Exchange Pool a quantity or further quantity of its Allowed Pumping Allocation, may so notify the Water Rights Panel in writing of the quantity of such offer on or prior to the 40th day following the commencement of the particular Administrative Year. Such subscriptions are referred to hereinafter as "voluntary subscriptions." Any Exchangor who desires that any part of its otherwise required subscription not needed to fill Category (a) requests shall be available for Category (b) requests may so notify the Water Rights Panel in writing on or prior to said 40th day. If all of that Exchangor's otherwise required subscription is not needed in order to fill Category (a) requests, the remainder of such required subscription not so used, or such part thereof as such Exchangor may designate, shall be deemed to be a voluntary subscription.

(5) <u>Limitations on Purchases of Exchange Pool Water and Allocation of Requests to Purchase Exchange Pool Water Among Exchangors</u>.

(a) <u>Categories of Requests</u>. Two categories of Exchange Pool requests are established as follows:

(i) <u>Category (a) requests</u>. The quantity requested by each Exchangee, whether or not that Exchangee has an Allowed Pumping Allocation, which quantity is not in excess of 150% of its Allowed Pumping Allocation, if any, or 100 acre feet, whichever is greater. Requests or portions thereof within the above criteria are sometimes hereinafter referred to as "Category (a) requests."

(ii) <u>Category (b) requests</u>. The quantity requested by each Exchangee having an Allowed Pumping Allocation to the extent the request is in excess of 150% of that Allowed

Pumping Allocation or 100 acre feet, <u>whichever</u> is greater, and the quantity requested by each Exchangee having no Allowed Pumping Allocation to the extent the request is in excess of 100 acre feet. Portions of requests within the above criteria are sometimes hereinafter referred to as "Category (b) requests."

(b) <u>Filling of Category (a) Requests</u>. All Exchange Pool subscriptions, required and voluntary, shall be available to fill Category (a) requests. Category (a) requests shall be filled first from voluntary subscriptions, and if voluntary subscriptions should be insufficient to fill all Category (a) requests required subscriptions shall be then utilized to fill Category (a) requests. All Category (a) requests shall be first filled before any Category (b) requests are filled.

(c) <u>Filling of Category (b) Requests</u>. To the extent that voluntary subscriptions have not been utilized in filling Category (a) requests, Category (b) requests shall be filled only out of any remaining voluntary subscriptions. Required subscriptions will then be utilized for the filling of any remaining Category (b) requests.

(d) <u>Allocation of Requests to Subscriptions When Available Subscriptions Exceed Requests</u>. In the event the quantity of subscriptions available for any category of requests exceeds those requests in that category, or exceeds the remainder of those requests in that category, such requests shall be filled out of such subscriptions proportionately in relation to the quantity of each subscription.

(e) <u>Allocation of Subscriptions to Category (b) Requests in the Event of Shortage of Subscriptions</u>. In the event available subscriptions are insufficient to meet Category (b) requests, available subscriptions shall be allocated to each request in the proportion that the particular request bears to the total requests of the particular category.

(6) Additional Voluntary Subscriptions.

If subscriptions available to meet the requests of Exchangees are insufficient to meet all requests, additional voluntary subscriptions may be solicited and received from parties by the Water Rights Panel. Such additional subscriptions shall be allocated first to Category (a) requests to the extent unfilled, and next to Category (b) requests to the extent unfilled. All allocations are to be otherwise in the same manner as earlier provided in paragraph 5 (a) through 5 (e) inclusive.

(7) Effect if Category (a) Requests Exceed Available Subscriptions, Both Required and Voluntary.

In the event that the quantity of subscriptions available to fill Category (a) requests is less than the total quantity of such requests, the Exchangees may, nonetheless, extract the full amount of their Category (a) requests otherwise approved by the Water Rights Panel as if sufficient subscriptions were available. The amounts received by the Water Rights Panel on account of that portion of the approved requests in excess of the total quantities available from Exchangors shall be paid by the Water Rights Panel to WRD in trust for the purpose of purchasing imported water and spreading the same in Central Basin for replenishment thereof. Thereafter WRD may, at any time, withdraw said funds or any part thereof so credited in trust for the aforesaid purpose, or may by the 40th day of any Administrative Year utilize all or any portion of said funds for the purchase of water available from subscriptions by Exchangors in the event the total quantity of such subscriptions exceeds the total quantity of approved requests by parties to purchase Exchange Pool water. To the extent that there is such an excess of available subscriptions over requests and to the extent that the existing credit in favor of WRD is sufficient to purchase such excess quantity at the price established for Exchange Pool purchases during that Administrative Year, the money shall be paid to the Exchangors in the same manner as if another party had made such purchase as an Exchangee. WRD shall not extract any such Exchange Pool water so purchased.

(8) <u>Additional Pumping by Exchangees Pursuant to Exchange Pool Provisions</u>.

An Exchangee may extract from Central Basin in addition to its Allowed Pumping Allocation for a particular Administrative Year that quantity of water which it has requested to purchase from the Exchange Pool during that Administrative Year and which has been allocated to it pursuant to the provisions of paragraphs 5, 6 and 7. The first pumping by an Exchangee in any Administrative Year shall be deemed to be pumping of the party's allocation of Exchange Pool water.

(9) <u>Reduction in Pumping by Exchangors</u>.

Each Exchangor shall in each Administrative Year reduce its extractions of water from Central Basin below its Allowed Pumping Allocation for the particular year in a quantity equal to the quantity of Exchange Pool requests allocated to it pursuant to the provisions of paragraphs 4, 5, 6 and 7 of this Subpart C.

(10) <u>Price to be Paid for Exchange Pool Water</u>.

The price to be paid by Exchangees and to be paid to Exchangors per acre foot for required and voluntary subscriptions of Exchangors utilized to fill requests on the Exchange Pool by Exchangees shall be the dollar amount computed as follows by the Water Rights Panel for each Administrative Year. The "normal" price as of the beginning of the Administrative Year charged by Central Basin Municipal Water District (CBMWD) for treated MWD (Metropolitan Water District of Southern California) water used for domestic and municipal purposes shall be determined, and if on that date there are any changes scheduled during that Administrative Year in CBMWD's "normal" price for such category of water, the weighted daily "normal" CBMWD price shall be determined and used in lieu of the beginning such price; and there shall be deducted from such beginning or weighted price, as the case may be, the "incremental cost of pumping water in Central Basin" at the beginning of the Administrative Year and any then current rate or rates, of assessments levied on the pumping of groundwater in Central Basin by Plaintiff District and any other governmental agency. The "normal" price charged by CBMWD shall be the highest price of CBMWD for normal service excluding any surcharge or higher rate for emergency deliveries or otherwise failing to comply with CBMWD rates and regulations relating to earlier deliveries. The "incremental cost of pumping water in Central Basin" as of the beginning of the Administrative Year shall be deemed to be the Southern California Edison Company Schedule No. PA-1 rate per kilowatt-hour, including all adjustments and all uniform authorized additions to the basic rate, multiplied by 560 kilowatt-hours per acre-foot, rounded to the nearest dollar (which number of kilowatt-hours has been determined to represent the average energy consumption to pump an acre-foot of water in Central Basin). In applying said PA-1 rate the charge per kilowatt-hour under the schedule shall be employed and if there are any rate blocks then the last rate block shall be employed. Should a change occur in Edison schedule designations, the Water Rights Panel shall employ that applicable to motors used for pumping water by municipal utilities.

(11) <u>Carry-over of Exchange Pool Purchases by Exchangees</u>.

An Exchangee who does not extract from Central Basin in a particular Administrative Year a quantity of water equal to the total of (a) its Allowed Pumping Allocation for that particular Administrative Year, reduced by any authorized amount of carryover into the next succeeding Administrative Year pursuant to the provisions of Section III(A) of this Judgment, and (b) the quantity that it purchased from the Exchange Pool for that particular Administrative Year, may carry over into the next succeeding Administrative Year the right to extract from Central Basin a quantity equal to the difference between said total and the quantity actually extracted in that Administrative Year, but not exceeding the quantity purchased from the Exchange Pool for that Administrative Year. Any such carryover shall be in addition to that provided in said Section III(A).

If the "Basinwide Average Exchange Pool Price" in the next succeeding Administrative Year exceeds the "Exchange Pool Price" in the previous Administrative Year any such Exchangee exercising such carryover rights hereinabove provided shall pay to the Watermaster, forthwith upon the determination of the "Exchange Pool Price" in said succeeding Administrative Year, and as a condition to such carryover rights, an additional amount determined by multiplying the number of acre feet of carryover by the difference in "Exchange Pool Price" as between the two Administrative Years. Such additional payment shall be miscellaneous income to the Watermaster which shall be applied by it against that share of the Watermaster's Administrative Body's budget to be paid by the parties to this Agreement for the second Administrative Year succeeding that in which the Exchange Pool water was so purchased. For purposes of this paragraph, the term Basinwide Average Exchange Pool Price means the average price per acre foot paid for Exchange Pool water produced within the Central Basin during the year for which such determination is to be made, taking into account all Exchange Pool transactions consummated during that year.

(12) <u>Notification by Watermaster to Exchangors and Exchangees of Exchange Pool Requests and Allocations Thereof and Price of Exchange Pool Water</u>.

Not later than the 65th day after the commencement of each Administrative Year, the Administrative Body of Watermaster shall determine and notify all Exchangors and Exchangees of the total of the allocated requests for Exchange Pool water and shall provide a schedule divided into categories of requests showing the quantity allocated to each Exchangee and a schedule of the allocation of the total Exchange Pool requirements among the Exchangors. Such notification shall also advise Exchangors and Exchangees of the prices to be paid to Exchangors for subscriptions utilized and the Exchange Pool Price for that Administrative Year as determined by the Water Rights Panel. The determinations of the Watermaster in this regard shall be subject to review by the Court in accordance with the procedure set forth in Part II of this Judgment.

(13) Payment by Exchangees.

Each Exchangee shall, on or prior to last day of the third month of each Administrative Year, pay to the Watermaster one-quarter of said price per acre-foot multiplied by the number of acre feet of such party's approved request and shall, on or before the last day of each of the next succeeding three months, pay a like sum to the Watermaster. Such amounts must be paid by each Exchangee regardless of whether or not it in fact extracts or uses any of the water it has requested to purchase from the Exchange Pool.

(14) Payments to Exchangors.

As soon as possible after receipt of moneys from Exchangees, the Watermaster shall remit to the Exchangors their pro rata portions of the amount so received in accordance with the provisions of paragraph 10 above.

(15) Delinquent Payments.

Any amounts not paid on or prior to any due date above shall carry interest at the rate of 1% per month or any part of a month. Any amounts required to be so paid may be enforced by the equitable powers of the Court, including, but not limited to, the injunctive process of the Court. In addition thereto, the Watermaster, as Trustee for the Exchangors and acting through the Water Rights Panel, may enforce such payment by any appropriate legal action, and shall be entitled to recover as additional damages reasonable attorneys' fees incurred in connection therewith. If any Exchangee shall fail to make any payments required of it on or before 30 days after the last payment is due, including any accrued interest, said party shall thenceforward not be entitled to purchase water from the Exchange Pool in any succeeding Administrative Year except upon order of the Court, upon such conditions as the Court may impose.

IV. <u>PROVISIONS FOR THE STORAGE OF WATER AND THE EXTRACTION OF STORED WATER.</u>

A. <u>Adjudication of Available Dewatered Space, Storage Capacity and Storage Apportionment.</u>

There exists within the Basin a substantial amount of available space which has not been optimally utilized for basin management and for storage of native and imported waters. The Court finds and determines that (i) there is 330,000 acre feet of Available Dewatered Space in the Basin; (ii) use of this Available Dewatered Space will increase reasonable and beneficial use of the Basin by permitting the more efficient procurement and management of Replenishment Water, conjunctive use, and for direct and in-lieu recharge, thereby increasing the prudent storage and recovery of Stored Water for later use by parties to this Judgment, conservation of water and reliability of the water supply available to all Parties; and (iii) use of the Available Dewatered Space pursuant to the terms and conditions of this Judgment will not result in Material Physical Harm.

B. <u>Avoidance of Material Physical Harm.</u>

It is essential that the use of the Available Dewatered Space be undertaken for the greatest public benefit pursuant to uniform, certain, and transparent regulation that encourages the conservation of water and reliability of the water supply, avoids Material Physical Harm, and promotes the reasonable and beneficial use of water. Accordingly, in the event Watermaster becomes aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, relating to the use of the Available Dewatered Space, Watermaster shall, within thirty (30) days thereafter, notice a hearing before the Court and concurrently file a report with the Court, served on all parties, which shall explain the relevant facts then known to Watermaster relating to the Material Physical Harm, or imminent threat thereof, including without limitation, the location of the occurrence, the source or cause, existing and potential physical impacts or consequences of the identified or threatened material Physical Harm, and any recommendations to remediate the identified or threatened Material Physical Harm.

C. Apportionment of Available Dewatered Space.

To fairly balance the needs of the divergent interests of parties having water rights in the Basin, on the one hand, and the replenishment functions of WRD on the other hand, and in consideration of the shared desire and public purpose of removing impediments to the voluntary conservation, storage, exchange and transfer of water, all of the Available Dewatered Space is hereby adjudicated and apportioned into complimentary classifications of Stored Water and a Basin Operating Reserve as set forth in this Part IV. The apportionment contemplates flexible administration of storage capacity where use is apportioned among competing needs, while allowing all Available Dewatered Space to be used from time to time on a "space available" basis, subject to the priorities specified in this Judgment, and as further defined in Section IV(I) of this Judgment. The Court further finds and determines that, of the Available Dewatered Space, there is 220,000 acre-feet of storage capacity in the Central Basin which is presently available ("Adjudicated Storage Capacity"). The use of Adjudicated Storage Capacity as provided in this Judgment will not adversely affect the efficient operation of the Basin or the recharge of water necessary for the production of the parties' respective Allowed Pumping Allocations. The apportionment of Adjudicated Storage Capacity as provided herein will allow for flexible administration of groundwater storage within the Basin. The Adjudicated Storage Capacity is hereby assigned to Individual Storage Allocations and Community Storage as provided herein, provided however that if all space in a particular classification is fully occupied then, on a "space available" basis, to available space within the other classifications of Adjudicated Storage Capacity and, only then, to available space within Basin Operating Reserve.

The Court further finds and determines that, out of the Available Dewatered Space, there is 110,000 acre feet that should be set aside for use by WRD as a Basin Operating Reserve, provided in Section IV(L), and subject to temporary occupancy by Stored Water as permitted hereunder.

No storage of water shall occur in the Basin except in conformity with this Judgment.

D. <u>Individual Storage Allocation</u>.

Each Party having an adjudicated groundwater extraction right hereunder shall have a priority right to store water in an Individual Storage Account, through conversion of Carryover to Stored Water as provided herein, or by any means authorized by this Judgment, up to a maximum of 50% of such party's Allowed Pumping Allocation. The cumulative quantity of Adjudicated Storage Capacity subject to individual storage allocation is 108,750 acre-feet. In recognition of prior importation of water which was introduced into the Basin as Stored Water, and which has not yet been extracted, the Court finds and determines that, as of the date of this Order, the following Parties have occupied a portion of their respective Individual Storage Allocations and have all associated rights therein, as follows:

City of Long Beach:	13,076.8 acre-feet
City of Lakewood:	500 acre-feet
City of Downey:	500 acre-feet
City of Cerritos	500 acre-feet

E. <u>Community Storage; Regional Disadvantaged Communities Incentive Program</u>.

In addition to Individual Storage Allocation, a Party that has fully occupied its Individual Storage allocation may, on a first in time, first in right basis (subject to the limits expressed below) place water into storage in the "Community Storage Pool." The cumulative quantity of Adjudicated Storage Capacity allocated to Community Storage shall be 111,250 acre-feet. So long as there is available capacity in the Community Storage Pool, any Party may store water in the Community Storage Pool through conversion of Carryover to Stored Water as provided herein, or by any other means authorized by this Judgment, provided such Party has first fully occupied that party's available Individual Storage Allocation.

(1) Parties to this Judgment which, as of January 1, 2013, held Allowed Pumping Allocation of not greater than 5,000 acre-feet shall have a first priority right to occupy, in the aggregate, up to 10,000 acre-feet of storage space within the Central Basin Community Storage Pool, on the basis of first in time, first in right.

(2) Water stored pursuant to the Regional Disadvantaged Communities Incentive Program shall have a second priority right to occupy up to 23,000 acre-feet within the Community Storage Pool, on such terms as shall be determined by the Court.

(3) Any further storage in excess of the maximum quantity of Community Storage will be on a "space-available" interim basis. From time to time, and on a "space-available" basis, the total quantity of water available for storage is permitted to exceed Adjudicated Storage Capacity for the Community Storage Pool on an interim basis. This interim storage may occur if storage capacity exists as a result of unused Adjudicated Storage Capacity within other classifications, or available space exists in the Basin Operating Reserve. Such interim storage, however, is subject to priority rights to such Dewatered Space as provided in this Judgment. A party that seeks to convert the water temporarily held in interim storage to a more firm right, may contract for the use of another party's Individual Storage Allocation, or may add such water to the Community Storage Pool once space therein becomes available.

(4) After a party occupies available storage capacity within the Community Storage Pool and then withdraws water from the Community Storage Pool, the storing party will be allowed a period of twenty-four (24) months to refill the evacuated storage before the capacity will be determined excess and available for use by other parties. Once the Basin's Community Storage Pool has been filled for the first time, a party may exercise its twenty-four (24) month refill priority only once, and then only provided there is then capacity available to permit that party to refill the vacated space. Except to the extent Community Storage space may be subject to such priority right to re-fill, all space therein shall be occupied on a first in time, first in right basis.

(5) A party that has occupied storage in the Community Storage Pool for ten (10) consecutive years shall be deemed to extract its Stored Water first in subsequent years (notwithstanding the order of water production set forth in Section I(B)(3)) until its entire Community Storage account has been extracted, but thereafter may again make use of Community Storage on the same terms available to other parties on a first in time, first in right, space-available basis.

(6) Any quantity of water held in the Community Storage Pool for a term greater than ten (10) consecutive years shall be assessed an annual water loss equal to 5% of the lowest quantity of water held within the party's Community Storage Pool account at any time during the immediately preceding ten-year period. The lowest quantity means the smallest amount of water held by the Party in the Community Storage Pool during any of the preceding ten (10) years, with a new loss calculation being undertaken every year. Water subject to the loss assessment will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation. Water lost to the Basin shall constitute water replenished into the Central Basin for the benefit of all parties

F. Limit on Storage.

Irrespective of the category of storage utilized, each party to this Judgment may not cumulatively have in storage at any time Stored Water totaling more than two hundred percent (200%) of that party's Allowed Pumping Allocation. Subject to the foregoing, the right to produce Stored Water may be freely transferred to another party to this Judgment, or as otherwise permitted herein.

G. Extractions of Stored Water; Exemption from Replenishment Assessment.

The Court finds and declares that the extraction of Stored Water as permitted hereunder does not constitute "production of groundwater" within the meaning of Water Code Section 60317 and that no Replenishment Assessment shall be levied on the extraction of Stored Water. WRD has stipulated to the same. This determination reflects the practical application of certain provisions of this Judgment concerning storage of water, including, without limitation, understanding the following: (1) payment of the Replenishment Assessment is required upon the conversion of Carryover Water into storage, and; (2) developed water introduced into the Basin for storage by or on behalf of a Party through spreading or injection need not be replenished by WRD and should not be subject to the Replenishment Assessment.

H. Storage Procedure.

The Administrative Body shall (i) prescribe forms and procedures for the orderly reporting of Stored Water, (ii) maintain records of all water stored in the Basin, and (iii) undertake monitoring and modeling of Stored Water as may be reasonably required. As to any Storage Projects that will require review and approval by the Storage Panel, the Administrative Body shall provide appropriate applications, and shall work with project applicants to complete the application documents for presentation to the Storage Panel. The Administrative Body shall be responsible for conducting any groundwater modeling necessary to evaluate a proposed Storage Project. The proponent of a proposed project will bear all costs associated with the review of the application for approval of the project and all costs associated with its implementation. Nothing in this Judgment shall alter the applicant(s) duty to comply with CEQA or to meet other legal requirements as to any proposed Storage Project. Within thirty (30) days after final submission of the storage application documents, the Administrative Body shall provide notice of the storage application (either by electronic mail or U.S. postal mail), together with a copy of the application documents, to all parties possessing an Allowed Pumping Allocation, and to any other person requesting notice thereof. Following notice, any necessary hearings before the Storage Panel shall be conducted as provided in Section IV(O) of this Judgment.

I. Loss of Stored Water/Relative Priority.

To balance the need to protect priority uses of storage and to encourage the full utilization of Adjudicated Storage Capacity and Basin Operating Reserve where it can be accommodated without interference with priority uses, and except as otherwise provided in this Judgment, no water held in any authorized storage account will be deemed lost from that storage account unless the cumulative quantity of water held as Stored Water plus the quantity of water held within the Basin Operating Reserve exceeds 330,000 acre-feet. Where all Adjudicated Storage Capacity and Basin Operating Reserve has been occupied, the first Stored Water to be deemed lost shall be the last water stored as Community Storage. Upon receipt of a bona fide request by another use entitled to priority hereunder, Watermaster shall issue a notice requiring the other parties to evacuate their Stored Water. Any Stored Water that is not evacuated shall be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation and accounted for accordingly.

J. Limits on Extraction.

Anything in this Judgment to the contrary notwithstanding, no party shall extract greater than 140% of the sum of (i) the party's Allowed Pumping Allocation and (ii) the party's leased water, except upon prior approval by the Water Rights Panel. For this purpose, a party's total extraction right for a particular year shall include that party's Allowed Pumping Allocation and any contractual right through lease or other means to utilize the adjudicated rights of another party. Where such proposed extraction would occur within the Central Basin Pressure Area as defined by Watermaster consistent with historical records, the Water Rights Panel shall submit such request for review by the Board of WRD. The Water Rights Panel shall not approve any request for over-extraction within the Pressure Area without a written finding by the Board of WRD that such over-extraction will not cause Material Physical Harm. The role of the Board of WRD in this process shall not be read to expand or restrict WRD's statutory authority. Consideration shall be on an expedited basis.

K. <u>Increased Extractions in the Central Basin for Certain Water Purveyors</u>.

(1) This Court also maintains continuing jurisdiction over the West Coast Basin, which bounds the Central Basin to the west.

(2) Certain Water Purveyors are parties to both this Amended Judgment and the judgment governing the West Coast Basin and serve communities overlying both the Central Basin and the West Coast Basin.

(3) Certain Water Purveyors may exceed their Allowed Pumping Allocation in any Administrative Year, subject to all of the following conditions:

(a) The Water Purveyor is one of the following eligible Parties:

(i) City of Los Angeles

(ii) Golden State Water Company

(iii) California Water Service Company.

(b) Increased extractions pursuant to this Section shall not exceed 5,000 acre-feet per Water Purveyor for the particular Administrative Year.

(c) Increased extractions pursuant to this Section shall not exceed the Water Purveyor's unused "Adjudicated Rights" in the West Coast Basin.

(d) Increased extractions pursuant to this Section shall not result in Material Physical Harm.

(4) Notwithstanding the foregoing, nothing herein permits extraction

of water within the Central Basin in excess of 140% of Allowed Pumping Allocation for the particular Administrative Year, except as otherwise permitted under this Judgment.

(5) Replenishment of any water extracted from the Central Basin pursuant to this Section shall occur exclusively in the Central Basin.

(6) The benefits of this Section are made available only to the certain Water Purveyors that serve communities overlying the Central Basin and communities overlying the West Basin, in recognition of the management of water resources by those Water Purveyors to serve such overlying communities. It is not made, nor is it related to, a determination of an underflow between the basins, a cost or benefit allocation, or any other factor relating to the allocation of the Replenishment Assessment.

L. <u>Special Provisions for Temporary Storage within Community Storage Pool.</u>

The Central Basin Municipal Water District ("CBMWD") shall take such action as may be necessary to reduce its Allowed Pumping Allocation to five (5) acre-feet or fewer by December 31, 2018, and has agreed, by stipulation, not to acquire any additional Central Basin water rights. Upon application by CBMWD, the Storage Panel may, after making each of the findings required in this subsection, approve storage of water by CBMWD within the Community Storage Pool subject to the stated conditions. The Storage Panel may only authorize such storage after finding each of the following to be true as of the date of such approval:

(1) CBMWD (a) then owns five (5) acre-feet or fewer of Allowed Pumping Allocation, and (b) has not produced water utilizing any extraction rights it holds within the Basin but has only engaged in the sale or leasing of those rights to others.

(2) There is available space for Storage within the Community Storage

Pool.

(3) CBMWD has identified a source of imported water that may be brought into the Basin and stored underground.

(4) The water identified for storage (a) is unlikely to be acquired by other parties through surface delivery for use within the Basin, and (b) was offered to WRD to purchase for replenishment purposes at the same price that CBMWD otherwise sells imported water to WRD and WRD declined to purchase said water, within a reasonable period of time.

(5) There will be no Material Physical Harm associated with the introduction of the water into storage, or its extraction, in the manner approved by the Storage Panel.

The condition expressed in Section IV(L)(1)(a) above shall not be operative until January 1, 2019, or upon reduction of CBMWD's Allowed Pumping Allocation to five (5) acre-feet or fewer, whichever first occurs. CBMWD may not extract the Stored Water, and may instead only transfer that Stored Water to a party having extraction rights, or to WRD for replenishment purposes only. Such Stored Water not so transferred within three (3) years following its storage may be purchased by WRD, at its option, for replenishment purposes only, at a price not exceeding the actual cost incurred by CBMWD in importing and storing the water in the first instance, plus a reasonable administrative charge for overhead not exceeding five percent (5%) of the price paid by CBMWD for the water with no other fees or markups imposed by CBMWD. Except as otherwise permitted in this Section, any such Stored Water held by CBMWD for a term greater than three (3) years shall be assessed an annual water loss equal to 10% of the amount of such Stored Water at the end of each year. Water subject to the loss assessment will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without further compensation. The Storage Panel shall grant CBMWD one or more extensions of such term, not exceeding total extensions of three (3) additional years, following public hearing, if the Storage Panel determines that the Stored Water has been actively marketed by CBMWD for transfer to Parties on reasonable terms in the previous year. The Storage Panel may impose such additional reasonable conditions as it determines to be appropriate. Any review by the Storage Panel hereunder shall only occur at a public hearing held following at least 15 days' (but not more than 30 days') mailed notice to all Parties to this Judgment, at which hearing an opportunity for public comment shall be afforded in advance of any such decision. However, the Storage Panel may consider an application on shorter notice under exigent circumstances, including the potential loss of the water proposed to be stored if action is not taken sooner. CBMWD shall have the right to appeal any action or inaction by the Storage Panel to this court. The storage and extraction of Stored Water hereunder shall otherwise be subject to all other provisions of this Judgment. The court finds and declares that this subsection constitutes a "court order issued by a court having jurisdiction over the adjudication of groundwater extraction rights within the groundwater basin where storage is sought" within the meaning of Water Code §71610(b)(2)(B). Nothing in this provision impedes CBMWD's ability to store water pursuant to a contract with an adjudicated groundwater extraction rights holder as permitted by Water Code § 71610(b)(2)(A) and otherwise in accordance with this Judgment.

M. Basin Operating Reserve.

It is in the public interest and in furtherance of the physical solution for WRD to prudently exercise its statutory discretion to purchase, spread, and inject Replenishment Water, to provide for in-lieu replenishment, and otherwise to fulfill its replenishment function within the Basin as provided in Water Code Section 60000 et. seq. Hydrologic, regulatory and economic conditions now prevailing within the State require that WRD be authorized to exercise reasonable discretion and have flexibility in the accomplishment of its replenishment function. Accordingly, WRD may pre-purchase or defer the purchase of Replenishment Water, and may otherwise purchase and manage available sources of Replenishment Water under the most favorable climatic and economic conditions as it may determine reasonable and prudent under the circumstances. It is the intent of the parties to preserve space for such replenishment activities, including capture of natural inflows during wet years, recapture of water when possible, and artificial replenishment when water is available at discounted rate, for the benefit of the Basin and the parties to the Judgment. The Basin Operating Reserve is intended to allow WRD to meet its replenishment needs to make APA available for extraction by all water rights holders. Accordingly, WRD shall have a priority right to occupy up to 110,000 acre-feet of the Available Dewatered Space as the "Basin Operating Reserve" for the acquisition and replenishment of water, or to ensure space remains available in the Basin to capture natural inflows during wet years for the benefit of the parties to the Judgment, to offset over-production. The priority right is not intended to allow WRD to sell or lease stored water, storage, or water rights. To the extent WRD does not require the use of all of such Basin Operating Reserve, that portion of the Basin Operating Reserve that is not then being used shall be available to other Parties to store water on a temporary and space-available basis. No Party may use any portion of the Basin Operating Reserve for space-available storage unless that Party has already maximized its allowed Storage pursuant to its Individual Storage Allocation and all available Community Storage is already in use. WRD's failure to use any portion of its Basin Operating Reserve shall not cause forfeiture or create a limitation of its right to make use of the designated space in the future. WRD's first priority right to this category of space shall be absolute. To the extent that there is a conflict between WRD and a third party regarding the availability of and desire to use any portion of the space available for replenishment up to the maximum limits set forth in this section, the interests of WRD will prevail. If a party other than

WRD is using the Basin Operating Reserve space on a "space available" basis and a conflict develops between WRD and the storing party, the storing party will, upon notice from WRD, evacuate the Stored Water within ninety (90) days thereafter. In such event, temporary occupancy within the Basin Operating Reserve shall be first in time, first in right, and the last Party to store water shall be required to evacuate first until adequate space shall be made available within the Basin Operating Reserve to meet WRD's needs. The storing party or parties assume all risks of waste, spill and loss regardless of the hardship. Stored Water that is not evacuated following WRD's notice of intent to occupy the Basin Operating Reserve will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation and accounted for accordingly. Nothing herein shall permit WRD to limit or encumber, by contract or otherwise, its right to use the Basin Operating Reserve for Replenishment purposes for any reason, or to make space therein available to any person by any means. Notwithstanding the foregoing, to the extent excess space is available, water evacuated from the Basin Operating Reserve as provided in this Section shall be deemed added to available space within the Individual Storage Allocations and Community Storage Pool, subject to the priority rights otherwise provided in this Judgment.

N. Water Augmentation.

The parties, in coordination with WRD, may undertake projects that add to the long-term reliable yield of the Basin. Innovations and improvements in practices that increase the conservation and maximization of the reasonable and beneficial use of water should be promoted. To the extent that Parties to the Judgment, in coordination with WRD, implement a project that provides additional long-term reliable water supply to the Central Basin, the annual extraction rights in the Central Basin will be increased commensurately in an amount to be determined by the Storage Panel to reflect the actual yield enhancement associated with the project. Augmented supplies of water resulting from such a project may be extracted or stored as permitted in this Judgment in the same manner as other water. Participation in any Water Rights Augmentation Project shall be voluntary. A party may elect to treat a proposed project as a Water Augmentation Project (for the purpose of seeking an increase in that party's Allowed Pumping Allocation) or may elect to treat such a project as a Storage Project under the other provisions of this Judgment. The terms of participation in any Water Augmentation Project will be at the full discretion of the participating parties. All Water Augmentation Projects will be approved by the Storage Panel.

(1) Participating Parties.

Parties who propose a Water Augmentation Project ("Project Leads") may do so in their absolute discretion, upon such terms as they may determine. All other parties to this Judgment will be offered an opportunity to participate in the Water Augmentation Project on condition that they share proportionally in common costs and benefits, and assume the obligation to bear exclusively the cost of any improvements that are required to accommodate their individual or particular needs. Notice shall be provided which generally describes the project and the opportunity to participate with sufficient time for deliberation and action by any of these parties who could potentially participate. Disputes over the adequacy of notice shall be referred to the Storage Panel, and then to the Court under its continuing jurisdiction. Parties who elect to participate ("Project Participants") may do so provided they agree to offer customary written and legally binding assurances that they will bear their proportionate costs attributable to the Water Rights Augmentation Project, or provide other valuable consideration deemed sufficient by the Project Leads and the Project Participants.

(2) Determination of Additional Extraction Rights.

The amount of additional groundwater extraction as a result of a Water Augmentation project will be determined by the Storage Panel, subject to review by the Court. The determination will be based upon substantial evidence which supports the finding that the Water Augmentation project will increase the long-term sustainable yield of the respective Basin by an amount at least equal to the proposed increase in extraction rights.

(3) Increase in Extraction Rights.

A party that elects to participate and pays that party's full pro-rata share of costs associated with any Water Augmentation Project and/or reaches an agreement with other participants based upon other valuable consideration acceptable to the Project Leads and Project Participants, will receive a commensurate increase in extraction rights. Non-participating parties will not receive an increase or a decrease in extraction rights. Any party that elects not to participate will not be required to pay any of the costs attributable to the particular Water Augmentation Project, whether directly or indirectly as a component of the WRD Replenishment Assessment.

(4) Nominal Fluctuations.

Because water made available for Water Rights Augmentation will be produced annually, fluctuations in groundwater levels will be temporary, nominal and managed within the Basin Operating Reserve.

(5) Availability of New Water.

The amount of additional groundwater extraction established as a result of a Water Augmentation Project shall be equal to the quantity of new water in the Basin that is attributable to that Water Augmentation Project. No extraction shall occur and no extraction right shall be established until new water has been actually introduced into the Basin as a result of the Project. Any approval for a Water Augmentation Project shall include provisions (a) requiring regular monitoring to determine the actual amount of such new water made available, (b) requiring make-up water or equivalent payment therefor to the extent that actual water supply augmentation does not meet projections, and (c) adjusting extraction rights attributable to the Water Augmentation Project to match the actual water created. The right to extract augmented water from the Basin resulting from a party's participation in a Water Augmentation Project shall be accounted for separately and shall not be added to a party's Allowed Pumping Allocation. No Replenishment Assessment shall be levied against the extraction of augmented water.

(6) Limitation.

Notwithstanding the foregoing, WRD will not obtain any water rights or extraction rights under this Judgment by virtue of its participation in a Water Augmentation Project. If WRD participates in a Water Rights Augmentation Project through funding or other investments, its allocation of new water from the project shall be used to offset its replenishment responsibilities.

O. Limits on Watermaster Review.

It shall not be necessary for Watermaster, or any constituent body thereof, to review or approve any of the following before the affected Party may proceed: (i) exercise of adjudicated water rights consistent with this Judgment, except for extraction above 140% of a Party's extraction right as set out in Section IV(J) of this Judgment; (ii) replenishment of the Basin with Replenishment Water by WRD consistent with Water Code Section 60000 et seq., including replenishment of water produced by water rights holders through the exercise of adjudicated water rights; (iii) WRD's operations within the Basin Operating Reserve; (iv) Carryover Conversion or other means of the filling of the Individual Storage Accounts and the Community Storage Pool, as provided in this Judgment, as long as existing water production, spreading, or injection facilities are used; and (v) individual transfers of the right to produce Stored Water as permitted in Section IV(F). All other Storage Projects and all Water Augmentation Projects shall be subject to review and approval as provided herein, including (i) material variances to substantive criteria governing projects exempt from the review and approval process, (ii) modifications to previously approved Storage Projects and agreements, (iii) a party's proposal for Carryover Conversion in quantities greater than the express apportionment of Adjudicated Storage Capacity on a non-priority, space-available, interim basis, and (iv) Storage, by means other than Carryover Conversion, when new production, spreading, or injection facilities are proposed to be utilized.

P. Hearing Process For Watermaster Review.

The following procedures shall be followed by Watermaster where Watermaster review of storage or extraction of Stored Water is required or permitted under this Judgment:

(1) No later than thirty (30) days after notice has been issued for the storage application, the matter shall be set for hearings before the Storage Panel. A staff report shall be submitted by WRD staff in conjunction with the completed storage application documents and the Water Rights Panel may prepare an independent staff report, if it elects to do so.

(2) The Board of WRD and the Water Rights Panel (sitting jointly as the Storage Panel) shall conduct a joint hearing concerning the storage application.

(3) All Watermaster meetings shall be conducted in the manner prescribed by the applicable Rules and Regulations. The Rules shall provide that all meetings of Watermaster shall be open to water rights holders and that reasonable notice shall be given of all meetings.

(4) The Board of WRD and the Water Rights Panel shall each adopt written findings explaining its decision on the proposed Storage Project, although if both entities reach the same decision on the Storage Project, they shall work together to adopt a uniform set of findings.

(5) Unless both the Board of WRD and the Water Rights Panel approve the Storage Project, the Storage Project application shall be deemed denied (a "Project Denial"). If both the Board of WRD and the Water Rights Panel approve the Storage Project, the Storage Project shall be deemed approved (a "Project Approval").

Q. Trial Court Review

(1) The applicant may seek the Storage Panel's reconsideration of a

Project Denial. However, there shall be no process for mandatory reconsideration or mediation of a Project Approval or a Project Denial either before the Administrative Body, or before the Water Rights Panel.

(2) Any Party may file an appeal from a Project Approval or Project Denial with this Court, as further described in Section II(F).

(3) In order to (a) promote the full presentation of all relevant evidence before the Storage Panel in connection with its consideration of any proposed Storage Project, (b) achieve an expeditious resolution of any appeal to the Court, and (c) accord the appropriate amount of deference to the expertise of the Storage Panel, the appeal before the Court shall be based solely on the administrative record, subject only to the limited exception in California Code of Civil Procedure section 1094.5(e).

(4) If both the WRD Board and the Water Rights Panel each vote to deny or approve a proposed Storage Project, it shall be an action by the Storage Panel and that decision shall be accorded by the Court deference according to the substantial evidence test. If one of the reviewing bodies votes to approve the proposed Storage Project and the other reviewing body votes to deny the proposed storage project, then the Court's review shall be *de novo*, although still restricted to the administrative record. In the case of any *de novo* Trial Court review, the findings made by the respective Watermaster bodies shall not be accorded any weight independent of the evidence supporting them.

R. Space Available Storage, Relative Priority, and Dedication of "Spilled" Water.

To balance the need to protect priority uses of storage and to encourage the full utilization of Available Dewatered Space within the Adjudicated Storage Capacity and the Basin Operating Reserve, any Party may make interim, temporary use of then currently unused Available Dewatered Space within any category of Adjudicated Storage Capacity, and then if all Adjudicated Storage Capacity is being fully used for Stored

Water within the Basin Operating Reserve ("Space-Available Storage"), subject to the following criteria:

(1) Any Party may engage in Space-Available Storage without prior approval from Watermaster provided that the storing Party or Parties shall assume all risks of waste, spill, and loss regardless of the hardship. Whenever the Storage Panel determines that a Party is making use of excess Available Dewatered Space for Space-Available Storage, the Storage Panel shall issue written notice to the Party informing them of the risk of spill and loss.

(2) Whenever the Available Dewatered Space is needed to accommodate the priority use within a respective category of Adjudicated Storage Capacity, or WRD seeks to make use of its priority right to the Basin Operating Reserve to fulfill its replenishment function, the Storage Panel shall issue a notice to evacuate the respective category of Adjudicated Storage Capacity or Basin Operating Reserve, as applicable, within the time-periods set forth within this Amended Judgment. To the extent the Stored Water is not timely evacuated such Stored Water will be placed into any other excess Available Dewatered Space, first within the Adjudicated Storage Capacity, if available, and then if all Adjudicated Storage Capacity is being fully used for Stored Water within the Basin Operating Reserve. If no excess Available Dewatered Space is available within the Basin Operating Reserve, then the Stored Water shall be deemed spilled and will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation and accounted for accordingly. A Party that seeks to convert the Stored Water temporarily held in interim storage as Space-Available Storage to a more firm right, may in its discretion, contract for the use of another Party's Individual Storage Allocation, or may add such water to the Community Storage Pool once space therein becomes available.

(3) No Stored Water will be deemed abandoned unless the cumulative

quantity of water held as Stored Water plus the quantity of water held in the Basin Operating Reserve exceeds 330,000 (three hundred and thirty thousand) acre-feet in the Central Basin.

V. CONTINUING JURISDICTION OF THE COURT.

The Court hereby reserves continuing jurisdiction and upon application of any interested party, or upon its own motion, may review and redetermine the following matters and any matters incident thereto:

A. Its determination of the permissible level of extractions from Central Basin in relation to achieving a balanced basin and an economic utilization of Central Basin for groundwater storage, taking into account any then anticipated artificial replenishment of Central Basin by governmental agencies for the purpose of alleviating what would otherwise be annual overdrafts upon Central Basin and all other relevant factors.

B. Whether in accordance with applicable law any party has lost all or any portion of his rights to extract groundwater from Central Basin and, if so, to ratably adjust the Allowed Pumping Allocations of the other parties and ratably thereto any remaining Allowed Pumping Allocation of such party.

C. To remove any Watermaster or constituent body appointed from time to time and appoint a new Watermaster; and to review and revise the duties, powers and responsibilities of the Watermaster or its constituent bodies and to make such other and further provisions and orders of the Court that may be necessary or desirable for the adequate administration and enforcement of the Judgment.

D. To revise the price to be paid by Exchangees and to Exchangors for Exchange Pool purchases and subscriptions.

E. In case of emergency or necessity, to permit extractions from Central Basin for such periods as the Court may determine: (i) ratably in excess of the Allowed Pumping Allocations of the parties; or (ii) on a non-ratable basis by certain parties if either compensation or other equitable adjustment for the benefit of the other parties is provided. Such overextractions may be permitted not only for emergency and necessity arising within Central Basin area, but to assist the remainder of the areas within The Metropolitan Water District of Southern California in the event of temporary shortage or threatened temporary shortage of its imported water supply, or temporary inability to deliver the same throughout its area, but only if the court is reasonably satisfied that no party will be irreparably damaged thereby. Increased energy cost for pumping shall not be deemed irreparable damage. Provided, however, that the provisions of this subparagraph will apply only if the temporary shortage, threatened temporary shortage, or temporary inability to deliver was either not reasonably avoidable by the Metropolitan Water District, or if reasonably avoidable, good reason existed for not taking the steps necessary to avoid it.

F. To review actions of the Watermaster.

G. To assist the remainder of the areas within The Metropolitan Water District of Southern California within the parameter set forth in subparagraph (e) above.

H. To provide for such other matters as are not contemplated by the Judgment and which might occur in the future, and which if not provided for would defeat any or all of the purposes of this Judgment to assure a balanced Central Basin subject to the requirements of Central Basin Area for water required for its needs, growth and development.

The exercise of such continuing jurisdiction shall be after 30 days' notice to the parties, with the exception of the exercise of such continuing jurisdiction in relation to subparagraphs E and G above, which may be *ex parte,* in which event the matter shall be forthwith reviewed either upon the Court's own motion or the motion of any party upon which 30 days' notice shall be so given. Within ten (10) days of obtaining any *ex parte* order, the party so obtaining the same shall mail notice thereof to the other parties. If any other party desires Court review thereof, the party obtaining the *ex parte* order shall bear the reasonable expenses of mailing notice of the proceedings, or may in lieu thereof undertake the mailing. Any contrary or modified decision upon such review shall not prejudice any party who relied on said *ex parte* order.

VI. GENERAL PROVISIONS.

A. Judgment Constitutes Inter Se Adjudication.

This Judgment constitutes an inter se adjudication of the respective rights of all parties, except as may be otherwise specifically indicated in the listing of the water rights of the parties of this Judgment, or in Appendix "2" hereof. All parties to this Judgment retain all rights not specifically determined herein, including any right, by common law or otherwise, to seek compensation for damages arising out of any act or omission of any person. This Judgment constitutes a "court order" within the meaning of Water Code Section 71610(B)(2)(b).

B. Assignment, Transfer, Etc., of Rights.

Subject to the other provision of this Judgment, and any rules and regulations of the Watermaster requiring reports relative thereto, nothing herein contained shall be deemed to prevent any party hereto from assigning, transferring, licensing or leasing all or any portion of such water rights as it may have with the same force and effect as would otherwise be permissible under applicable rules of law as exist from time to time.

C. Service Upon and Delivery to Parties of Various Papers.

Service of the Judgment on those parties who have executed that certain Stipulation and Agreement for Judgment or who have filed a notice of election to be bound by the Exchange Pool provisions shall be made by first class mail, postage prepaid, addressed to the designee and at the address designated for that purpose in the executed and filed Counterpart of the Stipulation and Agreement for Judgment or in the executed and filed "Notice of Election to be Bound by Exchange Pool Provisions," as the case may be, or in any substitute designation filed with the Court.

Each party who has not heretofore made such a designation shall, within 30 days after the Judgment shall have been served upon that party, file with the Court, with proof of service of a copy 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 designation filed and served in the same manner by any party shall be effective from the date of 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, or any item required to be served upon or delivered to a party under or pursuant to the Judgment may be by deposit in the mail, first class, postage prepaid, addressed to the designee and at the address in the latest designation filed by that party.

D. <u>Judgment Does Not Affect Rights, Powers, Etc., of Plaintiff District</u>.

Nothing herein constitutes a determination or adjudication which shall foreclose Plaintiff District from exercising such rights, powers, privileges and prerogatives as it may now have or may hereafter have by reason of provisions of law.

E. <u>Continuation of Order under Interim Agreement</u>.

The order of Court made pursuant to the "Stipulation and Interim Agreement and Petition for Order" shall remain in effect through the Administrative Year in which this Judgment shall become final (subject to the reserved jurisdiction of the Court).

F. <u>Effect of Extractions by Exchangees; Reductions in Extractions</u>.

With regard to Exchange Pool purchases, the first extractions by each Exchangee shall be deemed the extractions of the quantities of water which that party is entitled to extract pursuant to his allocation from the Exchange Pool for that Administrative Year. Each Exchangee shall be deemed to have pumped his Exchange Pool request so allocated for and on behalf of each Exchangor in proportion to each Exchangor's subscription to the Exchange Pool which is utilized to meet Exchange Pool requests. No Exchangor shall ever be deemed to have relinquished or lost any of its rights determined in this

Judgment by reason of allocated subscriptions to the Exchange Pool. Each Exchangee shall be responsible as between Exchangors and that Exchangee, for any tax or assessment upon the production of groundwater levied for replenishment purposes by WRD or by any other governmental agency with respect to water extracted by such Exchangee by reason of Exchange Pool allocations and purchases. No Exchangor or Exchangee shall acquire any additional rights, with respect to any party to this action, to extract waters from Central Basin pursuant to Water Code Section 1005.1 by reason of the obligations pursuant to and the operation of the Exchange Pool.

G. Judgment Binding on Successors, Etc.

This Judgment and all provisions thereof are applicable to and binding upon 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.

H. Costs.

No party shall recover its costs herein as against any other party.

I. Intervention of Successors in Interest and New Parties.

Any person who is not a party (including but not limited to successors or parties who are bound by this Judgment) and who proposes to produce water from the Basin, store water in the Basin, or exercise water rights of a predecessor may seek to become a party to this Judgment through a Stipulation in Intervention entered into with the Plaintiff. Plaintiff 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 to the parties. Thereafter, if approved by the Court, such intervenor shall be a party bound by this Judgment and entitled to the rights and privileges accorded under the physical solution herein.

J. Effect of this Amended Judgment on Orders Filed Herein.

This Third Amended Judgment shall not abrogate such rights of additional carryover of unused water rights as may otherwise exist pursuant to orders herein filed June 2, 1977 and September 29, 1977.

THE CLERK WILL ENTER THIS THIRD AMENDED JUDGMENT FORTHWITH.

DATED: 12-23-13

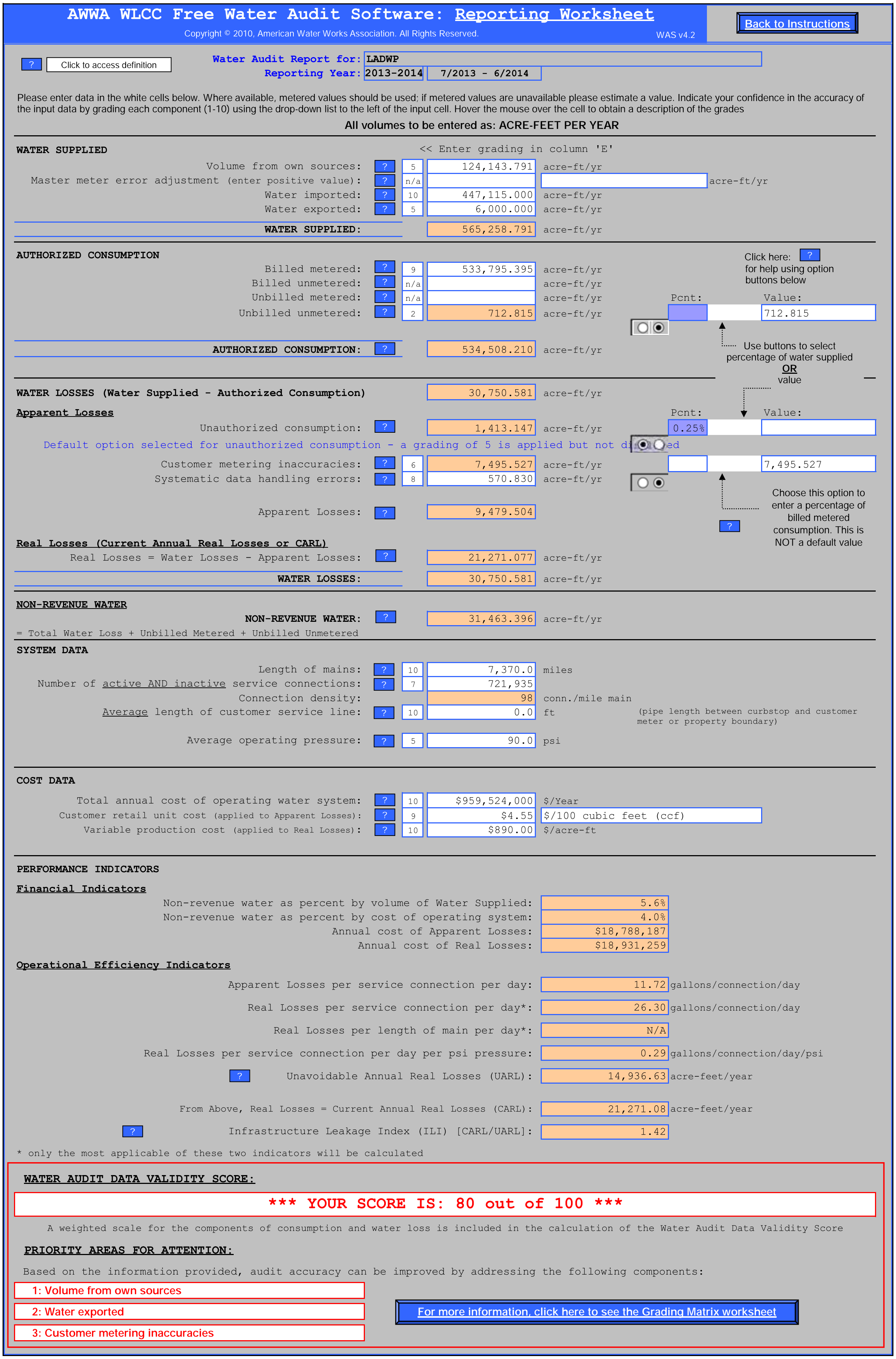
ABRAHAM KHAN

Judge of the Superior Court

Urban Water
Management Plan

Appendix G

AWWA Water Loss Audit Worksheet



AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.2

Water Audit Report for: LADWP
Reporting Year: 2013-2014 7/2013 - 6/2014

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED

<< Enter grading in column 'E'

Volume from own sources:	5	124,143.791	acre-ft/yr
Master meter error adjustment (enter positive value):	n/a		acre-ft/yr
Water imported:	10	447,115.000	acre-ft/yr
Water exported:	5	6,000.000	acre-ft/yr
WATER SUPPLIED:		565,258.791	acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ?
for help using option buttons below

Billed metered:	9	533,795.395	acre-ft/yr
Billed unmetered:	n/a		acre-ft/yr
Unbilled metered:	n/a		acre-ft/yr
Unbilled unmetered:	2	712.815	acre-ft/yr
AUTHORIZED CONSUMPTION:		534,508.210	acre-ft/yr

Pcnt: Value: 712.815 ○ ●

Use buttons to select percentage of water supplied
OR
value

WATER LOSSES (Water Supplied - Authorized Consumption)

30,750.581 acre-ft/yr

Apparent Losses

Unauthorized consumption:		1,413.147	acre-ft/yr

Pcnt: 0.25% Value: ● ○

Default option selected for unauthorized consumption - a grading of 5 is applied but not di● ○ed

Customer metering inaccuracies:	6	7,495.527	acre-ft/yr
Systematic data handling errors:	8	570.830	acre-ft/yr
Apparent Losses:		9,479.504	

Value: 7,495.527 ○ ●

Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	21,271.077	acre-ft/yr
WATER LOSSES:	30,750.581	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 31,463.396 acre-ft/yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	7,370.0	miles
Number of active AND inactive service connections:	7	721,935	
Connection density:		98	conn./mile main
Average length of customer service line:	10	0.0	ft (pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	5	90.0	psi

COST DATA

Total annual cost of operating water system:	10	$959,524,000	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$4.55	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	10	$890.00	$/acre-ft

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	5.6%	
Non-revenue water as percent by cost of operating system:	4.0%	
Annual cost of Apparent Losses:	$18,788,187	
Annual cost of Real Losses:	$18,931,259	

Operational Efficiency Indicators

Apparent Losses per service connection per day:	11.72	gallons/connection/day
Real Losses per service connection per day*:	26.30	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.29	gallons/connection/day/psi
Unavoidable Annual Real Losses (UARL):	14,936.63	acre-feet/year
From Above, Real Losses = Current Annual Real Losses (CARL):	21,271.08	acre-feet/year
Infrastructure Leakage Index (ILI) [CARL/UARL]:	1.42	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 80 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

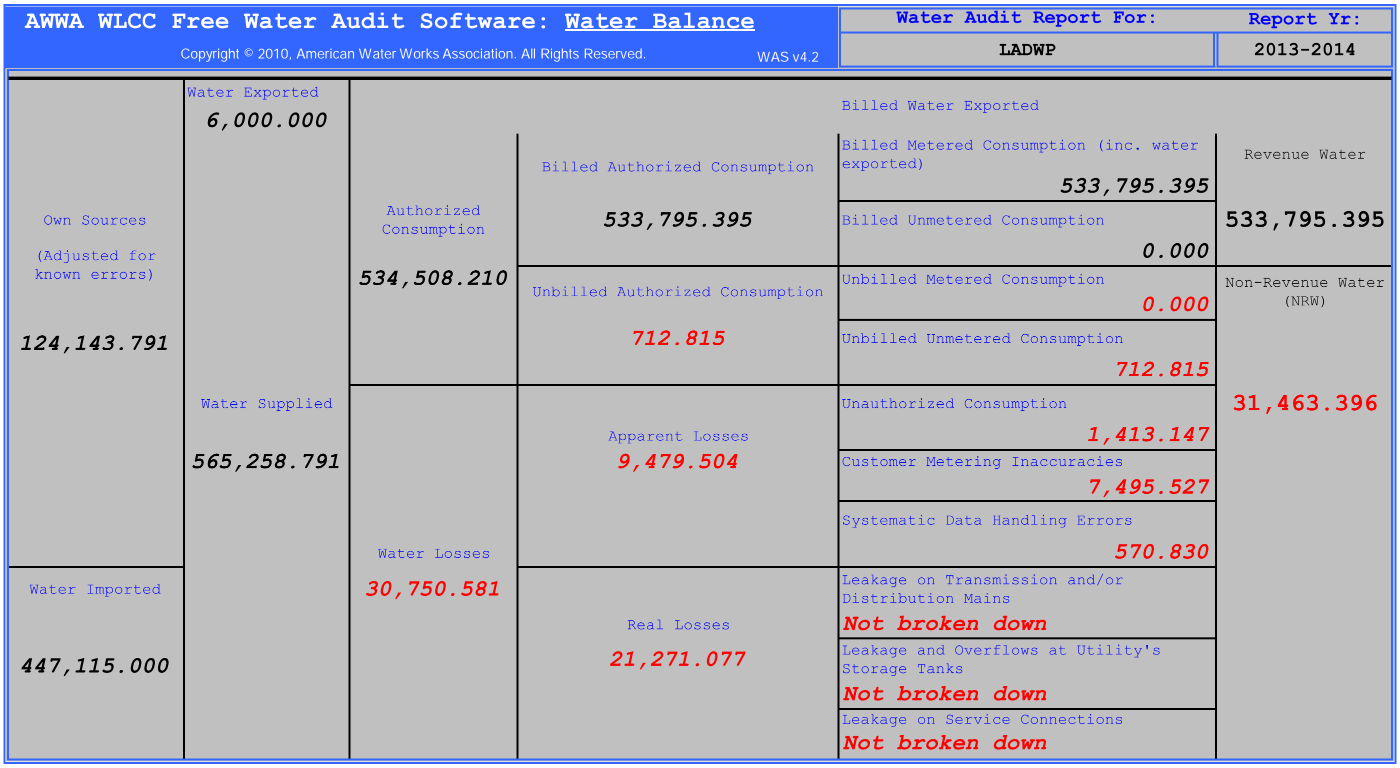
PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Water exported
3: Customer metering inaccuracies

For more information, click here to see the Grading Matrix worksheet

AWWA Water Loss Control Committee Reporting Worksheet 1



AWWA WLCC Free Water Audit Software: Water Balance

WAS v4.2

Water Audit Report For:	Report Yr:
LADWP	2013-2014

Own Sources (Adjusted for known errors) 124,143.791	Water Exported 6,000.000			Billed Water Exported	
	Water Supplied 565,258.791	Authorized Consumption 534,508.210	Billed Authorized Consumption 533,795.395	Billed Metered Consumption (inc. water exported) 533,795.395	Revenue Water 533,795.395
				Billed Unmetered Consumption 0.000	
			Unbilled Authorized Consumption 712.815	Unbilled Metered Consumption 0.000	Non-Revenue Water (NRW) 31,463.396
				Unbilled Unmetered Consumption 712.815	
		Water Losses 30,750.581	Apparent Losses 9,479.504	Unauthorized Consumption 1,413.147	
				Customer Metering Inaccuracies 7,495.527	
				Systematic Data Handling Errors 570.830	
Water Imported 447,115.000			Real Losses 21,271.077	Leakage on Transmission and/or Distribution Mains Not broken down	
				Leakage and Overflows at Utility's Storage Tanks Not broken down	
				Leakage on Service Connections Not broken down	

Urban Water
Management Plan

Appendix H

CUWCC Biennal Reports

CUWCC BMP Retail Coverage Report 2014

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

152 Los Angeles Dept. of Water and Power

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name: Penny Falcon

Title: Conservation Policy, Legislation & Grants Manager

Email: penny.falcon@ladwp.com

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	Revised Water Conservation Ordinance 2010.pdf		ORDINANCE NO. 181288 - An ordinance amending Chapter XII, Article I of the Los Angeles Municipal Code to clarify prohibited uses and modify certain water conservation requirements of the Water Conservation Plan of the City of Los Angeles.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As No

CUWCC BMP Retail Coverage Report 2014

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

Exemption	No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **ON TRACK**

152 Los Angeles Dept. of Water and Power

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
LADWP_AWWA Water Balance _ FY13-14 Final.xls	
AWWA Water Audit Validity Score?	80
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
2773	890	890	0	False	34694100	

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

152 Los Angeles Dept. of Water and Power

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	77638
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 12/20/2013

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

152 Los Angeles Dept. of Water and Power

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	441899553.54	0
Multi-Family	Increasing Block	Yes	327022644.21	5146192.36
Commercial	Increasing Block	Yes	193481186.8	11671382.07
Industrial	Increasing Block	Yes	37681520.11	1925693.97
Institutional	Increasing Block	Yes	45869329.64	1926141.13
Dedicated Irrigation	Increasing Block	Yes	10838338.82	0
			1056792573.12	**20669409.53**

Calculate: V / (V + M) **98 %**

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: No

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

152 **Los Angeles Dept. of Water and Power** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Metropolitan Water District of SC
Metropolitan Water District of SC

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	Number
Newsletter articles on conservation	10
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	10000
Landscape water conservation media campaigns	10000
Website	62369
Total	**82379**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Articles or stories resulting from outreach	1600
News releases	14
Newspaper contacts	600
Radio contacts	500
Television contacts	500
Total	**3214**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Full Outreach Budget	2000000
Total Amount:	**2000000**

Public Outreah Additional Programs
Public events/booth staffing (147 events with 30,000 people reached, 10,000 units of collateral material distributed)

Description of all other Public Outreach programs

BMP 2.1 Public Outreach

ON TRACK

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

152 Los Angeles Dept. of Water and Power **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Metropolitan Water District of SC

Materials meet state education framework requirements? Yes

Guidebook, conservation literature with lessons on water saving.

Materials distributed to K-6? Yes

Teacher received a 60-page lesson package that included lessons on water supply sources, outdoor conservaiton practives as well as a home and school water conservation survey questionnaire.

Materials distributed to 7-12 students? Yes (Info Only)

Teacher received a 60-page lesson package that included lessons on water supply sources, outdoor conservaiton practives as well as a home and school water conservation survey questionnaire.

Annual budget for school education program: 500000.00

Description of all other water supplier education programs

Live Theatre performances called Thirsty City and Thirsty City Jr., includes K-3 and 4-6 age specific water conservation information.

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2014

152 Los Angeles Dept. of Water and Power

GPCD in 2006: 153.24

GPCD in 2014 127.7

GPCD Target for 2018: 125.70

Biennial GPCD Compliance Table

ON TRACK

		Target		Highest Acceptable Bound	
Year	Report	% Base	GPCD	% Base	GPCD
2010	1	96.4%	**147.70**	100%	**153.20**
2012	2	92.8%	**142.20**	96.4%	**147.70**
2014	3	89.2%	**136.70**	92.8%	**142.20**
2016	4	85.6%	**131.20**	89.2%	**136.70**
2018	5	82.0%	**125.70**	82.0%	**125.70**

CUWCC BMP Retail Coverage Report 2013

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

152 Los Angeles Dept. of Water and Power

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name: Penny Falcon

Title: Conservation Policy, Legislation & Grants Manager

Email: penny.falcon@ladwp.com

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.	Revised Water Conservation Ordinance 2010.pdf		
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Retail Coverage Report 2013

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices **ON TRACK**

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **ON TRACK**

152 Los Angeles Dept. of Water and Power

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
Copy_of_LADWP_AWWA_Water_Balance___FY12-13_Final.xls	
AWWA Water Audit Validity Score?	80
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
2749	847	847	0	False	39100400	

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

152 Los Angeles Dept. of Water and Power

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	80142
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 12/20/2013

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption No

Comments:

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BMP 1.4 Retail Conservation Pricing

On Track

152 Los Angeles Dept. of Water and Power

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	386024482.6	0
Multi-Family	Increasing Block	Yes	287690533.1	5241996.94
Commercial	Increasing Block	Yes	168262963.5	11633894.51
Industrial	Increasing Block	Yes	29393150.59	1993578.57
Institutional	Increasing Block	Yes	41368242.29	1910918.65
Dedicated Irrigation	Increasing Block	Yes	11541242.37	0
			924280614.45	**20780388.67**

Calculate: V / (V + M) **98 %**

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: No

At Least As effective As No

Exemption No

Comments:

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BMP 2.1 Public Outreach

ON TRACK

152 **Los Angeles Dept. of Water and Power** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Metropolitan Water District of SC

Metropolitan Water District of SC

Agency Name	ID number
Metropolitan Water District of SC	161

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	**Number**
Newsletter articles on conservation	5
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	485000
Landscape water conservation media campaigns	5000
Website	20502
Total	**510507**

Did at least one contact take place during each quater of the reporting year? No

Number Media Contacts	**Number**
Articles or stories resulting from outreach	900
News releases	6
Newspaper contacts	300
Radio contacts	300
Television contacts	300
Total	**1806**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	**Annual Budget Amount**
Full Budget for Outreach	2000000
Total Amount:	**2000000**

Public Outreah Additional Programs
Public events/booth staffing (68 events with 13,500 people reached, 5000 units of collateral material distributed)

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BMP 2.1 Public Outreach

ON TRACK

Description of all other Public Outreach programs

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2013

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BMP 2.2 School Education Programs **ON TRACK**

152 Los Angeles Dept. of Water and Power **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Metropolitan Water District of SC

Materials meet state education framework requirements? Yes

Guidebook, conservation literature with lessons on water saving.

Materials distributed to K-6? Yes

Teacher received a 60-page lesson package that included lessons on water supply sources, outdoor conservaiton practives as well as a home and school water conservation survey questionnaire.

Materials distributed to 7-12 students? Yes (Info Only)

Teacher received a 60-page lesson package that included lessons on water supply sources, outdoor conservaiton practives as well as a home and school water conservation survey questionnaire.

Annual budget for school education program: 500000.00

Description of all other water supplier education programs

Live Theatre performances called Thirsty City and Thirsty City Jr., includes K-3 and 4-6 age specific water conservation information.

Comments:

At Least As effective As No

Exemption No 0

Urban Water
Management Plan

Appendix I

Emergency Water Conservation Plan

ORDINANCE NO. 184250

An ordinance amending Article I of Chapter XII of the Los Angeles Municipal Code to clarify prohibited uses and modify certain water conservation requirements of the Water Conservation Plan of the City of Los Angeles.

THE PEOPLE OF THE CITY OF LOS ANGELES
DO ORDAIN AS FOLLOWS:

Section 1. Article I of Chapter XII of the Los Angeles Municipal Code is amended in its entirety to read as follows:

ARTICLE I

EMERGENCY WATER CONSERVATION PLAN

SEC. 121.00. SCOPE AND TITLE.

This Article shall be known as The Emergency Water Conservation Plan of the City of Los Angeles.

SEC. 121.01. DECLARATION OF POLICY.

It is hereby declared that because of the conditions prevailing in the City of Los Angeles and in the areas of this State and elsewhere from which the City obtains its water supplies, 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 waste or unreasonable use or unreasonable method of use of water be prevented, and the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interests of the people of the City and for the public welfare.

SEC. 121.02. DECLARATION OF PURPOSE.

The purpose of this Article is to provide a mandatory water conservation plan to minimize the effect of a shortage of water to the Customers of the City and, by means of this Article, to adopt provisions that will significantly reduce the consumption of water over an extended period of time, thereby extending the available water required for the Customers of the City while reducing the hardship of the City and the general public to the greatest extent possible, voluntary conservation efforts having proved to be insufficient.

SEC. 121.03. DEFINITIONS.

The following words and phrases, whenever used in this Article, shall be construed as defined in this section unless from the context a different meaning is intended or unless a different meaning is specifically defined within individual sections of this Article:

a. "**Article**" means the ordinance providing for "**The Emergency Water Conservation Plan of the City of Los Angeles.**"

b. "**Baseline Water Usage**" means the amount of water necessary for existing landscape based on a water budget developed by the Department.

c. "**Billing Unit**" means the unit amount of water used to apply water rates for purposes of calculating commodity charges for Customer water usage and equals one hundred (100) cubic feet or seven hundred forty-eight (748) gallons of water.

d. "**City**" means the City of Los Angeles.

e. "**City Council**" means the Council of the City of Los Angeles.

f. "**Conservation Phase**" means that level of mandatory water conservation presently required from Customers pursuant to this Article.

g. "**Customer**" means any person, persons, association, corporation or governmental agency supplied or entitled to be supplied with water service by the Department.

h. "**Department**" means the Los Angeles Department of Water and Power.

i. "**Drip Irrigation**" means an efficient and targeted form of irrigation in which water is delivered in drops directly to the plants roots where no emitter produces more than four (4) gallons of water per hour.

j. "**Even-numbered**" means street addresses ending with the following numerals: 0 (Zero), 2 (Two), 4 (Four), 6 (Six), 8 (Eight). Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.

k. "**Gray Water**" means a Customer's second or subsequent use of water supplied by the Department on the Customer's premises, such as the use of laundry or bathing water for other purposes.

l. "**Irrigate**" means any exterior application of water, other than for firefighting purposes, dust control, or as process water, including, but not limited to, the watering of any vegetation whether it be natural or planted.

m. "**Large Landscape Area**" means an area of vegetation at least three acres in size supporting a business necessity or public benefit uses such as parks, golf courses, schools and cemeteries.

n. "**Mayor**" means the Mayor of the City of Los Angeles

o. "**Notice to the Department**" means written communication documenting compliance with all requirements and directed to the Department.

p. "**Odd-numbered**" means street addresses ending with the following numerals: 1 (One), 3 (Three), 5 (Five), 7 (Seven), 9 (Nine). Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.

q. "**Officer**" means every person designated in Section 200 of the Los Angeles City Charter as an officer of the City of Los Angeles.

r. "**Potable Water**" means water supplied by the Department which is suitable for drinking and excludes recycled water from any source.

s. "**Private Golf Course**" means a facility with a business license where play is restricted to members and their guests, and does not include personal use facilities such as backyard golf greens or courses.

t. "**Process Water**" means water used to manufacture, alter, convert, clean, heat or cool a product, or the equipment used for such purpose; water used for plant and equipment washing and for transporting of raw materials and products; and water used for community gardens, or to grow trees, plants, or turf for sale or installation.

u. "**Recycled Water**" means water which, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use as approved by the California Department of Public Health.

v. "**Section**" means a section of this Article unless some other ordinance or statute is specifically mentioned.

w. "**Single-Family Residential Customer**" means a customer who is currently subject to Rate Schedule A of the LADWP water rate ordinance.

x. "**Single Pass Cooling Systems**" means equipment where water is circulated only once to cool equipment before being disposed.

y. "**Sports Field**" means a public or private facility supporting a business necessity or public benefit use that provides turf areas as a playing surface for individual and team sports, and does not include a facility on a residential property.

z. "**Station**" means those sprinklers or other water-emitting devices controlled by a single valve.

SEC. 121.04. AUTHORIZATION.

The various officers, boards, departments, bureaus and agencies of the City are hereby authorized and directed to immediately implement the applicable provisions of this Article upon the effective date hereof.

SEC. 121.05. APPLICATION.

The provisions of this Article shall apply to all Customers and property served by the Department wherever situated, and shall also apply to all property and facilities owned, maintained, operated or under the jurisdiction of the various officers, boards, departments, bureaus or agencies of the City.

SEC. 121.06. WATER CONSERVATION PHASES.

A. No Customer of the Department shall make, cause, use or permit the use of water from the Department for any residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Article. The waste or unreasonable use of water is prohibited.

B. For the purposes of this Article, a use of water by a tenant or by an employee, agent, contractor or other acting on behalf of a Customer whether with real or ostensible authority shall be imputed to the Customer. Nothing contained in this Article shall limit the remedies available to a Customer under law or equity for the actions of a tenant, agent, contractor or other acting on behalf of a Customer.

SEC. 121.07. CONSERVATION PHASE IMPLEMENTATION.

A. Notwithstanding any other provisions of this Article, the provisions of Section 121.08A shall take effect immediately upon the effective date of this Article, shall be permanent, and shall not be subject to termination pursuant to the provisions of this Article providing for the termination of a conservation phase.

B. The Department shall monitor and evaluate the projected supply and demand for water by its Customers monthly, and shall recommend to the Mayor and Council by concurrent written notice the extent of the conservation required by the Customers of the Department in order for the Department to prudently plan for and supply water to its Customers. The Mayor shall, in turn, independently evaluate such recommendation and notify the Council of the Mayor's determination as to the particular phase of water conservation, Phase II through Phase VI, that should be implemented. Thereafter, the Mayor may, with the concurrence of the Council, order that the appropriate phase of water conservation be implemented in accordance with the applicable provisions of this Article. Said order shall be made by public proclamation and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The prohibited water uses for each phase shall take effect with the first full billing period commencing on or after the effective date of the public proclamation by the Mayor.

In the event the Mayor independently recommends to the Council a phase of conservation different from that recommended by the Department, the Mayor shall include detailed supporting data and the reasons for the independent recommendation in the notification to the Council of the Mayor's determination as to the appropriate phase of conservation to be implemented.

C. **Phase Termination.**

1. At such time as the Department reports an April 1 forecast of annual Owens Valley and Mono Basin Runoff equal to or exceeding 110 percent of normal and the Metropolitan Water District of Southern California officially states that the sum of its Colorado River and State Water Project supplies exceeds 100 percent of projected demand, the Mayor shall forthwith recommend to the Council the termination of any Customer curtailment phase then in effect. Said recommendation to terminate shall take effect upon concurrence of the Council.

2. The provisions of Subsection C1, above, shall not preclude the Department on the basis of information available to it from recommending to the Mayor the termination of a water conservation phase then in effect. The Mayor shall forward said recommendation to the Council, and it shall take effect upon concurrence by the Council.

SEC. 121.08. WATER CONSERVATION PHASES.

A. **PHASE I – Prohibited Uses Applicable to All Customers.**

1. No Customer of the Department shall use a water hose to wash any paved surfaces, including, but not limited to, sidewalks, walkways, driveways and parking areas, except to alleviate immediate safety or sanitation hazards. This section shall not apply to Department-approved water-conserving spray cleaning devices. Use of water-pressure devices for graffiti removal is exempt. A simple spray nozzle does not qualify as a water-conserving spray cleaning device.

2. No Customer of the Department shall use water to clean, fill or maintain levels in decorative fountains, ponds, lakes or similar structures used for aesthetic purposes unless such water is part of a recirculating system.

3. No restaurant, hotel, café, cafeteria, or other public place where food is sold, served or offered for-sale, shall serve drinking water to any person unless expressly requested.

4. No Customer of the Department shall permit water to leak from any pipe or fixture on the Customer's premises. Failure or refusal to affect a timely repair of any leak of which the Customer knows or has reason to know shall subject said Customer to all penalties provided herein for a prohibited use of water.

5. No Customer of the Department shall wash a vehicle with a hose if the hose does not have a self-closing water shut-off or device attached to it, or otherwise allow a hose to run continuously while washing a vehicle.

6. No Customer of the Department shall irrigate during periods of rain and within 48 hours after a measurable rain event.

7. No Customer of the Department shall water or irrigate lawn, landscape or other vegetated areas between the hours of 9:00 a.m. and 4:00 p.m. During these hours, public and private golf course greens and tees and professional Sports Fields may be irrigated in order to maintain play areas and accommodate event schedules. Supervised testing or repairing of irrigation systems is allowed anytime with proper signage.

8. All irrigating of landscape with potable water using spray head sprinklers and bubblers shall be limited to no more than ten (10) minutes per watering day per station. All irrigating of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than fifteen (15) minutes per cycle and up to two (2) cycles per watering day per station. Exempt from these landscape irrigation restrictions are irrigation systems using very low-flow drip-type irrigation when no emitter produces more than four (4) gallons of water per hour and micro-sprinklers using less than fourteen (14) gallons per hour.

9. No Customer of the Department shall use water in a manner that causes or allows excess or continuous water flow or runoff onto an adjoining sidewalk, driveway, street, gutter or ditch.

10. No installation of single pass cooling systems shall be permitted in buildings requesting new water service.

11. No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.

12. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each bathroom using clear and easily understood language. The Department shall make suitable displays available.

13. No Large Landscape Areas shall have irrigation systems without rain sensors that shut off the irrigation systems. Large Landscape Areas with approved weather-based irrigation controllers registered with the Department are in compliance with this requirement.

B. PHASE II

1. **Prohibited Uses Applicable to All Customers.** Should Phase II be implemented, uses applicable to Phase I of this section shall continue to be applicable, except as specifically provided below.

2. **Non-Watering Days.** No landscape irrigation shall be permitted on any day other than Monday, Wednesday or Friday for odd-numbered street addresses, and Tuesday, Thursday or Sunday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to:

(a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight (8) minutes per watering day per station for a total of 24 minutes per week.

(b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than fifteen (15) minutes per cycle and up to two (2) cycles per watering day per station for a total of 90 minutes per week.

(With the above watering times, water consumption used for both types of nozzles is essentially equal.)

3. Upon written Notice to the Department, irrigation of Sports Fields may deviate from the non-watering days to maintain play areas and accommodate event schedules; however, to be eligible for this means of compliance, a Customer must reduce their overall monthly water use by the Department's Board of Water and Power Commissioners (Board)-adopted degree of shortage plus an additional five percent from the Customer Baseline Water Usage within 30 days.

4. Upon written Notice to the Department, Large Landscape Areas may deviate from the non-watering days by meeting the following requirements: 1) must have approved weather-based irrigation controllers registered with the Department (eligible weather-based irrigation controllers are those approved by the Metropolitan Water District of Southern California or the Irrigation Association Smart Water Application Technologies [SWAT] initiative); 2) must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional five percent from the Customer Baseline Water Usage within 30 days; and 3) must use recycled water if it is available from the Department.

5. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase II except between the hours of 9:00 am and 4:00 pm.

C. PHASE III

1. **Prohibited Uses Applicable to All Customers.** Should Phase III be implemented, uses applicable to Phases I and II of this section shall continue to be applicable, except as specifically provided below.

2. **Non-Watering Days.** No landscape irrigation shall be permitted on any day other than Monday or Friday for odd-numbered street addresses, and Sunday or Thursday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to:

(a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight (8) minutes per watering day per station for a total of 16 minutes per week.

(b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than fifteen (15) minutes per cycle and up to two (2) cycles per watering day per station for a total of 60 minutes per week.

(With the above watering times, water consumption used for both types of nozzles is essentially equal.)

3. Recommend use of pool covers to decrease water loss from evaporation.

4. Recommend washing of vehicles at commercial car wash facilities.

5. Upon written Notice to the Department, irrigation of Sports Fields may deviate from the non-watering days to maintain play areas and accommodate event schedules; however, to be eligible for this means of

compliance, a Customer must reduce their overall monthly water use by the Department's Board-adopted degree of shortage plus an additional five percent from the Customer Baseline Water Usage within 30 days.

6. Upon written Notice to the Department, Large Landscape Areas may deviate from the non-watering days by meeting the following requirements: 1) must have approved weather-based irrigation controllers registered with the Department (eligible weather-based irrigation controllers are those approved by the Metropolitan Water District of Southern California or the Irrigation Association Smart Water Application Technologies [SWAT] initiative); 2) must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional five percent from the Customer Baseline Water Usage within 30 days; and 3) must use recycled water if it is available from the Department.

7. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed every day during Phase III except between the hours of 9:00 am and 4:00 pm.

D. PHASE IV

1. **Prohibited Uses Applicable to All Customers.** Should Phase IV be implemented, uses applicable to Phase I, II, and III of this Section shall continue to be applicable, except as specifically provided below.

2. **Non-Watering Days.** No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street addresses and Tuesday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to:

(a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight (8) minutes per watering day per station for a total of 8 minutes per week.

(b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than fifteen (15) minutes per cycle and up to two (2) cycles per watering day per station for a total of 30 minutes per week.

3. Mandate use of pool covers on all residential swimming pools when not in use.

4. No washing of vehicles allowed except at commercial car wash facilities.

5. No filling of decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes, with potable water.

6. Upon written Notice to the Department, irrigation of Sports Fields may deviate from the specific non-watering days. To be eligible for this means of compliance, a Customer must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional ten percent from the Customer Baseline Water Usage within 30 days.

7. Upon written Notice to the Department, Large Landscape Areas may deviate from the specific non-watering days by meeting the following requirements: 1) must have approved weather-based irrigation controllers registered with the Department (eligible weather-based irrigation controllers are those approved by the Metropolitan Water District of Southern California or the Irrigation Association Smart Water Application Technologies [SWAT] initiative); 2) must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional ten percent from the Customer Baseline Water Usage within 30 days; and 3) must use recycled water if it is available from the Department.

8. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase IV except between the hours of 9:00 a.m. and 4:00 p.m.

E. PHASE V

1. **Prohibited Uses Applicable to All Customers**. Should Phase V be implemented, uses applicable to Phases I, II, III and IV of this section shall continue to be applicable, except as specifically provided below.

2. **Non-Watering Days.** No landscape irrigation allowed.

3. No filling of residential swimming pools and spas with potable water.

4. Upon written notice to the Department, golf courses and professional Sports Fields may apply water to sensitive areas, such as greens and tees, during non-daylight hours and only to the extent necessary to maintain minimum levels of biological viability.

F. PHASE VI

1. **Prohibited Uses Applicable to All Customers.** Phases I, II, III, IV and V of Section 121.08 shall continue to remain in effect.

2. **Additional Prohibited Uses**. The Board is hereby authorized to implement additional prohibited uses of water based on the water supply situation. Any additional prohibition shall be published at least once in a daily newspaper of general circulation and shall become effective immediately upon such publication and shall remain in effect until cancelled.

3. **Penalty Authority**. The Board is hereby authorized to establish appropriate penalties for this phase.

G. **EXCEPTION**. The prohibited uses of water provided for by Subsections A, B, C, D, E and F of this section are not applicable to the uses of water necessary for public health and safety, or for essential government services such as police, fire and other similar emergency services.

H. **VARIANCE.** If, due to unique circumstances, a specific requirement of this Section would result in undue hardship to a Customer using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water uses, then the Customer may apply for a variance from the requirements. Unique circumstances include, but are not limited to, physical disabilities which prevent compliance with the Water Conservation Plan. The Department shall adopt procedures for variance applications, review and decision.

SEC. 121.09. UNREASONABLE USE OF WATER.

It shall be unlawful for any Customer to waste, or engage in the unreasonable use of water. If any Single Family Residential Customer enters the Department's highest rate tier during Phase II-VI, that Customer may be subject to a Water Use Analysis performed by the Department. Department will use available resources, including, but not limited to, water consumption history, land use data, and aerial photographs, to analyze the reasonableness of a Customer's water use.

A. **Notification**. Department may issue a notification to a Customer requesting access to the property for purposes of completing a Water Use Analysis. Within thirty (30) days following written notification by the Department, to the Customer's billing address, the Customer shall provide the Department reasonable access to the property for purposes of completing a Water Use Analysis and for verifying compliance with any existing Customer Conservation Plan.

B. **Cooperation**. Customer, or his designated representative, shall be present and fully cooperate with the Department in the Water Use Analysis, including, but not limited to, providing water use information relating to landscaping, agriculture, fixtures, ponds, cooling towers and other water features and uses located on the property.

C. **Customer Conservation Plan.** Upon completion of the Water Use Analysis, Department may prepare a Customer Conservation Plan that includes an evaluation of all water uses on the property, directions to reduce waste and unreasonable use of water, and a water budget based on the reasonable use of water on the property. Department will discuss with the Customer the findings of the Water Use Analysis and explain the Customer Conservation Plan.

D. The Department shall adopt criteria and process for implementing the Water Use Analysis. When possible the Department will use approved industry standards and methodologies to calculate indoor and outdoor water use.

E. Customer shall comply with all terms of the Department's Customer Conservation Plan, including any water budget provided by Department, and failure to comply shall be deemed an unreasonable use of water that is a threat to public health, safety and welfare and is deemed a nuisance pursuant to Government Code § 38771.

F. **Violation.** Customer failure to (1) provide reasonable access to property following notice, (2) cooperate with Department in the development of a Customer Conservation Plan, or (3) comply with Customer Conservation Plan shall be deemed a new violation of this section, and shall be noticed by the Department by written citation. Violation of this section shall subject Customer to penalties as described in Section 121.10(A)(3).

SEC. 121.10. FAILURE TO COMPLY.

A. **Penalties.** It shall be unlawful for any Customer of the Department to fail to comply with any of the provisions of this Article. Notwithstanding any other provision of the Los Angeles Municipal Code, the penalties set forth herein shall be exclusive and not cumulative with any other provisions of this Code. The penalties for failure to comply with any of the provisions of this Article shall be as follows:

1. Violations of any of the provisions of Subsection A, B, C, D, E, and F of Section 121.08 during the preceding twelve (12) calendar months, shall result in imposition of an administrative civil penalty pursuant to Penalty Schedule A and shall be included on the Customer's regular water bill issued by the Department.

Penalty Schedule A

Water meter smaller than two (2") inches						
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**
1st Written Warning	$0	$0	$0	$0	$0	Board Authority
2nd Written Violation	$50	$100	$200	$300	$400	Board Authority
3rd Written Violation	$100	$200	$400	$600	$800	Board Authority
4th Written Violation	$150	$300	$600	$900	$1200	Board Authority

Water meter two (2") inches and larger						
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**
1st Written Warning	$0	$0	$0	$0	$0	Board Authority
2nd Written Violation	$100	$200	$400	$600	$800	Board Authority
3rd Written Violation	$200	$400	$800	$1200	$1600	Board Authority
4th Written Violation	$300	$600	$1200	$1800	$2400	Board Authority

(a) After a fifth or subsequent violation, the Department may install a flow-restricting device of one-gallon-per-minute (1 GPM) capacity for services up to one and one-half inch (1-1/2") size and comparatively sized restrictors for larger services or terminate a Customer's service, in addition to the financial surcharges provided for herein. Such action shall be taken only after a hearing held by the Department where the Customer has an opportunity to respond to the Department's information or evidence that the Customer has repeatedly violated this Article or Department rules regarding the conservation of water and that such action is reasonably necessary to assure compliance with this Article and Department rules regarding the conservation of water.

Any such restricted or terminated service may be restored upon application of the Customer made not less than 48 hours after the implementation of the action restricting or terminating service and only upon a showing by the Customer that the Customer is ready, willing and able to comply with the provisions of this Article and Department rules regarding the conservation of water. Prior to any restoration of service, the Customer shall pay all Department charges for any restriction or termination of service and its restoration as provided for in the

Department's rules governing water service, including, but not limited to, payment of all past due bills and fines.

2. Violations of Section 121.09 shall result in imposition of administrative civil penalties pursuant to Penalty Schedule B and shall be included on the Customer's regular water bill issued by the Department:

Penalty Schedule B

Number of Consecutive Months with Violation	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Violation during months 1-5	N/A	$1,000	$2,000	$5,000	$10,000	Board Authority
Violation during months 6-11	N/A	$2,000	$4,000	$10,000	$20,000	Board Authority
Violation during months 12-17	N/A	$3,000	$6,000	$15,000	$30,000	Board Authority
Violation during months 18-23	N/A	$4,000	$8,000	$20,000	$40,000	Board Authority

(a) Customers continuing to violate Section 121.09 beyond 24 months will be referred to the Board for consideration of flow restrictors or other actions.

C. **Notice**. The Department shall give notice of each violation to the Customer committing such violation as follows:

1. For any violation of the provisions of Section 121.08 and 121.09, the Department may give written notice of the fact of such violation to the Customer personally, by posting a notice at a conspicuous place on the Customer's premises or by United States mail, First-Class, postage prepaid, addressed to the Customer's billing address.

2. If the penalty assessed is, or includes, the installation of a flow restrictor or the termination of water service to the Customer, notice of the violation shall be given in the following manner:

(a) By giving written notice thereof to the Customer personally;

or

(b) If the Customer is absent from or unavailable at either their place of residence or place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail, First Class postage prepaid, addressed to the Customer at their place of business, residence or such other address provided by the Customer for bills for water or electric service if such can be ascertained; or

(c) If such place of residence, business or other address cannot be ascertained, or a person of suitable age or discretion at any such place cannot be found, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring, and also by delivering a copy to a person of suitable age and discretion there residing or employed, if such person can be found, and also sending a copy through the United States mail, First Class, postage prepaid, addressed to the Customer at the place where the property is situated, as well as such other address provided by the Customer for bills for water or electric service if such can be ascertained.

Said notice shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and statement informing the Customer of their right to a hearing on the violation.

D. **Hearing and Appeal**. Any Customer who disputes any penalty levied pursuant to this Section shall have a right to a dispute determination conducted pursuant to the Department's Rules Governing Water and Electric Service. Any Customer dissatisfied with the Department's dispute determination may appeal that determination within 15 days of issuance to the Board or to a designated hearing officer at the election of the Board. The provisions of Sections 19.24, 19.25, 19.26 and Sections 19.29 through 19.39 of the Los Angeles Administrative Code shall apply to such appeals. All defenses, both equitable and legal, may be asserted by a Customer in the appeal process. The decisions of the Board shall become final at the expiration of 45 calendar days, unless the Council acts within that time by a majority vote to bring the action before it or to waive review of the action. If the Council timely asserts jurisdiction, the Council may, by a majority vote, amend, veto or approve the action of the Board within 21 calendar days of voting to bring the matter before it, or the action of the Board shall become final. If the City Council asserts jurisdiction over the matter and acts within 21 calendar days of voting to bring the matter before it, the City Council's action shall be the final decision.

E. **Public Disclosure.** Any violation of any section of this Ordinance shall be subject to disclosure under the California Public Records Act.

F. **Reservation of Rights.** The rights of the Department hereunder shall be cumulative to any other right of the Department to discontinue service. All monies collected by the Department pursuant to any of the surcharge provisions of this Article shall be collected for water conservation purposes consistent with this Ordinance.

SEC. 121.11. GENERAL PROVISIONS.

A. **Enforcement.** The Department of Water and Power, through a designee of the General Manager, shall enforce the provisions of this Article. At any time, Department may use technology that will assist staff in observing water use of customers and enforcing the ordinance. Technology may be used for, but not limited to, evidence of an ordinance violation and as justification for issuing any penalties.

B. **Department to Give Effect to Legislative Intent.** The Department shall provide water to its Customers in accordance with the provisions of this Article and in a manner reasonably calculated to effectuate the intent hereof.

C. **Public Health and Safety Not to be Affected.** Nothing contained in this Article shall be construed to require the Department to curtail the supply of water to any Customer when, in the discretion of the Department, such water is required by that Customer to maintain an adequate level of public health and safety, provided further that a Customer's use of water to wash the Customer's property immediately following the aerial application of a pesticide, such as Malathion, shall not constitute a violation of this Article.

D. **Recycled Water and Gray Water.** The provisions of this Article shall not apply to the use of Recycled Water or Gray Water, provided that such use does not result in excess water flow or runoff onto the adjoining sidewalk, driveway, street, gutter or ditch. This provision shall not be construed to authorize the use of Gray Water if such use is otherwise prohibited by law.

E. **Large Landscape Areas.** Large Landscape Areas that have multiple irrigation system stations can deviate from prescribed non-watering days if their systems include weather-based irrigation controllers, and each irrigation station is limited to the number of days prescribed in Section 121.08.

F. **Hillside Burn Areas.** The provisions of this Article shall not apply to hillside areas recovering from fire that have been replanted for erosion control. To qualify for this exemption, a Customer must obtain verification from the agency requiring erosion control measures. The duration of the exemption is limited to either one growing cycle, one year, or establishment of the vegetation, whichever is the lesser time period.

SEC. 121.12. SEVERABILITY.

If any section, subsection, clause or phrase in this Article or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of the Article or the application of such provision to other persons or circumstances shall not be affected thereby. The City Council hereby declares that it would have passed this Article and each section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or the application thereof to any person or circumstance be held invalid.

Sec. 2. **URGENCY CLAUSE.** The Council of the City of Los Angeles hereby finds and declares that there exists within this City a current water shortage and the likelihood of a continuing water shortage into the immediate future and that as a result there is an urgent necessity to take legislative action through the exercise of the police power to protect the public peace, health and safety of this City from a public disaster or calamity. Therefore, this ordinance shall take effect immediately upon publication.

Sec. 3. The City Clerk shall certify to the passage of this ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that this ordinance was passed by the Council of the City of Los Angeles, **by a vote of not less than three-fourths** of all its members, at its meeting of APR 1 9 2016.

HOLLY L. WOLCOTT, City Clerk

By ______ Deputy

Approved 4/25/16

______ Mayor

Approved as to Form and Legality

MICHAEL N. FEUER, City Attorney

By ______ for
DAVID EDWARDS
Deputy City Attorney

Date 4/1/16

File No. 15-0540

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