

**Central Basin**  
Municipal Water District



Design & Consultancy  
for natural and  
built assets

**2015**

# **URBAN WATER MANAGEMENT PLAN**

**FINAL DRAFT**

May 2016

## 2015 URBAN WATER MANAGEMENT PLAN

Central Basin Municipal Water District

**FINAL DRAFT**

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- D Adopted UWMP Resolution
- E Gateway Regional Water Conservation Alliance Report
- F Water Supply Allocation Plan
- G CUWCC BMP Report



## ACRONYMS AND ABBREVIATIONS

20 x 2020	20% water use reduction in GPCD by year 2020
Act	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet per Year
ARRA	American Reinvestment and Recovery Act
BMP	Best Management Practice
CAP	Conservation Awareness Program
CCIC	central Computer Irrigation Controller
Central Basin	Central Basin Municipal Water District
CFS	Cubic Feet per Second
CII	Commercial/Industrial/Institutional
CIP	Capital Improvement Program
CMP	Conservation Master Plan
CMP	Conservation Monitoring Program
CRA	Colorado River Aqueduct
CTC	Cooling Tower Controller
CTCC	Cooling Tower Conductivity Controller
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
Delta	Sacramento-San Joaquin River Delta
DOE	Department of Energy
DVL	Diamond Valley Lake
DWR	Department of Water Resources
EOC	Emergency Operation Center
ETo	Evapotranspiration
FY	Fiscal Year
Gateway IRWM	Gateway Integrated Regional Water Management
GCM	General Circulation Model
GPCD	Gallons per Capita per Day
GRIP	Groundwater Reliability Improvement Program
GWMA	Gateway Integrated Regional Water Management Authority
HELP	High Efficiency Living Program
HET	High Efficiency Toilets
IPR	Indirect Potable Reuse
IRP	Integrated Water Resource Plan
JWPCP	Joint Water Pollution Control Plant
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District

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LACSD	Los Angeles County Sanitation District
LRP	Local Resources Program
M & I	Municipal and Industrial
MAF	Million Acre-Feet
MAFY	Million Acre-Feet per Year
Main Basin	Main San Gabriel Groundwater Basin
MAIN	Municipal and Industrial Needs
Metropolitan	Metropolitan Water District of Southern California
MGD	Million Gallons per Day
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
RTS	Readiness-to-Serve
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCADA	Supervisory Control and Data Acquisition System
SCAG	Southern California Association of Governments
SMSS	Soil Moisture Sensor System
Study	Colorado River Basin Water Supply and Demand Study
SWP	State Water Project
SWRCB	California State Water Resources Control Board
UWMP	Urban Water Management Plan
W.E.T.	Water Education Tours
WBIC	Weather Based Irrigation Controller
WQPP	Water Quality Protection Program
WRD	Water Replenishment District of Southern California
WRP	Water Reclamation Plant
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management Plan
WUE	Water Use Efficiency

# 1 INTRODUCTION

## 1.1 Purpose and UWMP Summary

Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act) require every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare, adopt, and file an Urban Water Management Plan (UWMP) with the California Department of Water Resources (DWR) every five years in the years ending in zero and five. The 2015 UWMP updates are due to DWR by July 1, 2016.

This UWMP provides DWR with a detailed summary of present and future water resources and demands within the Central Basin Municipal Water District (Central Basin) service area and assesses its water resource needs. Specifically, the UWMP provides water supply planning for a 25-year planning period in five-year increments and identifies water supplies needed to meet existing and future demands. The demand analysis must identify supply reliability under three hydrologic conditions: a normal year, a single-dry year, and multiple-dry years. Central Basin's 2015 UWMP updates the 2010 UWMP in compliance with the requirements of the Act as amended in 2009, and includes a discussion of:

- Water Service Area and Facilities
- Water Sources and Supplies
- Water Use by Customer Type
- Demand Management Measures
- Water Supply Reliability
- Planned Water Supply Projects and Programs
- Water Shortage Contingency Plan
- Recycled Water Use

Since the original Act's passage in 1983, several amendments have been added. The most recent changes affecting the 2015 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. SBx7-7, or the Water Conservation Act of 2009, is part of the Delta Action Plan that stemmed from the Governor's goal to achieve a 20 percent statewide reduction in urban per capita water use by 2020 (20 x 2020). Reduction in water use is an important part of this plan that aims to sustainably manage the Bay Delta and reduce conflicts between environmental conservation and water supply; it is detailed in Section 3.3.1. SBx7-7 requires each urban retail water supplier to develop urban water use targets to achieve the 20 x 2020 goal and the interim ten percent goal by 2015. Each urban retail water supplier must include in its 2015 UWMPs the following information from its target-setting process:

- Baseline daily per capita water use
- 2020 urban water use target
- 2015 interim water use target compliance

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- Compliance method being used along with calculation method and supporting data
- An implementation plan to meet the targets

Wholesale water suppliers such as Central Basin are required to include an assessment of present and proposed future measures, programs, and policies that would help achieve the 20 percent water use reduction by 2020 goal.

The sections in this UWMP correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of Central Basin. The UWMP Checklist which identifies the location of Act requirements in this Plan is included in Appendix A. This is an individual UWMP for a wholesale agency, as shown in Tables 1-1 and 1-2. Table 1-2 also indicates the units that will be used throughout this document.

Table 1-1: Plan Identification

Plan Identification			
Select Only One	Type of Plan		Name of RUWMP or Regional Alliance
<input checked="" type="checkbox"/>	Individual UWMP		
	<input type="checkbox"/>	Water Supplier is also a member of a RUWMP	
	<input checked="" type="checkbox"/>	Water Supplier is also a member of a Regional Alliance	Gateway Regional Alliance
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

Table 1-2: Agency Identification

Agency Identification	
Type of Agency	
<input checked="" type="checkbox"/>	Agency is a wholesaler
<input type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year	
<input type="checkbox"/>	UWMP Tables Are in Calendar Years
<input checked="" type="checkbox"/>	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	
Unit	AF
NOTES:	

## 1.2 Urban Water Management Plan Update Preparation

This section provides the information required in Article 3 of the Water Code related to adoption and implementation of the UWMP. Central Basin's 2015 UWMP revises the 2010 UWMP prepared by Central Basin and incorporates changes enacted by legislation over the last five years. The UWMP also incorporates water use efficiency efforts Central Basin has implemented pursuant to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). Central Basin was one of the first agencies to become signatory to the MOU in September 1991.

### 1.2.1 Plan Adoption

The 2015 UWMP was adopted by a resolution of Central Basin's Board of Directors on DATE 2016 (Appendix D) following a public hearing on DATE 2016. The hearing provided an opportunity for all residents in the service area to learn and ask questions about their water supply and Central Basin's plans. As shown in Table 1-3, Central Basin sent a Letter of Notification to all cities within its service area on DATE, 2016 to state that it was in the process of preparing an updated UWMP (Appendix C).

By July 1, 2016, the Adopted 2015 Central Basin UWMP was filed with DWR, California State Library, County of Los Angeles, and cities within Central Basin's service area. Central Basin will make the plan available for public review no later than 30 days after filing with DWR.

Table 1-3: Notifications to Cities and Counties

Wholesale: Notification to Cities and Counties	
<input checked="" type="checkbox"/>	Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642. Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.
Table 1-4	Provide the page or location of this list in the UWMP.

## 1.2.2 Agency Coordination

A notice of adoption of Central Basin's 2015 UWMP was prepared and sent to the Metropolitan Water District of Southern California (Metropolitan), the County of Los Angeles, along with local cities and water agencies at least 60 days before the formal adoption date. The notice of adoption is included in Appendix C.

Central Basin's 2015 UWMP was completed by consultants in coordination with Central Basin, Central Basin's customer water agencies, and Metropolitan. Table 1-4 provides an overview of the coordination and the participation of local cities and agencies. Central Basin submitted this plan in draft form to the cities and retail agencies during the spring of 2016 for review and comment. Since most of the cities and agencies need to prepare their own UWMP's, Central Basin staff provided historical water use and conservation data that they were able to use in their own plans.

Table 1-4: Central Basin Public and Agency Coordination

Public and Agency Coordination				
Coordinating Agencies	Sent 60 Day Notification	Sent Copy of Draft Plan	Commented on Draft Plan	Attended Public Hearing
Artesia, City of				
Bell Gardens, City of				
Bell, City of				
Bellflower Home & Garden Water Company				
Bellflower, City of				
Bellflower-Somerset Mutual Water Company				
California Water Service Company				
Carson, City of				
Cerritos, City of				
Commerce, City of				
Compton, City of				

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Public and Agency Coordination				
Coordinating Agencies	Sent 60 Day Notification	Sent Copy of Draft Plan	Commented on Draft Plan	Attended Public Hearing
County of Los Angeles				
Cudahy, City of				
Downey, City of				
Golden State Water Company				
Hawaiian Gardens, City of				
Huntington Park, City of				
La Habra Heights County Water District				
La Mirada, City of				
LAC Department of Regional Planning				
Lakewood, City of				
Liberty Utilities				
Long Beach, City of				
Lynwood Park Mutual Water Company				
Lynwood, City of				
Maywood Mutual Water Co. #1				
Maywood Mutual Water Co. #2				
Maywood Mutual Water Co. #3				
Maywood, City of				
Metropolitan Water District of Southern California				
Montebello Land & Water Company				
Montebello, City of				
Monterey Park, City of				
Norwalk, City of				
Orchard Dale Water District				
Paramount, City of				
Pico Rivera, City of				

## 2015 URBAN WATER MANAGEMENT PLAN

Public and Agency Coordination				
Coordinating Agencies	Sent 60 Day Notification	Sent Copy of Draft Plan	Commented on Draft Plan	Attended Public Hearing
Pico Water District				
Rancho Los Amigos - LAC				
San Gabriel Valley Water Company				
Sanitation Districts of Los Angeles County				
Santa Fe Springs, City of				
Sativa L.A. County Water District				
Signal Hill, City of				
South Gate, City of				
South Montebello Irrigation District				
Suburban Water Systems				
Tract 180 Mutual Water Company				
Tract 349 Mutual Water Company				
Upper San Gabriel Municipal Water District				
Vernon, City of				
Walnut Park Mutual Water Company				
Water Replenishment District of Southern California				
Whittier, City of				

Central Basin is a wholesale water agency and purchases its potable supplies from Metropolitan and its recycled water from the Los Angeles County Sanitation Districts (LACSD) to distribute within and outside its service area. This UWMP details the specifics as they relate to the Central Basin service area and will refer to Metropolitan throughout the document. Metropolitan held several UWMP information meetings for stakeholders and the public throughout its service area during 2015.

The 2015 UWMP is intended to serve as a general, flexible and open-ended document that periodically can be updated to reflect changes in the region's water supply trends as well as conservation and water use efficiency policies. This UWMP, along with Central Basin's other planning documents, will be used by Central Basin staff to guide the service area's water use and management efforts through the year 2020, when the next UWMP update is due.



## 1.3 Central Basin Municipal Water District

### 1.3.1 Background

Central Basin was established by a vote of the people in 1952 to provide access to imported water as an alternative to groundwater. Central Basin joined Metropolitan in 1954 to purchase, on a wholesale level, imported potable water for resale to the local municipalities, investor-owned and mutual water companies and water districts. As a water supplier, Metropolitan provides the Southern California region with a reliable supply of imported water. Central Basin remains one of the larger member agencies of Metropolitan's wholesalers.

Central Basin wholesales potable water to cities, mutual water companies, investor-owned utilities, water districts and private water companies in the region. In addition, Central Basin supplies recycled water to the region for municipal, commercial and industrial use. Central Basin supplies imported and recycled water to its customer agencies to help protect the Central Groundwater Basin and develop a more diversified portfolio of water supplies.

Central Basin is governed by a five member Board of Directors elected from within the service area. Each Director serves a four-year term once elected. The Board of Directors guides the mission and policy of Central Basin. In addition, Central Basin's Board of Directors appoints two representatives to serve on the 38-member Metropolitan Board of Directors. Central Basin's representation on the Metropolitan Board is critical to shaping a regional voice on water issues.

### 1.3.2 Central Basin Service Area

Central Basin's service area, shown on Figure 1-1, covers approximately 227 square miles and includes 24 cities and several unincorporated areas in southeast Los Angeles County. Central Basin maintains a population of approximately 1.6 million people according to the Southern California Area Governments (SCAG), however, due to the undercounting of the area's immigrant population, the population is considered to be closer to 2 million. Central Basin is broken up into five distinct political divisions with the residents of each division voting for a representative to the Board of Directors. The cities and their associated divisions include

#### **Division 1:**

Bell Gardens, Downey, Montebello, Pico Rivera, West Whittier/Los Nietos, and unincorporated areas of Los Angeles County.

#### **Division 2:**

La Habra Heights, La Mirada, Norwalk, Santa Fe Springs, Whittier and South Whittier.

#### **Division 3:**

Bell, Commerce, Cudahy, Huntington Park, Maywood, Walnut Park, Monterey Park, Vernon and unincorporated areas of East Los Angeles.

#### **Division 4:**

Lynwood, South Gate, Florence-Graham, Willowbrook, and portions of Compton and Carson.

**Division 5:**

Artesia, Bellflower, Cerritos, Hawaiian Gardens, Lakewood, Paramount, Signal Hill, and unincorporated county area in Long Beach.

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## 2015 URBAN WATER MANAGEMENT PLAN

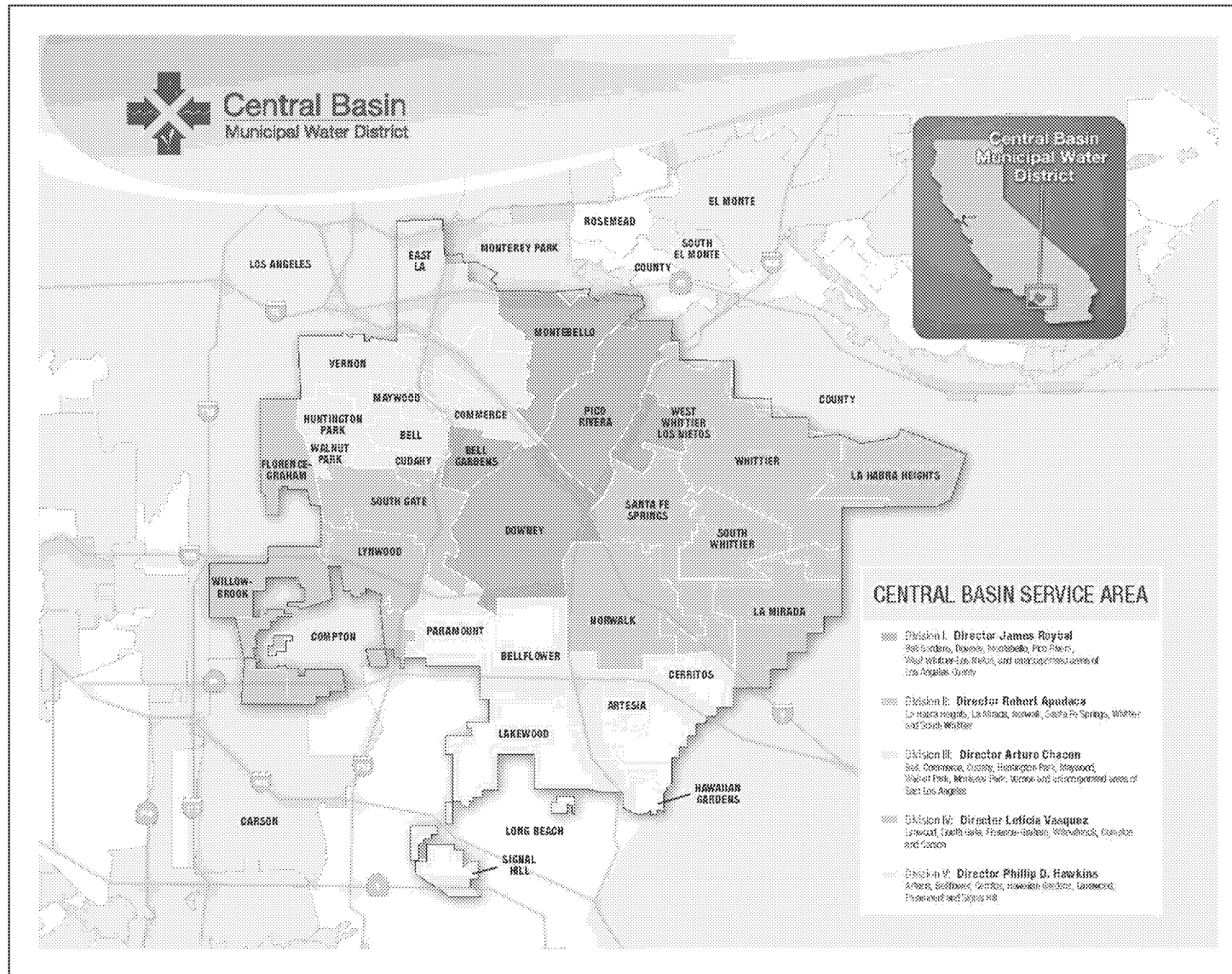


Figure 1-1: Central Basin Service Area (As of July 2016)

Table 1-5 summarizes the water suppliers that have been informed of the available water supplies through sending each a draft of the UWMP.

Table 1-5: Water Supplier Information Exchange

Wholesale: Water Supplier Information Exchange	
<input checked="" type="checkbox"/>	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed.
Table 1-4	Provide page number for location of the list.

### 1.3.3 Relationship to Metropolitan

Central Basin is one of 26 member agencies of Metropolitan. Metropolitan was formed as a wholesale water agency to distribute imported water via the Colorado River Aqueduct and the northern California State Water Project to its member agencies. In 1954, Central Basin joined Metropolitan as a wholesale water district to sell imported water to its local retail water agencies.

#### 1.3.3.1 Representation on the Metropolitan Board of Directors

Metropolitan maintains a Board of Directors of 38 representatives, each of which are appointed by the governing bodies of the 26 member agencies. Each member agency of Metropolitan receives one directorship. Additionally, member agencies receive another directorship for each five percent of the agency's assessed valuation. Currently, Central Basin is valued at 5.17 percent of the total Metropolitan service area, and therefore receives two directorships on the Metropolitan Board, one as a member agency and the second for having more than five percent of assessed valuation.

## 2 WATER DEMANDS

### 2.1 Overview

Since the last Urban Water Management Plan update, southern California's urban water demand landscape has been largely shaped by the efforts to comply with SBx7-7. This law requires all of California's retail urban water suppliers serving more than 3,000 acre-feet per year (AFY) or 3,000 service connections to achieve a 20 percent reduction in demands (from a historical baseline) by 2020. In 2010 the Gateway Integrated Regional Water Management Authority (GWMA) was formed between Central Basin and 15 cities and agencies within the Gateway region of Los Angeles. This Alliance created flexibility for members in meeting the water use reduction targets required under SBx7-7. All members of the Alliance have been actively engaged in efforts to reduce water use in their service areas to meet the 2015 interim 10 percent reduction and the 2020 final water use target. Meeting this target is critical to ensure that Central Basin and all Gateway Alliance members are eligible to receive future state water grants and loans.

In April 2015, Governor Brown issued an Emergency Drought Mandate as a result of one of the most severe droughts in California's recorded history, requiring a collective reduction in statewide urban water use of 25 percent by February 2016. In response to the Governor's mandate, Central Basin's retail agencies are carrying out more aggressive conservation efforts and implementing higher stages of their water conservation ordinances to achieve the demand reduction goal set by the mandate.

Water conservation efforts have been employed by Central Basin, retail agencies, and members of the Gateway Alliance to meet the 2015 interim target and 2020 target for water use reduction as explained above. Central Basin has supported local water conservation ordinances and activities within each of its customers and alliance members, and has expanded its own Conservation Monitoring Program. Water conservation programs include:

- High Efficiency Clothes Washer Program
- High Efficiency Toilet Direct Delivery Program
- HELP HET Multi-family Direct Installation Program
- Outdoor Large Landscape Water Saving Performance Program
- Metropolitan's SoCal WaterSmart Residential Incentive Program
- Metropolitan's Commercial Incentive Program
- Commercial HET Direct Installation Program
- Urban City Makeover Program
- Demonstration Gardens

These efforts have been part of statewide water conservation ordinances which have limited watering landscape, serving water in restaurants and bars, and reducing the amount of laundry done by hotels. Further discussion on Central Basin's water conservation ordinance is covered in Section 4 Water Shortage

Contingency Plan of this UWMP. The individual retail agencies and Gateway Alliance members have developed UWMPs which will further detail their individual efforts.

Section 2 delves into the current water demands in Central Basin's service area by use, and projections of water demands and conditions for the next 20 years. In addition, to satisfy SBx7-7 requirements, this section will provide details of Central Basin's SBx7-7 compliance method selection with the Gateway Alliance, baseline water use calculation, and its 2015 and 2020 water use targets.

## **2.2 Factors Affecting Demand**

Demand for water in Central Basin's service area is dependent on many factors. Local climate conditions and the evolving hydrology, demographics, land use characteristics, and economics of the region are key factors affecting demand within the service area. In addition to local factors, the watersheds of California's imported water are experiencing drought conditions that are impacting available and future water supplies.

### **2.2.1 Climate Characteristics**

Central Basin is located within the South Coast Air Basin (SCAB) that encompasses urban and unincorporated areas of Los Angeles County. The SCAB climate is characterized by a "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall.

The average temperature ranges from 69.4°F in January to 89.7°F in August. Annual precipitation averages 15.38 inches, occurring mostly between November and March. The average evapotranspiration (ET<sub>o</sub>) is about 42.87 inches per year, which is almost three times the annual average rainfall. This translates to high demand for landscape irrigation of homes, commercial properties, parks, and golf courses.

Average annual ET<sub>o</sub>, temperatures and rainfall are shown in Table 2 1.

Table 2-1: Monthly Average Climate Characteristics

Monthly Average Climate Data Summary			
Month	Standard Monthly Average ETo (inches) [1]	Average Total Rainfall (inches) [2]	Average Temperature (degrees Fahrenheit) [3]
January	1.89	3.56	69.4
February	2.15	3.91	71.1
March	3.52	3.06	72.8
April	4.39	0.90	77.8
May	4.70	0.23	79.4
June	4.75	0.07	83.7
July	5.24	0.02	88.6
August	5.27	0.02	89.7
September	4.35	0.02	87.9
October	3.05	0.03	82.6
November	1.95	1.23	75.4
December	1.61	1.88	70.9
Annual	42.87	15.38	79.1

[1] CIMIS Station #174, Long Beach, California from October 1987 to Present

[2] NOAA, Montebello Station, California 1979 to 2005, Mean Precipitation Total

[3] NOAA, Montebello Station, California 1979 to 2005, Mean Temperature

Local rainfall has limited impacts on reducing demand for Central Basin. Water that infiltrates into the soil may enter groundwater supplies depending on the local geography. However, due to significant impervious cover in Southern California, rainfall runoff flows to a system of concrete storm drains and channels that lead directly to the ocean. The Los Angeles County Department of Public Works (LACDPW) operates stormwater capture and replenishment activities at the San Gabriel River Spreading Grounds and Rio Hondo Spreading Grounds which contribute to the Central Groundwater Basin. Replenishment of the Central Groundwater Basin occurs through recycled water and untreated imported water managed by the Water Replenishment District of Southern California (WRD).

Metropolitan's water supplies come from the State Water Project (SWP) and the Colorado River Aqueduct (CRA), influenced by climate conditions in northern California and the Colorado River Basin, respectively. Both regions have been suffering from multi-year drought conditions with record low precipitation which directly impact water supplies to southern California.

## 2.2.2 Demographics

Central Basin's service area encompasses 227 square miles in southeast Los Angeles County, which includes cities, water agencies, water districts, publicly-owned mutual water companies and publicly regulated utilities. This service area includes some of the most densely populated areas in Los Angeles County. The SCAG 2012 Regional Transportation Plan provides a comprehensive analysis of demographic information for the Central Basin service area. Based on these projections, population is expected to increase 12 percent by 2040, representing an average growth rate of 2 percent per year. Table 2-2 shows Central Basin's service area population projections in five-year increments to 2040.

Table 2-2: Population – Current and Projected

<b>Wholesale: Population - Current and Projected</b>						
Population Served	2015	2020	2025	2030	2035	2040
	1,565,128	1,603,549	1,632,666	1,691,205	1,722,317	1,757,232
NOTES: From Metropolitan Demand Projection Data						

## 2.3 Water Use by Customer Type

Retail agency water consumption can be projected by understanding the type of use and customer type creating the demand. Developing local water use profiles on the retail level helps agencies to identify quantity of water used, and by whom within the Central Groundwater Basin. As a wholesale water agency, Central Basin purchases imported water from Metropolitan and sells directly to retail agencies comprised of cities, mutual water companies, publicly regulated utilities and water districts. Additionally, Central Basin provides replenishment water for the Water Replenishment District to augment groundwater supplies within its boundaries.

The average retail agency in Central Basin's service area relies on groundwater production for 70 percent of its water supply, while some agencies rely exclusively on groundwater to meet water demands.

### 2.3.1 Sales to Other Agencies

Central Basin is a water wholesaler to agencies comprised of cities, mutual water companies, publicly regulated utilities and water districts. Each of these agencies sell drinking water at the retail level to residential, industrial, and commercial customers. Table 2-3 contains a summary of Central Basin's total potable water demand in the fiscal year (FY) 2014-15 within its service area.



Table 2-3: Demands for Potable and Raw Water - Actual (AF)

<b>Wholesale: Demands for Potable and Raw Water - Actual</b>			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Sales to other agencies	Retail Agencies	Drinking Water	30,344
Groundwater recharge	WRD	Raw Water	18,500
Other	GW Production	Drinking Water	165,563
Other	GW Recovery/WQPP	Drinking Water	2,571
<b>TOTAL</b>			<b>216,978</b>
NOTES: Central Basin Consumptive Data FY 14-15. GW Production includes Central Basin and Main Basin production.			

Table 2-4 shows the potable demands broken down by retail agency with an imported water service connection.

## 2015 URBAN WATER MANAGEMENT PLAN

Table 2-4: Potable Demands by Agency - Actual (AF)

Agency Breakdown		
2015 Actual		
	Level of Treatment When Delivered	Volume
Bell Gardens, City of	Drinking Water	243
Bellflower-Somerset Mutual Water Company	Drinking Water	1
California Water Service Company - Commerce	Drinking Water	347
California Water Service Company - East L.A.	Drinking Water	7,577
Cerritos, City of	Drinking Water	652
Downey, City of	Drinking Water	0
Huntington Park, City of	Drinking Water	1,232
La Habra Heights County Water District	Drinking Water	283
Lakewood, City of	Drinking Water	0
Lynwood, City of	Drinking Water	15
Maywood Mutual Water Company #1	Drinking Water	105
Maywood Mutual Water Company #2	Drinking Water	0
Maywood Mutual Water Company #3	Drinking Water	0
Montebello, City of	Drinking Water	1,163
Norwalk, City of	Drinking Water	271
Orchard Dale Water District	Drinking Water	0
Paramount, City of	Drinking Water	584
Liberty Utilities (Formerly Park Water Company)	Drinking Water	7,163
Rancho Los Amigos - Los Angeles County	Drinking Water	0
San Gabriel Valley Water Company	Drinking Water	0
Santa Fe Springs, City of	Drinking Water	3,273
Signal Hill, City of	Drinking Water	337
Golden State Water Company	Drinking Water	6,041
South Gate, City of	Drinking Water	0
Suburban Water Systems	Drinking Water	23
Vernon, City of	Drinking Water	1,034
Walnut Park Mutual Water Company	Drinking Water	0
Water Replenishment District	Raw Water	18,500
		48,844

## 2.4 Demand Projections

Demand projections were developed by Metropolitan for each member agency based on available data as well as land use, population and economic growth. Projections were developed representing three levels of supply availability: 1) average year water year 1922-2004, 2) single year water year 1977, and 3) multi-year drought conditions from water year 1990-92. The baseline demand projection was selected as the average water year from 1922-2004 per Metropolitan. Supply and demand analyses for the single- and

multi-year drought cases were based on conditions affecting the SWP; Metropolitan determined the SWP to be the appropriate point of reference since this supply varies the most with hydrologic conditions (Metropolitan, 2015 Final Draft UWMP, February 2016).

### 2.4.1 Demand Projection Methodology

Central Basin has used Metropolitan's demand projections developed for each member agency. Metropolitan developed its demand forecast by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation. Projections of local supplies then were derived using data from current and expected local supply programs and the Integrated Water Resources Plan (IRP) Local Resources Program Target. The resulting difference between total demands net of conservation and local supplies is the expected regional demands on Metropolitan supplies. (Metropolitan, 2015 Final Draft UWMP, February 2016). The major categories used to develop projections are:

- Retail Municipal and Industrial (M&I) Demand
- Replenishment Demand

Conservation savings were included from a baseline year of 1990, and include code-based conservation, active conservation and passive conservation that are described in Section 5.

### 2.4.2 25 Year Projections

A key component of the 2015 UWMP is to provide insight into the Central Basin service area's future water demand outlook. Central Basin works in collaboration with its retail agencies as well as Metropolitan, its wholesaler, to develop demand projections imported water. Groundwater pumping rights have remained the same in compliance with allowable groundwater pumping rights since the Central Groundwater Basin underwent an adjudication process in the early 1960's. Groundwater production will remain consistent due to the limited amount of extractable pumping rights within the basin, while recycled water and conserved water will meet the rise in demand. Metropolitan projects a decrease in reliance on imported water due to increased local supply and a variety of water conservation strategies. Table 2-5 shows a projection of Central Basin's water demand for the next 25 years.

Table 2-5: Demands for Potable and Raw Water - Projected (AF)

Wholesale: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description	Projected Water Use				
		Report To the Extent that Records are Available				
		2020	2025	2030	2035	2040
Sales to other agencies	Retail Agencies/WRD	64,354	61,560	60,133	57,957	57,661
Other	GW Production	182,300	182,300	182,300	182,300	182,300
Other	GW Recovery/WQPP	3,995	4,567	5,139	5,711	5,807
<b>TOTAL</b>		<b>250,649</b>	<b>248,427</b>	<b>247,572</b>	<b>245,968</b>	<b>245,768</b>
NOTES: Metropolitan Demand Projection, 2015 UWMP and 2-year demand average						

The above demand values were provided by Metropolitan and reviewed by Central Basin as part of the UWMP effort. Central Basin works in collaboration with each of its retail agencies and Alliance members as well as Metropolitan, its wholesaler, to develop imported water demand projections. Metropolitan projects a decrease in reliance on imported water due to increased local supply and a variety of water conservation strategies. The per capita water use is developed in Section 2.5.

### 2.4.3 Total Water Demand Projections

Metropolitan developed projections for its member agencies that include average year, single dry year and multiple dry years. The methodology used to determine demand forecasting is a combination of historical water use analysis, population growth and commercial and residential development. Central Basin, with the assistance of Metropolitan's forecasting model is able to develop some well formulated water demand projections.

Based on the information provided above, the total demand for potable water is listed below in Table 2-6. Use of recycled water is projected to increase within the service area.

Table 2-6: Total Water Demands (AF)

<b>Wholesale: Total Water Demands</b>						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	216,978	250,649	248,427	247,572	245,968	245,768
Recycled Water Demand	54,567	53,910	58,171	61,423	62,667	63,911
<b>TOTAL WATER DEMAND</b>	<b>271,545</b>	<b>304,559</b>	<b>306,598</b>	<b>308,995</b>	<b>308,635</b>	<b>309,679</b>
NOTES:						

### 2.4.4 Groundwater Replenishment Demands

Replenishment water is defined as water that is used to refill or protect the groundwater basin. The WRD purchases imported and recycled water, as supplemental water for replenishing the Central Groundwater Basin.

Storm water is also used for replenishment. The diversion of storm water into the Rio Hondo and San Gabriel River Spreading Grounds is managed by LACDPW.

Imported and recycled water can be delivered to the Montebello Forebay Spreading Grounds, located in Pico Rivera and Montebello.

## 2.5 SBx7-7 Requirements

In February 2008, the California legislature introduced a seven part comprehensive plan for improving the Sacramento-San Joaquin Delta. As part of that effort, several state agencies were directed to develop a plan to reduce per capita water use state wide by 20 percent by the year 2020. Legislation titled the "Water Conservation Act of 2009" (SBx7-7) enacted the 20 x 2020 concept. As part of the 20 x 2020 plan, all retail water agencies in the state are required to detail how they plan to achieve the mandatory reductions through their UWMP. Retail water agencies who have either 3,000 or more connections or provide 3,000 AF or more of water per year, are required to be in compliance with SBx7-7 either individually, as part of an

alliance, demonstrate they have a plan or have secured funding to be in compliance, in order to be eligible for water related state grants and loans on and after July 16, 2016.

As a wholesale agency, Central Basin is not required to establish and meet baseline and targets for daily per capita water use. However, it is required to provide an assessment of its present and proposed future measures, programs and policies that will help its retail water suppliers achieve their SBx7-7 water use reduction targets. The Gateway Integrated Regional Water Management (Gateway IRWM) group which includes retail water agencies within Central Basin's service area has formed the Gateway Regional Water Conservation Alliance with the goal to meet SBx7-7 requirements as a region. Section 2.5.3.1 describes the regional alliance in more detail. The Gateway Regional Water Conservation Alliance Report is provided in Appendix E.

### **2.5.1 Statewide Target**

In response to the 20 x 2020 plan, in February 2010, DWR set the statewide baseline water use at 192 gallons per capita per day (GPCD) based on the statewide average urban water usage and population in 2005. However, this number can be misleading because it represents different hydrological regions across the state that have urbanized populations and highly variable climatic conditions that influence water use. Using that number as the baseline, the state must reduce per capita water demand to 173 GPCD by 2015 as the interim target and 154 GPCD by 2020 to meet the final state-wide target.

### **2.5.2 Regional Target**

In the South Coast hydrological region (which incorporates the Central Basin service area as well as all of the Metropolitan service area), the average urban water usage in 2005 was 180 gpcd. Based on the criteria for establishing a target number, the baseline for the South Coast Region is 171 gpcd (which is 95 percent of established target reductions). With this baseline in mind, the South Coast region's interim target for 2015 is 154 gpcd and the final target for 2020 is 137 gpcd.

### **2.5.3 Gateway IRWM and Regional Alliance**

In February 2011, the Gateway IRWM group formed a "regional alliance" to develop a regional plan to meet the interim 2015 and 2020 targets as indicated in SBx7-7 for retail water agencies in the Gateway IRWM. The Gateway regional alliance consists of 15 participating retail water agencies as shown in Table 2-7. Some of the Central Basin retail water agencies chose not to participate in the regional alliance because they are not required to submit an UWMP or they chose to comply with the SBx7-7 requirements individually.

Table 2-7: Gateway Regional Alliance Participating Agencies

Gateway Regional Alliance	
Bellflower-Somerset Mutual Water Company	City of Bell Gardens
City of Downey	City of Lakewood
City of Long Beach	City of Lynwood
City of Norwalk	City of Paramount
City of Pico Rivera	Pico Water District
City of Santa Fe Springs	City of Signal Hill
City of South Gate	City of Vernon
City of Whittier	

### 2.5.3.1 Regional Water Use Targets

SBx7-7 requires that a 2020 Target and 2015 Interim Target for individual agencies be calculated using one of the four methods below:

- **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 use, landscaped area water use, and commercial, industrial and institutional (CII) uses.
- **Method 3:** Ninety-five percent of the applicable state hydrologic region target.
- **Method 4:** Calculated savings of metering currently unmetered water connections and achieving water conservation measures in three water use sectors.

The regional water use targets can be calculated using one of three options described in the 2015 UWMP Guidebook. These options are listed below:

- **Option 1:** A population-weighted average. A target is calculated for an individual urban water supplier, using any method described above, and for any baseline period (ending between December 31, 2004 and December 31, 2010). An agency's target is then multiplied by the ratio of that agency's population to the total population. Summing the resulting values from all participating agencies yields the Regional 2020 Target.
- **Option 2 and Option 3:** An aggregate of individual agency water use and population information. There are slight differences between Option 2 and Option 3, but they can be similarly described. The water use and population information is summed for all participating agencies, and the regional base daily per capita water use is calculated for each year. The 10-year or 15-year baseline is calculated for the region, and one of the four methods described above is applied to obtain the 2020 Target.

Multiple Method-and-Option combinations were analyzed to calculate a 2020 Target that would best suit the Gateway Regional Alliance. While the Gateway Regional Alliance elected to calculate the 2020 Target using Option 1 with Method 1 and Method 3. The individual retail agencies baseline and water target and the resulting regional water use targets can be found in Appendix E.

The Gateway Regional Alliance has determined it is in compliance with its 2015 interim urban water use target as summarized in Table 2-9.

Table 2-8: Gateway Regional Alliance Baseline 2015 Compliance

[To be updated at a later date]

### 2.5.3.2 Assessment of Present and Future Measures

In the past five years, Central Basin has completed several conservation state and federal grants: Helping our People and Environment Program will save at least 1,089 AF of water within 20 years, High Efficiency Living Program will save at least 4,820 AF of water within 20 years. Lastly, the Water and Energy Emergency End Use Demand Management Measures Project is expected to save 1,360 AF of water within 20 years. These three grants represent the aggressive approach taken by Central Basin to conserve potable water before the state declaration was announced.

Central Basin also partnered with various agencies to promote conservation rebates. They were Golden State Water Company, San Gabriel Valley Water Company and Park Water Company (recently renamed to Liberty Utilities), Suburban Water Systems and the City of South Gate. Central Basin also trained city staffers on how to respond to the drought and hosted drought gardening classes to meet the regions 20 x 2020 goal and current state mandates for water conservation.

In the next five years, Central Basin will be implementing more retrofits on publicly owned properties such as parks and schools. This will be made possible by the Department of Water Resources Prop 50 Grant called the Water Conservation/Management and Education Program and the Prop 84 grant called the Southeast Water Efficiency Program. Central Basin will continue its conservation rebate partnership and gardening classes.

The actual water use in the region is 109 GPCD, 1.5 percent lower than the 2015 target which is indicative of the collective efforts of Central Basin and retail agencies that formed the Gateway regional alliance to reduce water use in the region.

## 2.6 Projected Water Demands

One of the objectives of this UWMP is to project Central Basin's demand for the next 25 years. Forecasting water use is an important element in planning future water supplies. The methodology used in demand forecasting is a combination of historical water use analysis, population growth, and commercial and residential development. With the assistance of Metropolitan's forecasting model known as MWD-MAIN (Municipal and Industrial Needs) Water Use Forecasting System, Central Basin is able to develop well formulated water demand projections.

The MWD-MAIN forecasting model determines expected urban water usage for the next 25 years. To project water demands, this model incorporates census data, industrial growth, employment and regional

development from regional planning agencies, such as SCAG. It also features demands in sectors such as single family, multifamily, industrial, commercial and institutional usage for the region. Metropolitan also takes into account current and future water management efforts, such as water conservation Best Management Practices (BMPs) and education programs.

Retail imported water demand in Central Basin is expected to decrease by 22 percent by 2040. Groundwater will remain consistent, due to the limited amount of extractable pumping rights within the Central Groundwater Basin, while recycled water and conserved water will increase during the next 25 years with additional supplies and customers.

### 2.6.1 Projected Per Capita

Per capita water demand is determined from the water use divided by the population. The future “per capita” use shows that water demand will remain relatively constant regardless of the population increases expected over the next 25 years as shown in Table 2-9.

Table 2-9: Water Supply Efficiency in the Central Basin Service Area

Year	Estimated Population (Millions) <sup>1</sup>	Retail Water Usage (AF) <sup>2</sup>	Per Capita (GPCD)
2020	1.604	225,827	126
2025	1.633	224,849	123
2030	1.691	225,238	119
2035	1.722	224,879	117
2040	1.757	225,923	115
		<b>Average</b>	120
Notes: 1) From Metropolitan Demand Projection Data. 2) Does not include replenishment sales.			



## 3 WATER SUPPLIES

### 3.1 Overview

It is Central Basin's mission to ensure a safe, adequate and reliable water supply for the region it serves. Historically, retail water agencies in Central Basin relied completely on groundwater. Today, their water supply portfolios are more diverse, relying on a combination of groundwater, imported water, and recycled water. It has been projected that by 2040, the region will depend less on imported water, with increased local water resources, recycled water development, and conservation programs.

This section provides an overview of Central Basin's current and future water supplies needed to meet the expected demands including: a review of the current and projected water supplies, description of current water sources for Central Basin's retail agencies, and planned and/or developing future supplies to meet future demands.

### 3.2 Central Basin's Water Supply Portfolio

Since 1952, Central Basin has provided its retail agencies with supplemental supplies to reliably meet their demands. Diversification is key to a reliable future water supply. Central Basin's retail agencies plan to continue diversification of their water resources over the next 25 years with recycled water system expansions along with increased conservation efforts including groundwater storage opportunities. Central Basin's dependence on imported sources will continue to decrease with the expansion of these alternative sources. Figure 3-1 shows the projected water supply portfolio within Central Basin's service area.

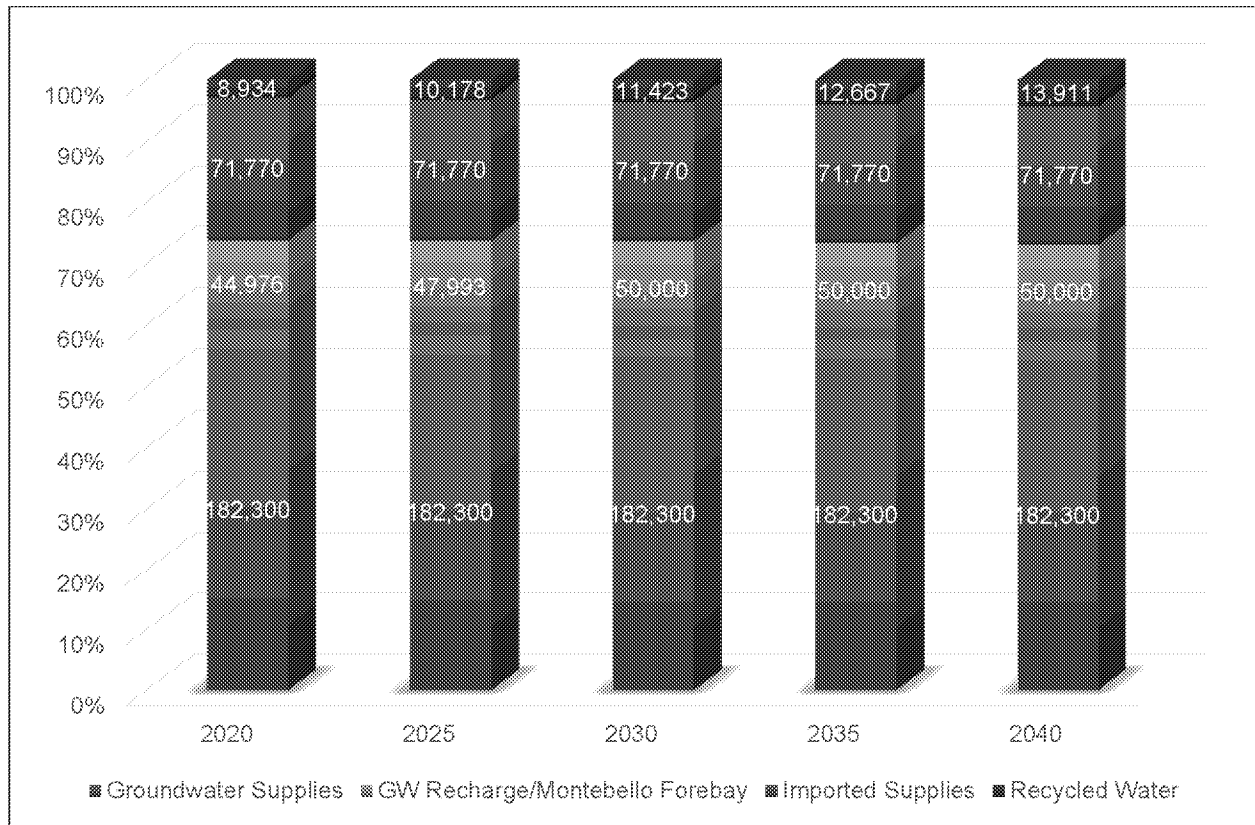


Figure 3-1: Central Basin Projected Water Supply Sources (AF)

### 3.3 Central Basin Sources

#### 3.3.1 Imported Water Supply

Central Basin currently supplies approximately 30,344 AFY of imported water from Metropolitan's CRA and DWR's SWP to its retail agencies.

The CRA is owned and operated by Metropolitan and includes supplies from the implementation of the Quantification Settlement Agreement and related agreements to transfer water from agricultural agencies to urban uses. The 2003 Quantification Settlement Agreement enabled California to implement major Colorado River water conservation and transfer programs, stabilizing water supplies for 75 years and reducing the state's demand on the river to its 4.4 million acre-feet (MAF) entitlement (San Diego County Water Authority, Quantification Settlement Agreement). Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis. Metropolitan has a basic entitlement of 550,000 AFY of Colorado River water plus a priority for up to an additional 662,000 AFY. Metropolitan can obtain additional water under this priority when the U.S. Secretary of the Interior determines that one or both of the following conditions exists (Metropolitan, 2015 Final Draft UWMP, February 2016):

- Surplus water is available

- Colorado River water is apportioned to but unused by Arizona and/or Nevada

The Colorado River faces current and future imbalances between water supply and demand in the Colorado River Basin due to long-term drought conditions. The long-term imbalance in future supply and demand is projected to be approximately 3.2 MAF by 2060. Between 2000 and 2015 there were only three years when the Colorado River flow has been above average (Metropolitan, 2015 Final Draft UWMP, February 2016).

Approximately 40 million people rely on the CRA and its tributaries for water with 5.5 million acres of land using Colorado River water for irrigation. Climate change will also affect future supply and demand as increasing temperatures may increase evapotranspiration from vegetation and water loss due to evaporation in reservoirs. This will reduce the supply available from the CRA resulting in gaps between demands and supplies.

Four water supply scenarios were developed around these uncertainties, each representing possible water supply conditions as follows:

- **Observed Resampled:** future hydrologic trends and variability are similar to the past approximately 100 years.
- **Paleo Resampled:** future hydrologic trends and variability are represented by reconstructions of streamflow for a much longer period in the past (approximately 1,250 years) that show expanded variability.
- **Paleo Conditioned:** future hydrologic trends and variability are represented by a blend of the wet-dry states of the longer paleo-reconstructed period.
- **Downscaled General Circulation Model (GCM) Projected:** future climate will continue to warm, with regional precipitation and temperature trends represented through an ensemble of future downscaled GCM projections.

The Colorado River Basin Water Supply and Demand Study (Study) assessed the historical water supply in the Colorado River Basin through two historical streamflow data sets, from 1906 through 2007 and the paleo-reconstructed record from 762 through 2005. The following are findings from the study:

- A warming trend in both the Upper and Lower Colorado River Basins since the 1970s has been observed and is consistent with North American global trends.
- Loss of springtime snowpack was observed with consistent results across the lower elevation northern latitudes of the western United States. The large loss of snow at lower elevations strongly suggest the cause is due to shifts in temperature.
- The deficit between the two year running average flow and the long-term mean annual flow that started in the year 2000 is more severe than any other deficit in the observed period, at nine years and 28 MAF deficit.
- There are deficits of greater severity from the longer paleo record compared to the period from 1906 through 2005. One deficit amounted to 35 MAF through a span of 16 years.
- A summary of the trends from the observed period suggest declining stream flows, increases in variability, and seasonal shifts in streamflow that may be related to shifts in temperature.

Findings concerning the future projected supply were obtained from the Downscaled GCM Projected scenario as the other methods did not consider the impacts of a changing climate beyond what has occurred historically. These findings include:

- Warming is projected to increase across the Colorado River Basin with larger changes in the Upper Basin than in the Lower Basin. Annual Basin-wide average temperature is projected to increase by 1.3 degrees Celsius over the period through 2040.
- Projected seasonal trends toward drying are significant in certain regions. A general trend towards drying is present in the Colorado River Basin, although increases in precipitation are projected for some higher elevation and hydrologically productive regions. Consistent and expansive drying conditions are projected for the spring and summer months throughout the Colorado River Basin, although some areas in the Lower Basin are projected to experience slight increases in precipitation, which is thought to be attributed to monsoonal influence in the region. Upper Basin precipitation is projected to increase in the fall and winter, and Lower Basin precipitation is projected to decrease.
- Snowpack is projected to decrease due to precipitation falling as rain rather than snow and warmer temperatures melting the snowpack earlier. Areas where precipitation does not change or increase is projected to have decreased snowpack in the fall and early winter. Substantial decreases in spring snowpack are projected to be widespread due to earlier melt or sublimation of snowpack.
- Runoff (both direct and base flow) is spatially diverse, but is generally projected to decrease, except in the northern Rockies. Runoff is projected to increase significantly in the higher elevation Upper Basin during winter but is projected to decrease during spring and summer.

The following future actions must be taken to implement solutions and help resolve the imbalance between water supply and demand in areas that use Colorado River water (U.S. Department of the Interior Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study, December 2012):

- Resolution of significant uncertainties related to water conservation, reuse, water banking, and weather modification concepts
- Costs, permitting issues, and energy availability issues relating to large capacity augmentation projects need to be identified and investigated
- Opportunities to advance and improve the resolution of future climate projections should be pursued
- Consideration should be given to projects, policies, and programs that provide a wide-range of benefits to water users and healthy rivers for all users

### **State Water Project**

The SWP is operated by DWR and is an integral part of the effort to ensure business and industry, urban and suburban residents, and farmers throughout a majority of California have sufficient water. The SWP is the largest state-built, multipurpose, user-financed water project in the United States. Nearly two-thirds of residents in California receive at least part of their water from the SWP with approximately 70 percent of SWP's contracted water supply going to urban users and 30 percent to agricultural users. The primary purpose of the SWP is to divert and store water during wet periods in Northern and Central California and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and Southern California.

The Sacramento-San Joaquin River Delta (Delta) is key to the SWP's ability to deliver water to its agricultural and urban contractors. 24 of the 29 SWP contractors receive water deliveries below the Delta (pumped via the Harvey O. Banks or Barker Slough pumping plants). However, the Delta faces many challenges concerning its long-term sustainability such as climate change posing a threat of increased variability in floods and droughts. Sea level rise complicates efforts in managing salinity levels and preserving water quality in the Delta to ensure a suitable water supply for urban and agricultural use. Furthermore, other challenges include continued subsidence of Delta islands, many of which are below sea level, and the related threat of a catastrophic levee failure as the water pressure increases, or as a result of a major seismic event.

The availability of SWP supplies can be highly variable. A wet water year may be followed by a dry or critically dry year. Ongoing regulatory restrictions, such as those imposed by federal biological opinions on the effects of SWP and the federal Central Valley Project (CVP) operations on certain marine life, also contributes to the challenge of determining the SWP's water delivery reliability. In below average conditions, Metropolitan has increased the supplies delivered through the California Aqueduct by developing flexible CVP/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry year supplies that can be conveyed through the available Harvey O. Banks pumping plant capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. In addition, the California State Water Resources Control Board (SWRCB) has set water quality objectives that must be met by the SWP including minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity level.

Metropolitan's Board approved a Delta Action Plan in June 2007 that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta Action Plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Delta while a long-term solution is implemented. Currently, Metropolitan is working towards addressing three basin elements: Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development.

"Table A" water is the maximum entitlement of SWP water for each water contracting agency. Currently, the combined maximum Table A amount is 4.17 million acre-feet per year (MAFY) with 4.13 MAFY as the maximum Table A water available for delivery from the Delta.

SWP contractors may receive Article 21 water on a short-term basis in addition to Table A water if requested. Article 21 water is used by contractors to help meet demands when allocations are less than 100 percent.

Carryover water is SWP water allocated to an SWP contractor and approved for delivery to the contractor in a given year but not used by the end of the year. The unused water is stored in the SWP's share of San Luis Reservoir, when space is available, for the contractor to use in the following year.

Turnback pool water is Table A water that has been allocated to SWP contractors and has exceeded their demands. This water can then be purchased by another contractor depending on its availability.

SWP Delta exports are the water supplies that are transferred directly to SWP contractors or to San Luis Reservoir storage south of the Delta via the Harvey O. Banks pumping plant. Estimated average annual Delta exports and SWP Table A water deliveries have generally decreased since 2005, when Delta export

regulations affecting SWP pumping operations became more restrictive. Estimated average annual Delta exports have decreased since 2005 from 2.96 MAFY to 2.61 MAFY in 2013, a decrease of 346,000 AF or 11.7 percent. Average annual Table A deliveries have decreased from 2.82 MAFY in 2005 to 2.55 MAFY in 2013, a decrease of 265,000 AF or 9.4 percent. Total historical SWP deliveries, including Table A water, Article 21 water, turnback pool water, and carryover water, range from 1.36 to 3.73 MAFY, with an average of 2.72 MAFY between 2003 and 2012.

The following factors affect the ability to estimate existing and future water delivery reliability:

- **Water availability at the source:** Availability depends on the amount and timing of rain and snow that fall in any given year. Generally, during a single dry year or two, surface and groundwater storage can supply most water deliveries, but multiple dry years can result in critically low water reserves.
- **Water rights with priority over the SWP:** Water users with prior water rights are assigned top priority in DWR's modeling of the SWP's water delivery reliability, even ahead of SWP Table A water.
- **Climate change:** mean temperatures are predicted to increase both globally and regionally. This change in climate is anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing total snowpack. From historical data, DWR projects that by 2050, the Sierra snowpack will be reduced from its historical average by 25 to 40 percent. Increased precipitation as rain could result in a larger number of "rain-on-snow" events, causing snow to melt earlier in the year and over fewer days than historically, affecting the availability of water for pumping by the SWP during summer.
- **Regulatory restrictions on SWP Delta exports:** there are various regulatory requirements placed on SWP's Delta operations in order to protect special-status species such as delta smelt and spring- and winter-run Chinook salmon. Restrictions on SWP operations imposed by state and federal agencies contribute substantially to the challenge of accurately determining the SWP's water delivery reliability in any given year.
- **Ongoing environmental and policy planning efforts:** California WaterFix involves water delivery upgrades that could reduce salinity levels by diverting a greater amount of lower salinity Sacramento water to the South Delta export pumps. The EcoRestore Program aims to restore at least 30,000 acres of Delta habitat, and plans to be well on the way to meeting that goal by the year 2020.
- **Delta levee failure:** The levees are vulnerable to failure because most original levees were simply built with soils dredged from nearby channels and were not engineered. A breach of one or more levees and island flooding could affect Delta water quality and SWP operations for several months. When islands are flooded, DWR may need to drastically decrease or even cease SWP Delta exports to evaluate damage caused by salinity in the Delta.

The Delta Risk Management Strategy addresses the problem of Delta levee failure and evaluates alternatives to reduce the risk to the Delta. Four scenarios were developed to represent a range of possible risk reduction strategies (Natural Resources Agency Department of Water Resources, The State Water Project Final Delivery Capability Report 2015, July 2015) that include:

- **Trial Scenario 1 Improved Levees:** This scenario looks at improving the reliability of Delta levees against flood-induced failures by providing up to 100-year flood protection. The report found that improved levees would not reduce the risk of potential water export interruptions, nor would it change the seismic risk of most levees.

- **Trial Scenario 2 Armored Pathway:** This scenario looks at improving the reliability of water conveyance by creating a route through the Delta that has high reliability and the ability to minimize saltwater intrusion into the south Delta. The report found that this scenario would have the joint benefit of reducing the likelihood of levee failures from flood events and earthquakes, and of significantly reducing the likelihood of export disruptions.
- **Trial Scenario 3 Isolated Conveyance:** This scenario looks to provide high reliability for conveyance of export water by building an isolated conveyance facility on the east side of the Delta. The effects of this scenario are similar to those for Trial Scenario 2 but with the added consequence of seismic risk of levee failure on islands that are not part of the isolated conveyance facility.
- **Trial Scenario 4 Dual Conveyance:** This scenario is a combination of Scenarios 2 and 3 as it looks to improve reliability and flexibility for conveyance of export water by constructing an isolated conveyance facility and a through-Delta conveyance. It would avoid the vulnerability of water exports associated with Delta levee failure and offer flexibility in water exports from the Delta and the isolated conveyance facility. However, seismic risk would not be reduced on islands not part of the export conveyance system or infrastructure pathway.

### Types of Imported Supplies

Metropolitan offers a variety of imported water supplies to its member agencies. Depending on the ultimate use, Central Basin has delivered Non-Interruptible Water (treated full service), Seasonal Treated Replenishment Water, and Seasonal Untreated Replenishment Water. Non-Interruptible Water is the treated firm supply that is available all year. It is used as the main supplemental supply for cities and water agencies.

Seasonal Storage Long Term, also known as “In-Lieu” water, is Metropolitan supplied water bought to replace water that would otherwise be pumped from groundwater basins. This program incentivizes customer agencies to take surplus imported water which indirectly replenishes the Central Groundwater Basin. This surplus water is purchased at a discount rate in exchange for leaving groundwater in the Central Groundwater Basin for no less than one year so that it can be used subsequently during dry years (Metropolitan, 2015 Draft UWMP, February 2016).

Seasonal Spreading, better known as replenishment water, is delivered to the San Gabriel River and Rio Hondo Spreading Grounds in the Montebello Forebay. Replenishment water does not require treatment and is generally provided during the wet season months (October through April), which allows for it to be purchased at a discounted rate. WRD purchases imported replenishment water from Central Basin to replenish the Central Groundwater Basin. Metropolitan’s replenishment program has been discontinued and WRD purchases replenishment water under Tier 1 Untreated rates).

### 3.3.2 Groundwater Supply

Groundwater has for many years been the primary supply of water within Central Basin’s service area. The Central Groundwater Basin is predominately comprised of a confined, pressurized aquifer system, with two large unconfined merged aquifer forebays, the Montebello Forebay and the Los Angeles Forebay. Twelve aquifers underlie the Central Groundwater Basin.

The Montebello Forebay in the northeast corner of the basin straddles the San Gabriel River and the Rio Hondo (a tributary of the Los Angeles River) at the point where they emit from the Whittier Narrows. The Montebello Forebay lies directly downstream of the San Gabriel Valley.

The Los Angeles Forebay straddles the Los Angeles River. Due to the concrete lining of the Los Angeles River and the lack of spreading facilities, only minor amounts of water are recharged into the Central Groundwater Basin through the Los Angeles River system.

The Central Groundwater Basin is adjudicated and based upon Watermaster services under two Court Judgements: The Third Amended Central Basin Judgement, managed by the Central Basin Water Rights Panel and the Long Beach Judgement, which is managed by the San Gabriel River Watermaster.

### **Long Beach Judgment - San Gabriel River Watermaster**

Entered in 1965, the Long Beach Judgment provides an adjudication of Upper and Lower Areas on the San Gabriel River supply through Whittier Narrows and is administered by the court appointed San Gabriel River Watermaster. The water supply of the San Gabriel River System is divided at Whittier Narrows, the boundary between San Gabriel Valley upstream and Los Angeles County downstream. The area downstream from Whittier Narrows receives a quantity of water from the San Gabriel River system. This includes water exported to the Lower Area, usable surface flow and subsurface flow at Whittier Narrows. The San Gabriel River Watermaster monitors and reviews activities affecting water supply in the river system, performs operational repairs as deemed necessary and compiles data to determine usable water and make-up water. Four agencies that include the Upper San Gabriel Valley Municipal Water District, Central Basin, the City of Long Beach and the City of Compton rely on the San Gabriel River Watermaster to cover hydrologic analyses, data collection, field inspection, report calculations, conservancy and master planning.

### **Third Amended Central Basin Judgement – Central Basin Water Rights Panel**

The production of groundwater from the Central Basin underwent adjudication in the early 1960's, which developed an allowable pumping allocation at 217,367 AFY. In 2014, a Third Amended Judgement was enacted, which allowed development of a Central Basin Water Rights Panel to govern issues pertaining to parties with groundwater pumping rights. The Third Amended Judgement also established the Water Replenishment District as the new Watermaster, which replaced the California Department of Water Resources in the prior role.

Some water purveyors within Central Basin's service area have groundwater pumping rights and do not purchase imported water, however, they benefit indirectly through groundwater replenishment of imported water.



### **Water Replenishment District of Southern California**

In 1959, the State Legislature enacted the Water Replenishment Act, enabling water associations to secure voter approval for the formation of the “Central and West Basin Water Replenishment District” (now called WRD). WRD is responsible for acquiring sufficient revenues through an assessment on the amount of water pumped from the West and Central Groundwater Basins in order to replenish supplies within its boundaries (WRD, An Introduction to the Central and West Coast Groundwater Basins, 2005).

### **Groundwater Rights**

Since the Central Groundwater Basin underwent an adjudication process in the early 1960's the total amount of allowable extraction rights have remained the same. Some of the parties with groundwater pumping rights are located outside of Central Basin's service area.

### **Main San Gabriel Groundwater Basin**

Although most of the groundwater supply is extracted from the Central Groundwater Basin, there are a number of water retailers that retain groundwater rights within the Main San Gabriel Groundwater Basin (Main Basin) that are extracted and used within their Central Basin service area. The Main Basin underlies most of the San Gabriel Valley, north of the Central Groundwater Basin. It is bounded by the San Gabriel Mountains to the north, the San Jose Hills to the east, the Puente Hills to the south and by the Raymond Fault and a series of other hills to the west. Surface area of the Main Basin is approximately 167 square miles and has a fresh water storage capacity estimated to be about 8.6 million AF.

The total amount of water extracted from the Main Basin and used within the Central Basin service area over the last five years averages to approximately 31,500 AFY. The total amount of groundwater produced in the Central Groundwater Basin and the Main Basin has remained fairly consistent over the last five years. This is due mainly to the fact that both basins are adjudicated, so groundwater extractions in any given year are limited. The economic costs to pump groundwater versus the purchase of imported water will continue to pressure water retailers to maximize their groundwater rights (Metropolitan, 2015 Final Draft UWMP, February 2016).

### **Groundwater Recharge**

For the past 78 years, the Central Groundwater Basin has been artificially replenished through the San Gabriel River and Rio Hondo Spreading Grounds, which were constructed by the Los Angeles County Flood Control District (LACFCD) and are owned and operated by LACDPW. WRD purchases imported water (replenishment or Tier I untreated) from Central Basin and recycled water from LACSD for use in the spreading grounds where it percolates into the Montebello Forebay of the Central Groundwater Basin. Tables 3-1 and 3-2 shows the actual sources and volume of water and projected sources and volume of water that Central Basin provides to its retail agencies respectively.

Table 3-1: Water Supplies, Actual (AF)

<b>Wholesale: Water Supplies — Actual</b>			
Water Supply	Additional Detail on Water Supply	<b>2015</b>	
		Actual Volume	Water Quality
Purchased or Imported Water	Retail Agencies	30,344	Drinking Water
Purchased or Imported Water	WRD	18,500	Raw Water
Other	GW Production	165,563	Drinking Water
Recycled Water	Municipal, Industrial, and Agricultural Use	7,647	Recycled Water
Other	GW Recharge/Montebello Forebay	46,920	Recycled Water
<b>Total</b>		<b>268,974</b>	
NOTES:			

## 2015 URBAN WATER MANAGEMENT PLAN

Table 3-2: Water Supplies, Projected (AF)

Wholesale: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>				
		2020	2025	2030	2035	2040
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	Metropolitan	71,770	71,770	71,770	71,770	71,770
Other	GW Production	182,300	182,300	182,300	182,300	182,300
Recycled Water	Municipal, Industrial, and Agricultural Use	8,934	10,178	11,423	12,667	13,911
Other	GW Recharge/Montebello Forebay	44,976	47,993	50,000	50,000	50,000
<b>Total</b>		307,980	312,241	315,493	316,737	317,981
NOTES: Purchased imported water includes potable and replenishment						

By statute, WRD assesses a groundwater production fee, a “Replenishment Assessment,” to pumpers in the Central Groundwater Basin. The assessment provides funds for WRD to purchase imported water and recycled water to replenish the groundwater supply. The available replenishment supply to recharge the basins can be classified as follows (WRD, Engineering Survey and Report, May 2015):

- **Local water:** Consists of precipitation from the San Gabriel River, Rio Hondo River and other waterways within the San Gabriel Valley and underflow obligations of the San Gabriel River Judgment.
- **Recycled water:** Consists of recycled water purchased from LACSD through Central Basin for delivery at the Montebello Forebay Spreading Grounds.
- **Imported water:** Consists of untreated imported water purchased from Central Basin for delivery at the Rio Hondo Spreading Grounds. WRD also encourages in-lieu replenishment of the Central Groundwater Basin. Under the In-Lieu program, pumpers are encouraged through a financial incentive to purchase surplus imported water from Central Basin “in-lieu” of pumping groundwater. However, the incentive program is dependent on the availability of discount replenishment water from Metropolitan.

### 3.3.3 Recycled Water Supply

Recycled water is widely accepted as a water supply source throughout Central Basin’s service area. It is used to augment local supplies and reduce dependence on imported water. Recycled water supplies demands for non-potable applications such as landscape irrigation and commercial and industrial processes. Chapter 7 provides a detailed description of Central Basin’s water recycling program.

## 3.4 Future Supply Projects

Water transfers and exchanges are management tools to address increased water needs in areas of limited supply. Although transfers and exchanges do not generate a new supply of water, they help distribute water from where it is abundant to where it is limited.

Metropolitan has played an active role statewide in securing water transfers and exchanges as part of their IRP goals in both the Colorado River Basin and along the SWP. As a member agency of Metropolitan, Central Basin is the beneficiary of such transfers and exchanges.

### 3.4.1 Desalination

Desalination is typically used to treat brackish groundwater or ocean water to drinking water quality and requires treatment using reverse osmosis. Typical salt content in ocean water is over 35,000 milligrams per liter (mg/L) and the California Code of Regulation Title 22 requires the secondary maximum contaminant level for total dissolved solids in drinking water to be below 500 mg/L, with an upper limit of 1,000 mg/L and a short term limit of 1,500 mg/L. Brackish groundwater is groundwater with a salinity higher than freshwater, but lower than that of ocean water.

#### 3.4.1.1 Groundwater

There are no sources of brackish groundwater in Central Basin’s service area that could potentially serve as a water source for desalination.

### 3.4.1.2 Ocean Water

The Central Basin service area is land locked so there is no direct access to the ocean making construction of an ocean desalination facility infeasible. Regionally there are active seawater barrier operations to prevent seawater intrusion, but they are not within Central Basin's service area. Ocean desalination may provide neighbouring agencies with a new supply source, but Central Basin will not be investing in ocean desalination in the near future due to the high energy costs associated with operation and the lack of accessibility.

## 3.5 Supply Reliability

### 3.5.1 Overview

Water reliability is among the future challenges of continued urbanization in Southern California. Since 2010, Southern California water agencies have been subject to imported water curtails from the Delta and by the imposition of an allocation plan to reduce imported water deliveries to member agencies of Metropolitan. This section discusses the future reliability of water sources that Central Basin purchases from Metropolitan as well as local sources of water that Central Basin's retail agencies depend.

## 3.6 Metropolitan Water Supply Reliability

Metropolitan has undertaken numerous planning initiatives to ensure water supply reliability having experienced the historical droughts of 1977-78, 1987-92, 2007-09, and the current drought that include: the IRP, the Water Surplus and Drought Management Plan (WSDM), the Water Supply Allocation Plan (WSAP), and Local Resources Program (LRP) investments. These initiatives have provided the policy framework for Metropolitan and its member agencies to manage their water resources in a way that meets the needs of a growing population even with recurrences of the worst historic hydrologic conditions locally and in key watersheds that supply Southern California. A brief description of each water management initiative Metropolitan has undertaken to ensure continued reliability over the next 20 years follows.

### 3.6.1 Metropolitan Integrated Resource Plan

The fundamental goal of the IRP is to have a reliable water system within Southern California. Since the 2010 IRP, drought in California and across the southwestern United States has put the IRP adaptive management strategy to test. Dry conditions in California have persisted into 2015, resulting in a fourth consecutive year of drought. 2015 began with the driest January on record, resulting in the earliest and lowest snowpack peak in recorded history at only 17 percent of the traditional snowpack peak on April 1st. Since 2006, there were only two wet years, with the other eight years below normal, dry, or critically dry. The Colorado River watershed has also experienced an extended reduction in runoff. The continuing dry conditions in Southern California have impacted the region's local supplies, including its groundwater basins.

Metropolitan serves as both importer of water and regional water planner. The IRP has served as the reliability roadmap for the region. Throughout 2015, Metropolitan engaged in a comprehensive process with its Board of Directors and member agencies to review how conditions have changed since the 2010 IRP

Update and to establish targets for achieving regional reliability, taking into account known opportunities and risks. Areas reviewed in the 2015 IRP Update include demographics, hydrologic scenarios, water supplies from existing and new projects, water supply reliability analyses, and potential resource and conservation targets.

The 2015 IRP Update approach explicitly recognizes that there are remaining policy discussions that will be essential to guiding the development and maintenance of local supplies and conservation. Following adoption of the 2015 IRP Update and its targets for water supply reliability, Metropolitan will begin a process to address questions such as how to meet the targets for regional reliability, what are local and regional responsibilities, how to finance regional projects, etc. This discussion will involve extensive interaction with Metropolitan's Board of Directors and member agencies, with input from the public. The findings and conclusions of the 2015 IRP Update are (Metropolitan, Integrated Water Resources Plan, 2015):

- Action is needed – Without the investments in conservation, local supplies and the California WaterFix targeted in the 2015 IRP Update, Metropolitan's service area would experience an unacceptable level of shortage allocation frequency in the future.
- Stabilize SWP supplies – The goal for SWP supplies is to adaptively manage flow and export regulations to achieve a long-term Delta solution that will enable a healthy ecosystem and address water reliability challenges. Also, efforts will be made to work with California WaterFix and California EcoRestore to facilitate a continuation of collaborative adaptive management with key regulatory agencies.
- Develop and protect local supplies and water conservation – The 2015 IRP Update embraces and advances the regional self-sufficiency ethics by increasing the targets for additional local supplies and conservation.
- Maximize the effectiveness of storage and transfers – Rebuilding Metropolitan's supply of water reserves is imperative when the drought is over. A comprehensive water transfer approach that takes advantage of water when it is available will help to stabilize and build storage reserves, increasing the ability for Metropolitan to meet water demands in dry years.
- Continue with the adaptive management approach – The IRP is updated periodically to incorporate changed conditions, and an implementation report is prepared annually to monitor the progress in resources development. The 2015 IRP also includes Future Supply Actions that would advance a new generation of local supplies through public outreach, development of legislation and regulation, technical studies and support, and land and resource acquisitions.

### **3.6.2 Metropolitan's Local Resources Programs**

A key element within Metropolitan's IRP objectives to ensure regional reliability is to enhance local resources. The LRP provides financial incentives to member agencies to develop and use recycled water and recovered groundwater to reduce dependence on imported water supplies. Since the LRP's inception in 1982, Metropolitan has provided \$372 million to produce about 2.2 MAF of recycled water and \$132 million to produce 791,000 AF of recovered degraded groundwater for municipal use.

Metropolitan made significant improvements to the LRP in October 2014 such as providing three incentive payment structures. Metropolitan offers three LRP incentive payment options to choose from including:

sliding scale incentives up to \$340 per AF over 25 years, sliding sale incentives up to \$475 per AF over 15 years, or fixed incentives up to \$305 per AF over 25 years. This approach helps reduce operational and programmatic costs for the member agencies while creating more diversified regional resources. Metropolitan provides funding for numerous projects including recycled water, conservation, groundwater recovery, surface water storage, and ocean water desalination to help meet future demands.

Central Basin has long been involved with Metropolitan in the LRP program for recycled water development. Since 1991, Metropolitan has provided Central Basin with approximately \$15 million for recycled water development, \$3.5 million for conservation programs, and \$5.3 million for groundwater recovery projects.

### **3.6.3 Metropolitan Facility Improvements**

One of Metropolitan's most significant investments is Diamond Valley Lake (DVL), which was completed in 1999 and reached capacity in early 2003 along with the Inland Feeder. DVL is built in the saddle of two mountains in southwestern Riverside County. DVL is Southern California's largest reservoir holding 810 MAF that nearly doubled Southern California's surface storage capacity and provides additional water supplies for drought, peak summer, and emergency needs. DVL stores water imported during years when there is ample supply. There are two types of storage within the DVL, dry-year, or seasonal storage, and emergency storage. When at capacity, DVL holds enough water to meet the region's emergency and drought needs for six months and is an important component in Metropolitan's plan to provide a reliable supply of water to Southern California.

## **3.7 Central Basin's Water Supply Reliability**

Along with Metropolitan's reliability initiatives, Central Basin has also taken important steps during the past decade to reduce its service area's vulnerability to extended drought and other potential threats. Central Basin's investments in recycled water to reduce imported water for non-potable uses and the implementation of conservation devices and school education programs have resulted in more self-reliance within the region.

This section discusses the supply reliability of imported water only. Actual imported water deliveries are used in all scenarios because this supply was subject to decreased deliveries through Metropolitan's WSAP which can be modified from a five percent cut of historical deliveries up to a 50 percent cut which will fluctuate under different hydrological scenarios.

The supply reliability scenarios described in this section focus exclusively on municipal and industrial usage within Central Basin's service area. The WSAP also affects replenishment water deliveries.

Central Basin will continue to evaluate opportunities to increase its water supply portfolio within its service area in the future. Opportunities include the expansion of the recycled water system and additional conservation programs.

### **3.7.1 Normal-Year Reliability Comparison**

Central Basin has entitlements to receive imported water from Metropolitan through connections with their regional distribution system. Although pipeline and connection capacity rights do not guarantee the availability of water, they do guarantee the ability to convey water when it is available in the Metropolitan

distribution system. All imported water supplies are assumed available to Central Basin from existing water transmission facilities.

For the 2015 UWMP, the average year was selected as an average of demand based on hydrology from 1922-2004 as developed by Metropolitan. Due to the variable climate within California and multiple factors that influence demand, an average of historical supply data was used to project future demand for member agencies.

Figure 3-2 shows the average year demands within Central Basin's service area using the years 1922 through 2004.



## 2015 URBAN WATER MANAGEMENT PLAN

Average Year (Average of 1922-2004 Hydrology)					
<b>Demographics<sup>1</sup></b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Population	1,603,549	1,632,666	1,691,205	1,722,317	1,757,232
Occupied Housing Units	432,981	440,640	448,519	456,240	464,594
Single Family	299,990	301,744	305,994	312,379	315,492
Multi-Family	132,991	138,896	142,525	143,861	149,102
Persons Per Household	3.67	3.67	3.74	3.74	3.75
Urban Employment	597,299	607,087	615,477	617,966	635,359
<b>Conservation</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Conservation <sup>2</sup>	47,043	51,264	55,309	58,903	62,985
Installed Active Device Through 2015	4,874	3,335	1,924	1,456	1,258
Code-Based and Price-Effect Savings	42,169	47,929	53,385	57,447	61,728
<b>Total Demands After Conservation</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Total Demand	304,559	306,598	308,994	308,635	309,679
Retail Municipal and Industrial <sup>3</sup>	225,827	224,849	225,238	224,879	225,923
Retail Agricultural	0	0	0	0	0
Seawater Barrier	0	0	0	0	0
Groundwater Replenishment	78,732	81,749	83,756	83,756	83,756
<b>Local Supplies</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Total Local Supplies	240,205	245,038	248,862	250,678	252,018
Groundwater Production	182,300	182,300	182,300	182,300	182,300
Surface Production	0	0	0	0	0
Los Angeles Aqueduct	0	0	0	0	0
Seawater Desalination	0	0	0	0	0
Groundwater Recovery	3,995	4,567	5,139	5,711	5,807
Recycling	53,910	58,171	61,423	62,667	63,911
M&I and Agricultural	8,934	10,178	11,423	12,667	13,911
Groundwater Replenishment <sup>5</sup>	44,976	47,993	50,000	50,000	50,000
Seawater Barrier	0	0	0	0	0
Other Non-Metropolitan Imports	0	0	0	0	0
<b>Demands on Metropolitan</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Total Metropolitan Demands	64,354	61,560	60,133	57,957	57,661
Consumptive Use	30,598	27,804	26,377	24,201	23,905
Seawater Barrier	0	0	0	0	0
Replenishment Water <sup>4</sup>	33,756	33,756	33,756	33,756	33,756

All units are acre-feet except in Demographics Section.

- Growth projections are based on SCAG 2012 Regional Transportation Plan and SANDAG Series 13 Forecast.
- Includes code-based, price-effect and existing active savings through FY2014; does not include future active conservation savings. Conservation is 1990 base year. Pre-1990 add 250,000 acre-feet.
- Retail M&I projections include conservation.
- Replenishment Water include direct in-lieu replenishment and carryover storage.
- Groundwater recharge at Montebello Forebay

Figure 3-2: Central Basin Average Year Demands from Metropolitan

### **3.7.2 Single-Dry Year Reliability Comparison**

A single-dry year is defined as a single year of no to minimal rainfall within a period that average precipitation is expected to occur. Central Basin has documented that it is 100 percent reliable for single-dry year demands from 2020 through 2040 with an average demand increase of 0.2 percent using hydrologic year 1977 as the single-dry year. This percentage was determined by Metropolitan based on historical data for all of its member agencies. Demand was projected in 5-year increments with the actual percentage varying slightly for each.

Figure 3-3 shows the single dry year demands within Central Basin's service area using a repeat hydrology of 1977.

## 2015 URBAN WATER MANAGEMENT PLAN

Single Dry-Year (Repeat of 1977 Hydrology)					
Demographics <sup>1</sup>	2020	2025	2030	2035	2040
Population	1,603,549	1,632,666	1,691,205	1,722,317	1,757,232
Occupied Housing Units	432,981	440,640	448,519	456,240	464,594
Single Family	299,990	301,744	305,994	312,379	315,492
Multi-Family	132,991	138,896	142,525	143,861	149,102
Persons Per Household	3.67	3.67	3.74	3.74	3.75
Urban Employment	597,299	607,087	615,477	617,966	635,359
Conservation	2020	2025	2030	2035	2040
Conservation <sup>2</sup>	47,043	51,264	55,309	58,903	62,985
Installed Active Device Through 2015	4,874	3,335	1,924	1,456	1,258
Code-Based and Price-Effect Savings	42,169	47,929	53,385	57,447	61,728
Total Demands After Conservation	2020	2025	2030	2035	2040
Total Demand	305,232	307,269	309,666	309,306	310,353
Retail Municipal and Industrial <sup>3</sup>	226,500	225,520	225,910	225,550	226,597
Retail Agricultural	0	0	0	0	0
Seawater Barrier	0	0	0	0	0
Groundwater Replenishment	78,732	81,749	83,756	83,756	83,756
Local Supplies	2020	2025	2030	2035	2040
Total Local Supplies	240,205	245,038	248,862	250,678	252,018
Groundwater Production	182,300	182,300	182,300	182,300	182,300
Surface Production	0	0	0	0	0
Los Angeles Aqueduct	0	0	0	0	0
Seawater Desalination	0	0	0	0	0
Groundwater Recovery	3,995	4,567	5,139	5,711	5,807
Recycling	53,910	58,171	61,423	62,667	63,911
M&I and Agricultural	8,934	10,178	11,423	12,667	13,911
Groundwater Replenishment <sup>5</sup>	44,976	47,993	50,000	50,000	50,000
Seawater Barrier	0	0	0	0	0
Other Non-Metropolitan Imports	0	0	0	0	0
Demands on Metropolitan	2020	2025	2030	2035	2040
Total Metropolitan Demands	65,028	62,230	60,805	58,628	58,335
Consumptive Use	31,272	28,474	27,049	24,872	24,579
Seawater Barrier	0	0	0	0	0
Replenishment Water <sup>4</sup>	33,756	33,756	33,756	33,756	33,756

All units are acre-feet except in Demographics Section.

- Growth projections are based on SCAG 2012 Regional Transportation Plan and SANDAG Series 13 Forecast.
- Includes code-based, price-effect and existing active savings through FY2014; does not include future active conservation savings. Conservation is 1990 base year. Pre-1990 add 250,000 acre-feet.
- Retail M&I projections include conservation.
- Replenishment Water include direct, in-lieu replenishment and carryover storage.
- Groundwater Recharge at Montebello Forebay

Figure 3-3: Central Basin Single Dry Year Demands from Metropolitan

### **3.7.3 Multi-Dry Year Reliability Comparison**

Multiple-dry years are defined as three or more years with minimal rainfall within a period of average precipitation. Central Basin is capable of meeting all customer demands for imported water with significant reserves held by Metropolitan in multiple-dry years from 2020 through 2040 with an average demand increase of 0.6 percent using hydrologic years 1990-92 as the driest years. Metropolitan defined demand projections are in five-year increments and the demand varies for each.

Figure 3-4 shows the multiple dry year demands within Central Basin's service area using the years 1990 through 1992.

## 2015 URBAN WATER MANAGEMENT PLAN

Multi Dry-Year (Repeat of 1990-1992 Hydrology)					
Demographics <sup>1</sup>	2020	2025	2030	2035	2040
Population	1,603,549	1,632,666	1,691,205	1,722,317	1,757,232
Occupied Housing Units	432,981	440,640	448,519	456,240	464,594
Single Family	299,990	301,744	305,994	312,379	315,492
Multi-Family	132,991	138,896	142,525	143,861	149,102
Persons Per Household	3.67	3.67	3.74	3.74	3.75
Urban Employment	597,299	607,087	615,477	617,966	635,359
Conservation	2020	2025	2030	2035	2040
Conservation <sup>2</sup>	47,043	51,264	55,309	58,903	62,985
Installed Active Device Through 2015	4,874	3,335	1,924	1,456	1,258
Code-Based and Price-Effect Savings	42,169	47,929	53,385	57,447	61,728
Total Demands After Conservation	2020	2025	2030	2035	2040
Total Demand	302,113	309,320	311,979	311,834	312,604
Retail Municipal and Industrial <sup>3</sup>	223,984	228,174	228,289	228,078	228,848
Retail Agricultural	0	0	0	0	0
Seawater Barrier	0	0	0	0	0
Groundwater Replenishment	78,129	81,146	83,690	83,756	83,756
Local Supplies	2020	2025	2030	2035	2040
Total Local Supplies	239,238	244,072	248,433	250,315	251,769
Groundwater Production	182,300	182,300	182,300	182,300	182,300
Surface Production	0	0	0	0	0
Los Angeles Aqueduct	0	0	0	0	0
Seawater Desalination	0	0	0	0	0
Groundwater Recovery	3,880	4,453	5,025	5,597	5,807
Recycling	53,058	57,319	61,108	62,418	63,662
M&I and Agricultural	8,685	9,929	11,174	12,418	13,662
Groundwater Replenishment <sup>5</sup>	44,373	47,390	49,934	50,000	50,000
Seawater Barrier	0	0	0	0	0
Other Non-Metropolitan Imports	0	0	0	0	0
Demands on Metropolitan	2020	2025	2030	2035	2040
Total Metropolitan Demands	62,875	65,248	63,546	61,519	60,835
Consumptive Use	29,119	31,492	29,790	27,763	27,079
Seawater Barrier	0	0	0	0	0
Replenishment Water <sup>4</sup>	33,756	33,756	33,756	33,756	33,756

All units are acre-feet except in Demographics Section.

1. Growth projections are based on SCAG 2012 Regional Transportation Plan and SANDAG Series 13 Forecast.
2. Includes code-based, price-effect and existing active savings through FY2014; does not include future active conservation savings. Conservation is 1990 base year. Pre-1990 add 250,000 acre-feet.
3. Retail M&I projections include conservation.
4. Replenishment Water include direct and in-lieu replenishment and carryover storage.
5. Groundwater Recharge at Montebello Forebay

Figure 3-4: Central Basin Multiple Dry Year Demands from Metropolitan

The basis of the water year is shown in Table 3-4.

Table 3-3: Basis of Water Year Data (AF)

Wholesale: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location
		<input checked="" type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	2015		100%
Single-Dry Year	1977		100.2%
Multiple-Dry Years 1st Year	1990		100.6%
Multiple-Dry Years 2nd Year	1991		100.6%
Multiple-Dry Years 3rd Year	1992		100.6%
NOTES:			

### 3.8 Supply and Demand Assessment

A comparison between the supply and demand for projected years between 2020 and 2040 is shown in Table 3-5. The available supply will meet projected demand due to diversified supply and conservation measures. Recycled water is included with potable demands and supplies in Tables 3-5, 3-6 and 3-7 per DWR supplied tables.

Table 3-4: Normal Year Supply and Demand Comparison (AF)

Wholesale: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	307,980	312,241	315,493	316,737	317,981
Demand totals	304,559	306,598	308,995	308,635	309,679
Difference	3,421	5,643	6,498	8,102	8,302
NOTES:					

A comparison between the supply and the demand in a single dry year is shown in Table 3-6. The available supply will meet projected demand due to diversified supply and conservation measures.

Table 3-5: Singly Dry Year Supply and Demand Comparison (AF)

<b>Wholesale: Single Dry Year Supply and Demand Comparison</b>					
	2020	2025	2030	2035	2040
Supply totals	307,980	312,241	315,493	316,737	317,981
Demand totals	305,168	307,211	309,613	309,252	310,298
Difference	2,812	5,030	5,880	7,485	7,683
NOTES:					

A comparison between the supply and the demand in multiple dry years is shown in Table 3-7.

Table 3-6: Multiple Dry Years Supply and Demand Comparison (AF)

<b>Wholesale: Multiple Dry Years Supply and Demand Comparison</b>						
		2020	2025	2030	2035	2040
First year	Supply totals	307,980	312,241	315,493	316,737	317,981
	Demand totals	306,386	308,438	310,849	310,487	311,537
	Difference	1,594	3,803	4,644	6,250	6,444
Second year	Supply totals	307,980	312,241	315,493	316,737	317,981
	Demand totals	306,386	308,438	310,849	310,487	311,537
	Difference	1,594	3,803	4,644	6,250	6,444
Third year	Supply totals	307,980	312,241	315,493	316,737	317,981
	Demand totals	306,386	308,438	310,849	310,487	311,537
	Difference	1,594	3,803	4,644	6,250	6,444
NOTES:						

### 3.9 Water Quality

Water quality regulations are an important factor in Central Basin's water management activities. For imported water, Metropolitan is responsible for complying with state and federal drinking water regulations on imported water sold to Central Basin. Purveyors to which Central Basin sells imported water are responsible for ensuring compliance in their individual distribution systems up to the customer's water meter.

For groundwater quality, WRD provides Regional Groundwater Monitoring Reports for monitoring wells and in-depth water quality analysis. The program currently consists of a networks of nearly 300 monitoring wells at over 50 locations throughout the Central Groundwater Basin. As the regional groundwater management agency for the Central Groundwater Basin, the WRD has several active programs to monitor, evaluate and mitigate water quality issues.

#### 3.9.1 Imported Water

Central Basin's imported water originates from the SWP and Colorado River via Metropolitan pipelines and aqueducts. Metropolitan tests its water for microbial, organic, inorganic and radioactive contaminants as

well as pesticides and herbicides. Protection of Metropolitan's water system is a top priority. Metropolitan also has one of the most advanced laboratories in the country where water quality staff performs tests, collects data, reviews results, prepares reports and researches other treatment technologies. Metropolitan monitors and samples elements that are not regulated but have captured scientific and/or public interest.

### **3.9.2 Groundwater**

Groundwater in the Central Basin is continually monitored for the quality of the water because of its susceptibility to seawater intrusion, potential contamination from adjacent basins and migration of shallow contamination into deeper aquifers. The Alamitos Barrier, located in the southwest portion of Central Basin's service area, provides a buffer between the groundwater basin and seawater intrusion. The available supply of replenishment water to physical recharge the Basin includes local and imported water. The local water that recharges the groundwater basin comes from storm flows from the San Gabriel Valley and flow obligations under the San Gabriel River Judgment with the Upper Area of the Central Basin. This water is defined as "Make-Up" Water." Imported water is purchased from Metropolitan to be used for surface spreading at the Montebello Forebay and for seawater barrier injection at the Alamitos Barrier. Recycled water is purchased from the LACSD for blending with imported water and stormwater infiltration for spreading and injection.

### **3.9.3 Recycled Water**

Tertiary recycled water meeting Title 22 standards can be used for a wide variety of industrial and irrigation purposes where high-quality, non-potable water is needed. Central Basin relies on LACSD to meet all applicable state and federal water quality regulations for recycled water it purchases and distributes through its two systems. Central Basin purchases recycled water from LACSD's San Jose Creek Water Reclamation Plant and Los Coyotes Water Reclamation Plant (WRP). These two plants together produce approximately 137 million gallons per day (MGD) of tertiary- treated effluent. Recycled water from LACSD's reclamation plants not reused is discharged to the ocean directly and through major flood control channels.

### **3.9.4 Water Quality Protection Project**

In the early 1980's, the San Gabriel Valley aquifer was discovered to have contaminants including trichloroethylene and perchloroethylene in the water supply. Based on the contamination level, the Environmental Protection Agency declared the area as a superfund site. As the contamination plume moved south toward the Central Groundwater Basin over the next 20 years and threatened the local groundwater supplies, Central Basin developed a containment plan known as the Water Quality Protection Project (WQPP).

By taking necessary steps to ensure removal of the contaminants, it prevented any further migration of contamination from the San Gabriel Valley into the Central Groundwater Basin and from reaching the spreading grounds. The cleanup of the aquifer produces a safe and reliable potable water supply to participating groundwater producers. Central Basin obtained necessary Federal funds for implementation of the WQPP with the objective of preventing further migration of contaminants into the Central Groundwater Basin. The federally funded project consists of two extraction wells with a collector pipeline and treatment facility. The extraction wells pump out the contaminated groundwater at a combined rate of



approximately 3,600 gallons per minute and convey it via the collector pipeline to the central treatment facility where it is treated with a granular-activated carbon system for purification. The treated water continues to surpass California's stringent water quality standards and the project remains vital to safeguarding the regional groundwater supply.

DRAFT

## 4 WATER SHORTAGE CONTINGENCY PLAN

Recent water supply challenges throughout the southwest and the State of California have resulted in the development of a number of policy actions that water agencies would implement in the event of a water shortage. In Southern California, the development of such policies has occurred at both the wholesale and retail level. This section describes new and existing policies that Metropolitan and Central Basin have in place to respond to water supply shortages.

### 4.1 Shortage Actions

Water Shortage Stages can be implemented depending on the severity of the water shortage situation, in order to respond to a reduction in potable water available for delivery. In addition to water supply reductions, each Stage typically has water use restrictions that promote the efficient use of water, reduce or eliminate water waste, and enable implementation of Water Shortage Contingency Measures. Central Basin has a WSAP, detailed in Section 4.4. Central Basin's expected water allocation during a shortage is summarized in Table 4-1 below.

Table 4-1: Stages of Water Shortage Contingency Plan (AF)

Wholesale Stages of Water Storage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction <sup>1</sup>	Estimated Allocated Supplies for Central Basin
1	8%	29,474
2	15%	27,211
3	23%	24,947
4	30%	22,684
5	38%	20,421
6	45%	18,158
7	5%	15,895
8	60%	13,632
9	68%	11,368
10	75%	9,105
<sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES:		

### 4.2 Metropolitan Water Surplus and Drought Management Plan

Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage annually. Each stage is associated with specific resource management actions to avoid extreme shortages to the extent possible and minimize adverse impacts to retail customers

should an extreme shortage occur. The sequencing outlined in the WSDM reflects anticipated responses towards Metropolitan's existing and expected resource mix.

Surplus stages occur when net annual deliveries can be made to water storage programs. Under the WSDM, there are four surplus management stages that provide a framework for actions to take for surplus supplies. Deliveries in DVL and in SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage.

The WSDM distinguishes between Shortages, Severe Shortages, and Extreme Shortages. The differences between each term is listed below.

- **Shortage:** Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands using stored water or water transfers as necessary.
- **Severe Shortage:** Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.
- **Extreme Shortage:** Metropolitan must allocate available supply to full-service customers.

There are six shortage management stages to guide resource management activities. These stages are defined by shortfalls in imported supply and water balances in Metropolitan's storage programs. When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Figure 4-1 gives a summary of actions under each surplus and shortage stages when an allocation plan is necessary to enforce mandatory cutbacks. The goal of the WSDM is to avoid Stage 6, an Extreme Shortage.

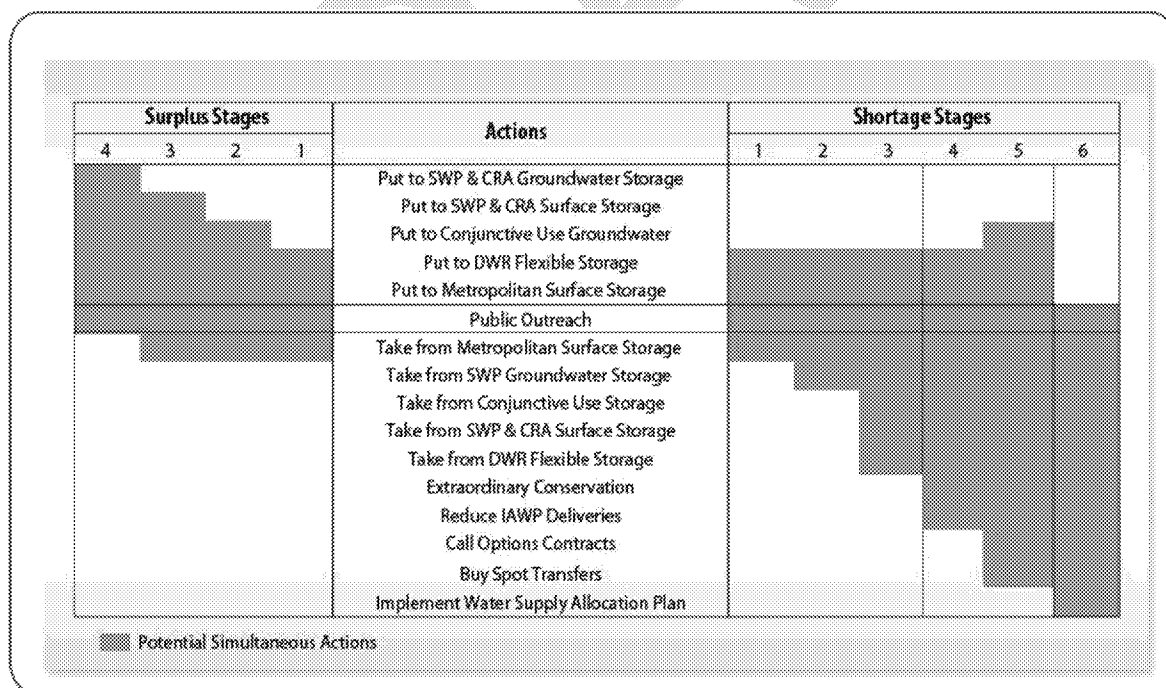


Figure 4-1: Resource Stages, Anticipated Actions, and Supply Declarations

Metropolitan's Board of Directors adopted a Water Supply Condition Framework in 2015 to communicate the urgency of the region's water supply situation and the need for further water conservation practices. The framework has four conditions, each calling for increasing levels of conservation. Descriptions for each of the four conditions are listed below:

- **Baseline Water Use Efficiency:** Ongoing conservation, outreach, and recycling programs to achieve permanent reductions in water use and build storage reserves.
- **Condition 1 Water Supply Watch:** Local agency voluntary dry-year conservation measures and use of regional storage reserves.
- **Condition 2 Water Supply Alert:** Regional call for cities, counties, member agencies, and retail water agencies to implement extraordinary conservation through drought ordinances and other measures to mitigate use of storage reserves.
- **Condition 3 Water Supply Allocation:** Implement Metropolitan's Water Supply Allocation Plan

As noted in Condition 3, should supplies become limited to the point where imported water demands cannot be met, Metropolitan will allocate water through the WSAP (Metropolitan, 2015 Final Draft UWMP, February 2016).

### 4.3 Metropolitan Water Supply Allocation Plan

Metropolitan's imported supplies have been impacted by a number of water supply challenges. In response to these challenges, Metropolitan has implemented existing policies and developed new ones.

The first action that Metropolitan implements in the event of a water shortage is suspending and/or reducing its interruptible supplies, which are supplies sold at a discount in return for the buyers agreeing to be the first cutback in the event of a shortage.

Metropolitan's Board of Directors adopted the WSAP in February 2008 in the event that Metropolitan was unable to meet "firm demands" (non-interruptible supplies).

The WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 2015 UWMP.

Metropolitan's WSAP was developed in consideration of the principles and guidelines in Metropolitan's 1999 WSDM. The WSAP's formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account the impact on retail customers and the economy, growth and population, changes in supply conditions, investments in local resources, demand hardening aspects of non-potable recycled water use, implementation of conservation savings program, participation in Metropolitan's interruptible programs, and investments in facilities.

The formula is calculated in three steps: 1) based period calculations, 2) allocation year calculations, and 3) supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

**Step 1: Base Period Calculations** – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of supply and demand is calculated using data from the two most recent non-shortage years, 2013-14.

**Step 2: Allocation Year Calculations** – The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

**Step 3: Supply Allocation Calculations** – The final step is calculating the water supply allocation for each retail agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula are discussed in detail in Metropolitan's WSAP.

In order to implement the WSAP, the Metropolitan Board makes a determination on the level of the regional shortage, based on specific criteria, annually in April. The allocations, if deemed necessary, go into effect in July of the same year and remain in effect for a 12-month period. The schedule is made at the discretion of the Board.

Metropolitan's 2015 UWMP forecasts that Metropolitan will be able to meet projected firm demands throughout the forecast period from 2020-40. However, these projections do not mean that Metropolitan would not implement its WSAP during this period (Metropolitan, 2015 Final Draft UWMP, February 2016).

#### 4.4 Central Basin's Water Supply Allocation Plan

Central Basin's Board of Directors approved to move forward reevaluating Central Basin's existing plan. The framework for Central Basin's WSAP contains similar guiding principles under Metropolitan's plan.

- The baseline for Central Basin retail agency demand is estimated on a two year average during FY 2012-13 and FY 2013-14.
- Conservation demand hardening credits can be applied using a method based on GPCD water use reductions. Qualifying mandatory conservation ordinances and requirements can be taken into consideration.
- Includes a provision for replenishment water deliveries to drought-impacted groundwater basins through a qualifying consultation process with Metropolitan.
- An Allocation Surcharge will be imposed on agencies who exceed their maximum allocated supplies.

Central Basin has developed a model used in calculating allocated supplies for each of its retailers that have imported water connections. Table 4-2 shows the estimated reductions that would be imposed on Central Basin's imported water demands based on Metropolitan's allocation reduction percentages.

Table 4-2: Central Basin Estimated Allocated Supplies per Regional Shortage Level

Regional Shortage Level	Metropolitan Allocation Reduction Percentage	Estimated Allocated Supplies for Central Basin (AF)
1	8%	29,474
2	15%	27,211
3	23%	24,947
4	30%	22,684
5	38%	20,421
6	45%	18,158
7	53%	15,895
8	60%	13,632
9	68%	11,368
10	75%	9,105

Previous penalty rates were replaced with an Allocation Surcharge which is based on the cost associated with Metropolitan's turf removal program. Metropolitan's current cost to remove turf is two dollars per square foot, and the estimated water savings for turf removal is 44 gallons per year for a period of ten years. The estimated cost of the program is \$1,480 per AF. Two times the Allocation Surcharge amount at \$2,960 per AF would allow funding of additional conservation programs to further reduce demand on imported water.

Therefore, water use between 100 percent and 115 percent of the allocated amount will result in an Allocation Surcharge of \$1,480 per AF. Water use greater than 115 percent of the allocated amount will result in an Allocation Surcharge of \$2,960 per AF.

The WSAP became effective when a regional shortage was declared by Metropolitan in 2015. The allocation period typically covers a fiscal year 12-month period beginning in July and ending in the following June. Monthly reports are used to track potential overage of annual allocations that might be charged at the end of the 12-month allocation period (Central Basin, Imported Water Supply Allocation Plan, October 2014)

#### 4.5 Three Year Minimum Supply

As a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies. As such, Metropolitan member agencies must develop their own estimates.

As captured in its 2015 UWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed that Metropolitan and Central Basin will be able to maintain the identified supply amounts throughout the three-year period.

The Three Year Estimated Minimum Water Supply is listed in Table 4-3.

Table 4-3: Minimum Supply Next Three Years (AF)

<b>Wholesale: Minimum Supply Next Three Years</b>			
	2016	2017	2018
Available Water Supply	304,559	304,559	304,559
NOTES: Based on Metropolitan's firm demands and local supplies			

## 4.6 Catastrophic Supply Interruption

In the event imported water supplies are interrupted by a catastrophic event, Central Basin, through coordination with Metropolitan, can respond at both a regional and local level.

In the event that an emergency, such as an earthquake or system failure, affects the entire Southern California region, Metropolitan would take the lead and activate its Emergency Operation Center (EOC). The EOC coordinates Metropolitan's and Central Basin's responses to the emergency and concentrates efforts to ensure the system can begin distributing potable water in a timely manner.

If circumstances render the Southern California's aqueducts out of service, Metropolitan's DVL is expected to provide emergency storage supplies for its entire service area's firm demand for up to six months. With few exceptions, Metropolitan can deliver this emergency supply throughout its service area via gravity flow, thereby eliminating dependence on power sources that could also be disrupted. Furthermore, should additional supplies be needed, Metropolitan also has surface reservoirs and groundwater conjunctive use storage accounts that can be drawn upon to meet demands. The WSDM guides Metropolitan's management of available supplies and resources during an emergency to minimize the impacts of a catastrophic event.

## 5 WATER CONSERVATION

### 5.1 Overview

In the last two decades, Central Basin has continued to achieve success through its water conservation efforts. Beginning in 2006, conservation efforts were heightened with the adoption of Central Basin's 5-year Water Conservation Master Plan. The plan evaluated current and future water savings potential and outlined a cost-effective conservation strategy in Central Basin's service area. It has since been updated in and again in 2015, which is referred to as the Conservation Monitoring Program.

Since 2011, Central Basin has also received more than \$10 million in grant funding from local, state and federal government agencies to develop and launch innovative water conservation programs. As a result of these efforts, Central Basin continues to expand a diverse program portfolio—which includes a bilingual outreach campaign titled "In a Drought, Shut Your Tap!"—that has provided assistance to the greater Los Angeles County region in meeting the State of California's aggressive 20 x 2020 water conservation goal.

In 2014, Governor Brown declared a state of emergency in response to California's extended drought, and later issued Emergency Statewide Mandatory Water Restrictions in April 2015 requiring a statewide urban water use reduction of 25 percent by February 2016.

Immediately following the Governor's state of emergency declaration, Central Basin expanded its existing "Shut Your Tap!" conservation outreach campaign by launching its "In A Drought, Shut Your Tap!" public outreach and conservation campaign. This expansion is in an effort to address the 20 x 2020 water reduction mandate.

Central Basin cities and retail agencies were directed to lower their individual potable use between 8 to 28 percent. The average conservation target for Central Basin's service area is 16 percent. These mandates forced Central Basin's entire service area to act immediately and show results. Through partnerships, grants and local funding communities throughout our service area were able to lower water use on average by 24 percent.

### 5.2 Central Basin's Past and Current Water Conservation Efforts

Since 2006, Central Basin's conservation programs have been guided by its master plan. To supplement available funding for these water-efficiency programs, the District diligently seeks grant funding assistance from federal, state and local sources, as well as identify new opportunities for regional partnerships.

Central Basin's conservation programs are made up of a wide array of cost-effective programs that are offered free to participants:

#### 5.2.1 Direct Installation Programs

- California Friendly Large Landscape Demonstration Gardens
- High-Efficiency Toilets or multi-family units
- Public facility retrofits



### **5.2.2 Public Education and Outreach**

- In a Drought, Shut Your Tap! Conservation Program
- Bilingual Speakers Bureau
- Multicultural Outreach
- School Education Programs
- Drought Gardening Classes
- Drought Response Training for City Staff

### **5.2.3 Residential Rebate Programs**

- Turf removal
- High-Efficiency Clothes Washers
- Weather Based Irrigation Controllers (under 1 acre)
- Weather Based Irrigation Controllers (1 acre or larger)
- High-Efficiency Toilets
- Rain Barrels
- Rotating Nozzles for Pop-up Spray Heads
- Soil Moisture Sensor System (under 1 acre)
- Soil Moisture Sensor System (1 acre or larger)

### **5.2.4 Commercial, Industrial, Institutional Rebate Programs**

- Weather-Based Irrigation Controller (WBIC)
- Central Computer Irrigation Controller (CCIC)
- Large Rotary Nozzles
- Rotating Nozzles for Pop-Up Spray Heads
- High-Efficiency Toilet Tank
- High-Efficiency Toilet Flush Meter
- Multi-family High-Efficiency Toilet
- Zero Water Urinal
- pH-Cooling Tower Controller (pH-CTC)
- Cooling Tower Conductivity Controller (CTCC)
- Dry Vacuum Pump (per 0.5 HP)

- Connectionless Food Steamer
- Ice-Making Machine
- Laminar Flow Restrictor
- In-stem Flow Regulator
- Plumbing Flow Control
- Multi-family High-Efficiency Toilet (4-liter)
- Soil Moisture Sensor System (SMSS)
- Turf Removal
- Public Agency Landscape
- Fitness Center HET Tank Type or Flushometer
- Fitness Center Urinals ZWU and ULWU
- Landscape Irrigation Survey
- Water Savings Survey

### **Drought and Water Efficient Rebate Presentation**

The regional rebate program, SoCal Water\$mart managed by Metropolitan is the hub for rebates in southern California. As a Metropolitan Member Agency, Central Basin partners with its purveyors to maximize the outreach and awareness of these rebates available to both residents and businesses. Presentations are made to city councils, community groups and on an individual basis.

### **5.2.5 Metropolitan's Conservation Goal**

Metropolitan is responsible for providing a safe and reliable water supply to its 26 member agencies and the 19 million residents who live and work throughout its 5,200 square-mile service area in Southern California.

In response to the cyclic drought conditions in California, and the state's 20 x 2020 plan, Metropolitan implemented its Long-Term Conservation Plan in 2011 that targets a 580,000 AF annual water savings. This would lower regional water use to 159 GPCD in 2015 and 141 GPCD in 2020. Metropolitan's actions to achieve this include, but are not limited to: education, outreach, water use ordinances, market transformation and behavioral change. In 2015, Metropolitan updated the Integrated Water Resources Plan. Through a collaborative process with member agencies of Metropolitan, the update process identified new reliability targets for resources and conservation programs.

## **5.3 California Urban Water Conservation Council**

The California Urban Water Conservation Council (CUWCC) is a partnership of agencies and organizations dedicated to maximizing urban water conservation throughout California by supporting and integrating

innovative technologies and practices, encouraging effective public policy, advancing research, training and public education, and building on collaborative approaches and partnerships. The CUWCC uses BMPs to benchmark an agency's conservation efforts. Central Basin was one of the first agencies to become a signatory to the CUWCC's MOU. Central Basin submits a wholesale water agency report to the CUWCC that details the District's progress in implementing the 14 BMP's as specified in the MOU. The most recent CUWCC Bi-Annual Report is attached as Appendix G.

### **5.3.1 Water Savings goals**

As an urban wholesale water supplier, Central Basin is not required to develop a baseline or set reduction targets to comply with SBx7-7. However, Central Basin does work with its retail agencies to help them achieve the 20 x 2020 goal. Central Basin has implemented demand management measures to encourage water conservation as described in the following section.

#### **Drought Response Training**

With the mandated water use reductions implemented by the State Water Resources Control Board, Central Basin sought to provide additional resources to our retail water agencies to assist them in meeting their specific targets. These efforts included providing drought training for our retail water agencies, where Central Basin staff educated retail water agency staff on conservation rebates available and how to respond to constituent inquiries regarding the drought. Central Basin also developed a drought training manual that was provided to each participant as a resource to have the most up to date information on current conditions. Central Basin prepared a comprehensive Drought Response Plan and Tool for agencies to use to identify water use and evaluate drought response programs.

#### **Drought Response Plan**

Central Basin has developed a Drought Response Plan along with a Drought Response Tool in order to assist retail agencies with responding to the SWRCB regulations and conservation mandates. The Drought Response Tool assists retail agencies with evaluating baseline water use by sector, identifying customer sectors and major end uses to target for water savings, evaluating drought response actions and associated water savings potential and tracking progress against water conservation standards mandated by the SWRCB.

## **5.4 Central Basin Water Conservation Programs**

Central Basin continues to engage in a variety of activities and programs designed to reduce water use consumption in our region. Conservation outreach activities included retrofitting projects at publicly-owned properties; an awareness program that provided web-based notification tools; demonstration gardens; drought-tolerant landscaping and gardening workshops; drought response training and user manuals for Central Basin purveyors; and the distribution of "Turf-it-out!" information materials.

### **5.4.1 Public Information Programs**

Central Basin's public information efforts consist of a variety of programs and practices that are used to educate the public about water conservation. Conservation literature is provided to the public at various one-day programs and at community events.

Central Basin also provides the community with a Speakers Bureau through which Central Basin's Board of Directors and staff work with local civic organizations and service clubs to provide information on a variety of programs and projects that promote conservation. Additionally, Central Basin provides education through our website, an interactive Blog, and various publication materials.

Central Basin has continued to engage its community through outreach and public education programs by integrating social marketing strategies with existing programs. Central Basin uses a variety of social media platforms to disseminate information through websites such as Twitter, Facebook, Instagram, Pinterest, LinkedIn and YouTube. Central Basin has realized many campaign successes of increased community involvement, which is reflective in the upward curve of its website traffic.

By using technology, Central Basin is connected with residents and businesses in a new and exciting way to promote the benefits and importance of water conservation. Central Basin's social media strategy is tailored to meet the needs of the local community.

Additional Public Information and Outreach programs include:

### **Metropolitan Inspection Trips**

As a Metropolitan Member Agency, Central Basin has two representatives on the Metropolitan Board of Directors. Inspection trips are a key part of Metropolitan's efforts to educate community leaders on water issues and the statewide water delivery system. The tours offered include: State Water Project Inspection Trip, Colorado River Aqueduct Inspection Trip and Diamond Valley Lake Inspection Trip. These tours are available throughout the year.

### **Water Education Tours (W.E.T.)**

Central Basin offers one-day tours of the water delivery system to members of their community. Through participation in the tours, community members are educated on the key water issues facing our region and are able to visit recycled water pump stations, waste water treatment facilities, drought demonstration gardens and a recycled water customer.

### **Max the Water Dog**

In an effort to engage the whole family on water issues, Central Basin has introduced *Max the Water Dog* mascot as the latest edition to Central Basin's outreach programs. Max is a water conservation super hero that was introduced to provide a fun approach on learning about water. *Max the Water Dog* appears at community events and interacts with the public.

### **Community Outreach Booths**

Another aspect of Central Basin's community engagement efforts is Community Outreach Booths. Throughout the year, Central Basin hosts community outreach booths at a variety of community events. District representatives are on-hand to talk with members of the community about vital water issues and provide information on resources available.

## **5.4.2 Residential Programs**

High-Efficiency Toilet (HET) programs are a key element in the conservation successes Central Basin has experienced over the years. Central Basin's HET programs have been implemented through various

partnership and grant programs, and have been made available throughout the service area. Thousands of free HETs have been distributed to eligible customers over the last few years.

Since 2010, Central Basin has completed more than 26,000 HET direct installations in single family, multifamily, and commercial, industrial and institutional (CII) facilities throughout Central Basin's service area.

Central Basin continues to implement region-wide residential rebate programs through the SoCal Water smart rebate program. Central Basin adds additional funding to qualifying washing machine devices and receives supplementary funding from participating retail agencies.

### **5.4.3 Commercial, Industrial, and Institutional Programs**

Central Basin participates in Metropolitan's "SoCal Water\$mart" rebate program. Through Metropolitan's SoCal Water\$mart, commercial, industrial, and institutional customers are eligible for rebates to help encourage water efficiency and conservation. The SoCal Water\$mart program offers cash rebates on a wide variety of water-saving technologies.

### **5.4.4 Conservation Manager**

As the regional wholesaler, Central Basin employs one full-time Conservation Manager who works throughout Central Basin's service area to promote water conservation. The manager also works with cities and water agencies to foster consumer behavioural change and implement various conservation programs that result in significant reduction in overall retail water use. Central Basin also employs two interns that provide support to the outreach efforts. The current Conservation Manager is Sandi Linares-Plimpton, who can be reached at 323-201-5511 or sandil@centralbasin.org.

Sources of funding for Central Basin's water conservation program in the last five years include: Department of Energy grant, DWR grant, Metropolitan Member Agency Conservation Program Allocation, water retail agency partnerships, and through its own fiscal budget.

### **5.4.5 Additional Innovative Conservation Programs**

#### **Smart Gardening Workshops**

Central Basin continues a partnership with the Los Angeles County Department of Public Works to bring free, educational gardening workshops to local residents. The workshops, which are offered in English and Spanish, provide information on California native plants, composting and gardening tips for residents, business owners, and local landscapers.

These partnerships have proven to be diverse in nature and valuable in strengthening the conservation efforts within Central Basin's service area, particularly within the more disadvantaged areas.

#### **Conservation Information Working Group**

On a monthly basis, Central Basin meets with its purveyors to discuss various topics pertaining to water conservation and public outreach. Guest speakers are also invited to provide insight on new water efficient technologies and programs available.

### **Drought Outreach Training**

Central Basin conducted Drought Outreach Training for city staff members as part of its outreach efforts to help the service area meet their mandated conservation goals. Cities that serve as water retailers are the first in line of contact with residents when paying water bills and dealing with water related concerns. A handbook was designed for these city staff members to provide the latest information on the drought, water efficient rebates and other conservation information. Central Basin staff provided copies of the handbook and provided training to city staff members on how to best respond to water conservation questions.

### **Drought Gardening Classes**

With the increased interest in removing lawns to conserve water, Central Basin partnered with Metropolitan to host Drought Gardening Classes throughout the service area. These three hour classes provide information and the tools on how to create drought tolerant landscaping. Residents are taught by a landscape professional. Each resident leaves the class with a better understanding on how water flows outside their home and how to best capture and use it for irrigation.

### **Conservation Pricing**

Although the conservation pricing BMP refers to the rate structure of a retail water agency to encourage a reduction of water use, Central Basin, as a wholesale agency, employs a water budget structure for its retail agencies based on a two tier rate structure. More information is described in Section 6.3 under imported water rates.

### **SCADA Integrated Asset Management Program**

The Integrated Asset Management Program is a customized computer software program that manages assets by identifying operating and maintenance inefficiencies followed by alarming operators of equipment failures. The software is unique because it uses Supervisory Control and Data Acquisition System (SCADA) data to monitor the assets and by doing so, it streamlines processes for asset maintenance and has paved the way for energy reduction.

## **5.4.6 Grant Programs**

Central Basin has been successful in receiving grant funding for conservation programs at the federal, state, and local levels through agencies such as the United States Department of Energy (DOE), DWR, and Metropolitan. The following list provides a brief summary of the individual water conservation grants that have been implemented since 2005:

### **DWR Grant (Prop 50) – High Efficiency Living Program (HELP) 10,000 HET Direct Install**

In 2007, Central Basin was awarded a DWR grant in the amount of \$1,563,900. The grant program provided funding to market, purchase and install 9,000 HETs in multi-family residential units throughout the service area, which was completed in 2014. The water savings for this program will reach over 200 AFY for 25 years.

### **DWR Grant (Prop 50) – Urban City Makeover Program**

Through the DWR Prop 50 Urban City Makeover Program, grant funding in the amount of \$113,746 provided nine disadvantaged cities with a number of water-saving resources. These included: HETs, water free urinals, native plants, weather-based irrigation controllers and water brooms. The participating cities

are: Bell Gardens, Commerce, Cudahy, Hawaiian Gardens, Huntington Park, Lynwood, Maywood, Paramount, and South Gate. This program concluded in December 2013.

**DWR Grant (Prop 50) – Commercial Landscape Wireless Valve End Use Management Research Project**

The Commercial Landscape Wireless Valve End Use Management Research Project awarded to Central Basin by DWR in the amount of \$302,052, involves the implementation of wireless valve ETo controllers in non-residential sites. The research goal is to enhance water management and water efficiency at the local, regional, and state wide levels.

**DWR Grant (Prop 50) – Large Landscape Water Conservation/Management and Education Program**

The Large Landscape Water Conservation, Runoff Reduction and Educational Program provides \$900,000 in funding for the implementation of a water management program using weather-based irrigation controllers and wireless technologies to significantly reduce the amount of runoff from large landscapes, street medians, and residential properties.

Included in the grant funding are five large community demonstration gardens. Central Basin partners with local public agencies such as cities and school Districts to create Demonstration Gardens that enrich the environmental awareness of the community and promote the benefits of water efficient gardens.

**U.S. D.O.E. (Energy Efficiency Conservation Block Grant) Water and Energy Emergency End Use Demand Management Measures Grant**

The Water and Energy Emergency End Use Demand Management Measures Grant in the amount of \$2,000,000 was awarded to Central Basin under the United States Department of Energy Recovery Act - Energy Efficiency and Conservation Block Grant Program. Under this program, funding is provided to purchase and install a series of wireless ETo controllers in residential and commercial settings that use radio commands for periodic pressure and management adjustments. A second element of the grant addresses water and energy demand management in recycled pipelines.

**U.S. D.O.E. Conservation Awareness Program (CAP)**

Central Basin completed the first grant awarded to a water agency that implemented conservation in both water and embedded energy. One project component was the development of the Conservation Awareness Program (CAP). CAP is a web-based notification program that allows water retailers to send their customers notifications, ordinances, irrigation schedules, and other custom messages. Water retailers are able to create a user account to send such notices, and residents (customers) are able to subscribe to their water provider. The website also features information on water conservation practices and rebates for water efficient devices. This program is offered at no cost to both residents and water providers.

**U.S. D.O.E. Conservation Retrofit Program**

On November 30, 2014, Central Basin completed the Department of Energy Conservation Retrofit Grant Program. The participants included the Bellflower Unified School District, the Compton Unified School District, the Lynwood Unified School District and the Montebello Unified School District. Overall, 40 school sites were audited and 32 received complete retrofits totaling to more than 8,000 completed retrofits. These installations will save an estimated 21 million gallons of water annually. These installations will assist our

region in reducing our dependence on imported water supplies and will help these public facilities in decreasing their monthly water bills.

### **High Efficiency Living Program (Proposition 50 Grant)**

On December 31, 2015 Central Basin completed the scope of work of the High Efficiency Living Program Proposition 50 Grant, which provided funding to replace high water use toilets with water efficient toilets in multi-family units throughout the service area. We installed a total of 9,484 toilets through this program. A total of 1,793 toilets installed were 0.8 gallon per flush. The remaining 7,691 toilets installed were 1.28 gallon per flush toilets. The estimated water savings through the implementation of the grant is estimated at 8,052 acre-feet of potable water and will have an estimated embedded energy savings of 256,391 kilowatts for the twenty-year life of toilets installed.

## **5.5 Current and Future Education Programs**

Central Basin's award-winning youth education programs are designed to teach students about water and the importance of conservation. Through these interactive programs, designed in collaboration with regional partners, students learn ways to use water wisely and about alternative water sources, such as recycled water. During the 2014 – 2015 fiscal year, Central Basin's education programs served over 21,000 kindergarten through 12<sup>th</sup> grade students from schools in the service area.

### **5.5.1 Education Programs**

Collaborative classroom visitation programs are a key element in Central Basin's student outreach efforts. The following is a brief description of the free water education programs offered by Central Basin:

- Water Squad Investigations (Grades 4 – 12)
- Water Wanderings (Grades 4 – 5)
- Think Watershed (Grades 4 – 6)
- Think Earth! It's Magic (Grades K – 5)
- Think Water! It's Magic (After School Program for Grades K – 5)
- "Water Is Life" Poster Contest (Grades 4 – 8)
- Waterlogged (Grades 9 – 12)
- Sewer Science (Grades 9-12)
- Conservation Connection: Water & Energy in southern California (Grades 5 – 8)
- Water for the City: southern California Urban Water Cycle (Grades 4 –8)

**Think Earth! It's Magic (Grades K-5):** A collaborative program between Central Basin and the Think Earth Environmental Education Foundation to stage free, environmental magic shows for elementary schools. Each year, this traveling magic show visits schools throughout the region to teach students about the importance of applying environmentally friendly practices around their homes and schools. It is the only



program in the state to combine an award-winning, grade-appropriate classroom curriculum with an environmental magic show assembly.

**Think Water! It's Magic (Afterschool Program for Grades K-5):** An adaptation of Central Basin 's popular Think Earth! It's Magic program, Think Water! It's Magic brings the educational environmental magic shows to extended day care and after school programs throughout the service area. The magic shows cover such topics as the water cycle, water quality, water recycling, and the importance of conservation.

**Think Watershed (Grades 4-6):** Think Watershed is a partnership of environmental stakeholders in southern California interested in creating and implementing a watershed education program for grades 4 - 6 using the Los Angeles County Office of Education's Floating Lab. Components of the program include a classroom watershed curriculum focused on the San Gabriel River Watershed and then a field trip on board the Floating Lab, a modern marine science research vessel docked in Rainbow Harbor, Long Beach.

**Water Squad Investigations (Grades 4-12):** Successfully launched in fall 2006, Water Squad Investigations is a collaborative water education program between Central Basin, LACSD and the Los Angeles County Department of Parks and Recreation. Through the program, students go on a one-day field trip to the San Jose Creek WRP and the Whittier Narrows Nature Center. By day's end, students will have gained a greater understanding of how water recycling can help conserve drinking water and simple ways to conserve water around their homes.

**Water Wanderings (Grades 4-5):** A classroom visitation program between Central Basin and the S.E.A. Lab in Redondo Beach. This hands-on program takes fourth and fifth-graders on a 2 1/2 -hour journey through California's water system. Students participate in activities that include "Touring Tide Pool," a van outfitted with touch-tanks, enabling students to touch live marine creatures and plants. Water Wanderings meets many of the fourth grade and fifth grade state standards for social science and science. By participating in this free program, students learn to appreciate California's water as a scarce, valuable resource.

**Water Is Life Poster Contest (Grades 4-8):** As part of Central Basin's annual recognition of Water Awareness Month each May, the "Water is Life" Poster Contest is a collaborative arts program between Central Basin and Metropolitan. Through the contest, students are encouraged to create posters that creatively depict various water uses and/or water use. Central Basin then selects a grand-prize winner who is awarded a fully-loaded laptop computer or tablet device. The winning poster is also submitted to Metropolitan to be included in the annual calendar and featured on water bottles and other promotional items.

**Conservation Connection: Water and Energy in Southern California (Grades 6-8):** This action-based curriculum provides students with the opportunity to look critically at important environmental issues and take responsibility for finding solutions. After learning about the vital role that water and energy play in our lives, students will have the opportunity to survey their family's water and energy use and survey water and energy use in their school. From there, they will develop, implement and monitor plans to decrease water and energy use.

**Waterlogged (Grades 9-12):** A high school visitation program between Central Basin and the Roundhouse Marine Studies Lab and Aquarium, an oceanographic teaching station. The program offers local high schools five exciting curriculum programs, each aligned to the California State Science Content Standards. Through specimen dissections, examples of current aquatic/marine science research, and practical hands-

on activities, students learn about the scientific method, the ecology of the Pacific Ocean, and the unintended impact of human life on the aquatic/marine environment.

**Solar Cup (Grades 9-12):** A partnership between Central Basin and Metropolitan, Solar Cup is a hands-on education program in which high school teams throughout southern California learn about water conservation and renewable energy by building and racing solar powered boats. Four Central Basin teams along with other teams throughout southern California compete against each other in both sprint and endurance races at Lake Skinner, in Temecula. As part of the seven-month long program, teams also research and complete various technical reports and create a water-related public service announcement. The culminating Solar Cup races take place each year in May.

**Conservation Connection Water & Energy in Southern California (Grades 5 – 8):** Where do we get the water and energy that we use? Will we always have enough to meet our needs? Conservation Connection answers those questions, showing the connections between California, our water and energy supply, and us. But providing information is only part of Conservation Connection. The goal of the curriculum is to get students actively involved— in their homes and at school – in conserving water and energy. Within the program, students have the opportunity to survey their family's water and energy use and survey water and energy use at their school. After gathering data, analyzing their findings and reviewing recommendations, students make, implement, and monitor plans to decrease water and energy use. By participating in this action- based curriculum, students will learn to look critically at important environmental issues and take responsibility for finding solutions.

**Sewer Science (Grades 9-12):** Sewer Science is an award-winning, hands-on laboratory program that will teach high school students in the District's service area about wastewater treatment. During a week-long lab course, students will create fake wastewater and employ physical, biological and chemical treatment methods and procedures to test its quality. The lab will be facilitated by biologists and chemists from LACSD, allowing students the opportunity to learn first-hand from experienced science professionals. The program meets California State Content Standards in the high school sciences for chemistry, physics and microbiology.

### 5.5.2 Future Programs

**PEAK (Grades K-5):** New for 2015-2016, PEAK is a standards-based STEM education program that empowers students to make informed energy and water decisions. Since 1975, PEAK has provided teachers with innovative curriculum and engaging activities that explore real-world applications of energy concepts. Through hands-on, inquiry-based learning, students will: increase understanding of physical and earth science concepts, be inspired to create a more sustainable world by becoming smart energy and water conservation leaders, and explore STEM career pathways. PEAK includes: Professional Development In-Services for Teachers, Classroom Labs, and School Assemblies. This program would be a partnership between Central Basin and the Energy Coalition.

## 5.6 Central Basin's Conservation Monitoring Program

The 2006 WUE Master Plan was updated by the 2011 Conservation Monitoring Program (CMP). A number of factors, including new state and federal legislation, funding limitations from partnering agencies, and new state standards have changed the dynamics of conservation throughout the last few years. The updated

WUE Master Plan reflects those changes and serves as a blueprint to help Central Basin and its retail agencies comprehensively plan for and implement future WUE programs. Its purpose is to:

- Create the strategy and blueprint to meet per capita water demand reduction goals
- Deliver the customized tools required to track performance and make future changes
- Ensure compliance with water reduction goals and regulatory requirements

Foundation and identifying and creating programs for the service area. Align with the drought and state mandate – conservation goals. Identify – evaluate how we take conservation one step further. Evaluate current water use and identify where could be more efficient. Regional support for service area (Behavioural change in water use).

## 6 WATER RATES AND CHARGES

### 6.1 Overview

Retail agencies that exclusively provide groundwater to their customers, tend to have water rates that are lower than those that serve a mix of groundwater and imported water. Imported water purchased from Central Basin and provided by Metropolitan carries not only the cost of acquiring importing, purifying (treating) and distributing the commodity throughout the region but also a long-term action plan for ensuring adequate supplies to meet growing demands through conservation, education and new locally produced supplies.

### 6.2 Metropolitan Rate Structure

In 2002, the Metropolitan Board of Directors adopted a rate structure to support its strategic planning vision as a regional provider of services, encourage the development of local supplies such as recycled water and conservation, and ensure a reliable supply of imported water. To achieve these objectives, Metropolitan called for voluntary purchase orders from its member agencies, unbundled its water rates, established a two-tiered supply rate system and added a capacity charge. Together, these rate structure components provide a better opportunity for Metropolitan and its member agencies to manage their water supplies and proactively plan for future demands. This structure remains in effect today.

#### 6.2.1 Purchase Orders

The Purchase Order is an agreement between Metropolitan and a member agency, whereby the member agency agrees to purchase a minimum amount of non-interruptible water during a 10-year period. This purchase commitment is ten times 60 percent of an agency's highest year's delivery of non-interruptible water. The Purchase Order allows member agencies to annually purchase a set amount of non-interruptible water defined as the Annual Maximum at a lower cost (Tier 1). Central Basin currently has an Annual Average Tier 1 Maximum of 71,770 AF, but no purchase order is in place with Metropolitan (Metropolitan, 2015 Final Draft UWMP, February 2016).

#### 6.2.2 Unbundled Rates and Tier 1 & 2

In order to clearly justify the different components of the costs of water on a per AF basis, Metropolitan unbundled its full service water rate. Among the components Metropolitan established are:

##### Supply Rate Tier 1

- Reflects the average water supply cost from the CRA and SWP.

##### Supply Rate Tier 2

- Reflects the Metropolitan costs associated with developing new supplies that are assessed when an agency exceeds its Tier 1 limit of firm deliveries.

**System Access Rate**

- Recovers a portion of the costs associated with the conveyance and distribution system, including capital and operating and maintenance costs.

**Water Stewardship Rate**

- Recovers Metropolitan's cost of providing incentives to member agencies for conservation, water recycling, groundwater recovery and other water management programs approved by the Metropolitan Board.

**System Power Rate**

- Recovers Metropolitan's electricity related costs, such as pumping water through the conveyance and distribution system.

**Treatment Rate**

- Recovers the treatment cost and is assessed only for treated water deliveries, whether firm or non-firm.

The Metropolitan non-interruptible treated water rates for January 1 to June 30, 2016 are displayed in Table 6-1.

Table 6-1: Metropolitan Rates Adopted for 2016

Category of Water	\$/AF
Tier 1 Supply Rate	156
Tier 2 Supply Rate	290
System Access Rate	259
Water Stewardship Rate	41
System Power Rate	138
<b>Full Service Untreated Volumetric Cost</b>	
Tier 1	594
Tier 2	728
Full Service Exchange Cost	438
Treatment Surcharge	348
<b>Full Service Treated Volumetric Cost</b>	
Tier 1	942
Tier 2	1,076
Readiness-to-Serve Charge (\$M)	153
Capacity Charge (\$/cfs)	10,900

### 6.2.3 Replenishment Service

Metropolitan provided replenishment water at a discounted rate to encourage long-term recharge and maintenance of groundwater basins and local reservoirs. Although the discounted replenishment rate was discontinued January 2013, Metropolitan continues to provide water for replenishment purposes at full service untreated rates. See table 6-1 for rates.

### 6.2.4 Metropolitan Capacity Charge

Metropolitan's capacity charge is in place to recover the costs of providing distribution capacity use during peak summer demands. The charge encourages member agencies to reduce peak day demands during the summer months (May 1 through September 30) and shift usages to the winter months (October 1 through April 30), which will result in a more efficient use of Metropolitan's existing infrastructure and defers capacity expansion costs. Metropolitan's capacity charge for 2016 is \$10,900 per cubic feet per second (cfs) (Metropolitan, 2015 Final Draft UWMP, February 2016).

The Capacity Charge is assessed by multiplying Central Basin's maximum usage by the rate. The maximum usage is the highest daily average usage (per cfs) for the past three summer periods. Table 6-2 shows Central Basin's maximum usage for the 2015-16 calendar year.

Table 6-2: Central Basin CY 2012-14 Capacity Charge (cfs)

Peak Flow 2012	Peak Flow 2013	Peak Flow 2014	3-Year Max	Capacity Charge
74.5	73.6	61.0	74.5	<b>\$812,050</b>

### 6.2.5 Readiness-To-Serve Charge

The Readiness-to-Serve (RTS) charge recovers a portion of Metropolitan's debt service costs associated with regional infrastructure improvements. The RTS charge is a fixed charge assessed to each member agency regardless of the amount of imported water delivered in the current year. It is determined by the member agencies' firm imported deliveries over the past 10 years. All member agencies of Metropolitan have the right to choose how that designated amount is collected. Central Basin elected to have Metropolitan collect the majority of the RTS obligation through a "Standby Charge" assessed on all parcels within its service area. The remainder is collected as a surcharge on Central Basin's commodity rates. The surcharge is discussed in section 6.3.3.

### 6.2.6 Metropolitan Standby Charge

In 1992, the State Legislature authorized Metropolitan to levy a standby charge that recognized that there are economic benefits to lands that have access to a water supply, whether or not such lands are using it. A fraction of the value of the benefit accruing to all landowners in Metropolitan's service territory can therefore be recovered through the imposition of a standby charge. Metropolitan assessed this charge only within the service area of the member agencies that requested such a parcel charge to help fund a member agency's RTS obligation as discussed in section 6.2.5. Within Central Basin, the Metropolitan Standby Charge is currently \$10.44 per parcel.

## 6.3 Central Basin's Imported Water Rates

As Metropolitan adopted a new rate structure so did Central Basin. In 2003, Central Basin passed through Metropolitan's Purchase Order by offering customer agencies voluntary purchase agreements and assessing Metropolitan's Capacity Charge. Central Basin also revised the administrative surcharge to be applied uniformly to all classes of imported water sold. It has been, and continues to be the policy of Central Basin to pass through imported water rate increases from Metropolitan to all cities and agencies in the Central Basin service area. Described below are elements of the rate structure that Central Basin applies to the delivery of imported water.

### 6.3.1 Purchase agreements

Metropolitan has a purchase order program in place to allow opportunities for member agencies to purchase the majority of their water sales at the lower Tier I supply rate. Historically, Central Basin entered into a

Purchase Order commitment with Metropolitan and established its own purchase contract policy with its retail agencies. The prior purchase order commitment between Central Basin and Metropolitan expired on December 2014. The purchase order program is voluntary for Metropolitan member agencies. In November 2014, Metropolitan proposed a consideration for its member agencies to enter into another 10-year purchase order program. Specifics of the program include the Tier 1 maximum water demand level to be based on 90 percent of the member agency's base period of firm demands. Minimum commitments are cumulative. Any purchases above the 90 percent base amount would be charged at the higher Tier 2 rate. For the member agencies who do not enter into a new agreement, they would still have the option of purchasing up to 60 percent of their base firm demand at the lower Tier 1 rate. Under the prior Purchase Order, Central Basin met its commitment level to purchase a firm demand of imported water. Additionally, Central Basin's purchase order was modified from the original version to increase the base allocation of Tier 1 water. This increase was based on historical replenishment sales and needed to be included as part of Tier 1 deliveries because Metropolitan's original replenishment rate program was discontinued in November 2012. Under this base allocation increase, Central Basin opted out of the Purchase Order Commitment, in an effort to avoid take or pay obligations.

As such, Central Basin will have 71,770 AF as the maximum amount of water the District can purchase at the lower Tier 1 rate on a calendar year basis for the next 10 years, effective from January 1, 2015 to December 31, 2024. As a whole, these allowances do not represent current demands as imported water purchases have declined significantly over the last decade due to conservation and increasing reliance on groundwater due to increases in imported water prices. Now that Central Basin no longer has a minimum purchase commitment to Metropolitan but must still stay within its Tier 1 allocation, Central Basin implemented individual purveyor Tier 1 water budgets as a mechanism to fairly pass on any Tier 2 costs Central Basin may incur.

These Tier 1 budgets were developed to address the following major considerations:

Purveyors should only be charged Tier 2 prices if Central Basin is charged Tier 2 by Metropolitan;

- An appropriate allowance should be reserved for replenishment water needs and for future water storage purchase demands;
- Purveyor water budgets should be based on demonstrated need;
- A mechanism should be included to allow for emergencies or other unanticipated events that would increase demand from historical levels;
- Take-or-pay purchase commitments are only appropriate if amounts over historical demand levels are requested by the purveyor. These requests would tie-up water that could otherwise be committed and sold elsewhere such as for replenishment and a commitment would ensure purveyors would only request additional amounts if truly necessary; and
- Budgets need to be set on a long term basis to allow for proper financial and water resource planning.

### **Proposed Water Budgets and Tier 2 Rate Pass-through**

Under the proposed plan, water budgets for the calendar years 2015-2024 would be based on the average direct consumption imported water sales from the last five fiscal years (fiscal year 2010-2014) as a basis for historically demonstrated need. A minimum base of 10 AF is granted for any purveyor that is connected to the Metropolitan system and paid a meter service charge to allow for minimal flows to occur without being charged Tier 2 rates.



### Adjustments

Adjustments to the amounts could be made under a temporary one year adjustment or longer term adjustments until December 31, 2024 under the proposed plan. As there is a high likelihood in any given year that the full 33,340 AF reserved for other water sales will not be used, the General Manager is given the authority to grant temporary adjustments to purveyors in that year to allow for emergencies or other unanticipated events if there is sufficient uncommitted or unsold water available in the Central Basin Tier 1 allowance from Metropolitan. Routine longer term adjustments would be accomplished through an annual process whereby a purveyor may request additional water through the remaining 10 year period.

### Tier 2 Rate Pass-Through

So that purveyors only bear real costs if they are incurred by the District, it is proposed that purveyors be charged their proportional share of Tier 2 premium costs. These would be charged to applicable purveyors on the same annual basis that MWD would charge the District if it goes over its allowance.

The following is an example of the proposed methodology:

- Central Basin MWD buys 72,770 AF from MWD in 2015 (1,000 AF over Tier 1 Allowance)
- Total amount of imported water direct consumption from purveyors over their Tier 1 limit = 4,000 AF
- Purveyor No. 1 – 3,000 AF (75% of total)
- Purveyor No. 2 – 1,000 AF (25% of total)
- Central Basin is charged \$132,000 in Tier 2 premium costs from MWD
- $(\$1,055 \text{ Tier 2 rate} - \$923 \text{ Tier 1 rate}) = \$132 \text{ Tier 2 premium} \times 1,000 \text{ AF over Tier 1 limit}$
- Purveyor No. 1 is charged \$99,000  $(\$132,000 \times 75\%)$
- Purveyor No. 2 is charged \$33,000  $(\$132,000 \times 25\%)$

### 6.3.2 Administrative Surcharge

One of the main revenue sources for Central Basin is the Administrative Surcharge applied to all imported water sold. In 2003, Central Basin revised the Administrative Surcharge to be uniformly applied to all imported water regardless of the type delivered. Revenue from the surcharge recovers Central Basin's administrative costs including planning, outreach and education, and conservation efforts. Central Basin's Administrative Surcharge is \$70 per AF for FY 2015-16.

### 6.3.3 Infrastructure Surcharge

Central Basin has continued to issue the infrastructure surcharge established in 2010. The charge applies to all water sold, including recycled water. The purpose of charge is to help cover the cost of expanded recycled water infrastructure to support regional reliability goals. The charge for FY 2015-2016 is currently at \$20 per AF.

### 6.3.4 Readiness-To-Serve Surcharge

As described above, Metropolitan levies Central Basin with a RTS charge to recover a portion of its debt service costs, which is covered mostly by the Metropolitan Standby Charge. However, the remaining balance is collected on the commodity rate. This RTS charge is added to Central Basin's commodity rates for only non-interruptible water.

### 6.3.5 Water Service Charge

Water utility revenue structures benefit from a mix of fixed and variable sources. Central Basin's Water Service Charge recovers a portion of the agency's fixed administrative costs but is a relatively small portion of its overall revenue from water rates.

### 6.3.6 Central Basin's Capacity Charge

This charge, as described in Section 6.2.5, is intended to encourage customers to reduce peak day demands during the summer months, which will result in more efficient use of Metropolitan's existing infrastructure. Central Basin has passed through this Metropolitan charge to its customer agencies by applying Metropolitan's methodology. Each customer's Capacity Charge is determined from their highest daily average usage (per cfs) for the past three completed summer periods of May 1 through September 30. However, because Metropolitan assesses Central Basin on the coincident daily peak of all the connections and aggregate of all its customers' daily peak as the non-coincident peak, Central Basin is able to keep the Capacity Charge rate lower than the Metropolitan rate to its customers.

## 6.4 Recycled Water Rates

Central Basin's recycled water program is comprised of two distribution systems: the E. Thornton Ibbetson Century Water Recycling Project and the Esteban Torres Rio Hondo Water Recycling Project with more than 80 miles of pipeline and four pump stations: three owned by Central Basin and one owned by the City of Cerritos. Since 1992, Central Basin has encouraged the maximum use of recycled water to industries, cities and landscape irrigation sites through the economic incentive based on purveyor rate differences. Central Basin's recycled water rate schedule is shown in Table 6-3.

Table 6-3: 2015-2016 Recycled Water Rates (\$/AF)

Volume (AF/Month)	Central Basin Service Area	Malburg Generating Station	Outside of Central Basin Service Area
0-25	556	414	579
25-50	556	385	579
50-100	507	356	528
100+	507	327	528

#### **6.4.1 Recycled Water Rates**

Central Basin's recycled water rates are set up in a two-tiered, declining block rate structure so they may further encourage the use of recycled water. Furthermore, the rates are wholesaled at a significant reduction to imported rates to promote recycled water use.

The "outside of the Central Basin service area" rate is assessed to customers outside of Central Basin's service boundaries which pay an additional charge in each tier. This additional charge is applied to make up for the recycled water Standby Charge that is not levied on their parcels.

#### **6.4.2 Standby Charge**

In addition to the Metropolitan Standby Charge, there is a recycled water standby charge that is levied by Central Basin to each parcel within its service area. A \$10 per parcel charge is administered by Central Basin to provide a source of non-potable water completely independent of drought-sensitive supplies. The revenue collected from this charge is used to pay the debt service obligations on Central Basin's water recycling facilities. Each year the Board holds a public hearing where they adopt Central Basin's Engineer's Report and Resolution to assess this charge. The stand-by charge generates about \$ 3.3 million annually which is applied exclusively to retire Central Basin's debt obligation for construction of the recycled water system.

## 7 RECYCLED WATER

### 7.1 Overview

Recycled water is the basis of Central Basin's efforts to augment local supplies and reduce dependence on imported water. Planning and construction of Central Basin's recycled water system began in the early 1990's. Recycled water is used where economically feasible for non-potable applications such as landscape irrigation, commercial and industrial processes such as cooling, and indirect potable reuse through groundwater replenishment.

An overview of Central Basin's water recycling system including treatment and distribution, past, current and projected sales and system expansion projects. The cities of Cerritos and Lakewood have recycled water programs within the Central Basin service area.

### 7.2 Recycled Water Sources and Treatment

#### 7.2.1 Central Basin's Source Water

The source of Central Basin's recycled water comes from LACSD treated wastewater. Central Basin does not collect or treat its municipal wastewater. LACSD operates six WRP's in the Los Angeles Basin producing approximately 457 MGD of secondary effluent. Approximately one-third of the secondary effluent undergoes additional treatment for non-potable uses such as recycled water.

Central Basin purchases a portion of this recycled water from the Los Coyotes WRP and the San Jose Creek WRP. These plants provide approximately 137 MGD of Title 22 tertiary treated water for distribution. Under the March 11, 2015 Agreement for Purchase and Sale of Recycled Water with LACSD, Central Basin is allotted 20.54 MGD (23,000 AFY) of recycled water through 2017, but the allotment will decrease to 9.38 MGD (10,500 AFY) after 2017. Central Basin has never exceeded 5.27 MGD (5,900 AFY). LACSD looks to beneficially reuse all of its recycled water and the Agreement with Central Basin reflects a reasonable growth margin to allow for increases in demand and new customers. A detailed description of the two WRP's are provided below.

##### **San Jose Creek Water Reclamation Plant**

The San Jose Creek WRP is located in unincorporated Los Angeles County adjacent to the City of Whittier. The San Jose Creek WRP was built in the early 1970's and serves a large residential population of approximately one million people. The WRP has a wastewater treatment capacity of 100 MGD and approximately 62.52 MGD of recycled water is produced for use at locations throughout the region. Over 130 sites are served that provide groundwater recharge at the San Gabriel River and Rio Hondo Spreading Grounds as well as irrigation of parks, schools and greenbelts. Approximately 22 MGD of the recycled water from San Jose Creek WRP is sent to percolation basins for groundwater recharge.

##### **Los Coyotes Water Reclamation Plant**

The Los Coyotes WRP is located in Cerritos serving a population of 370,000 people. The WRP has a wastewater treatment capacity of 37.5 MGD and produces approximately 21.20 MGD of recycled water that

is used at over 270 sites throughout the region. The recycled water provides irrigation for schools, golf courses, parks, nurseries and greenbelts as well as industrial use at local companies for carpet dying and concrete mixing.

The amount of wastewater collected and treated by the two WRP's is expected to remain relatively consistent during the next 25 years despite population increases. According to LACSD analysis, population increases are not projected to be significant enough to make it economically feasible to expand the WRP's. Since 1999, LACSD's effluent has been decreasing annually due to conservation efforts and economic conditions. Based on LACSD's "FY 2013-14 Annual Report on Recycled Water", the San Jose Creek WRP is treating wastewater at approximately 40 percent below the plant capacity and the Los Coyotes WRP is treating wastewater at approximately 41 percent below its capacity. Central Basin does not directly treat or discharge any wastewater as they are a wholesaler.

Generally, Central Basin provides irrigation to parks, golf courses, schools, nurseries, freeway and street medians, slopes, and other greenbelt areas. Various industries, such as the Shaw-Tufted Carpet Mill use recycled water for carpet and textile dyeing, metal finishing, concrete mixing, cooling tower supply, and other process water use. Industrial uses include but are not limited to concrete mixing (Robertson's Ready-Mix in Paramount and Santa Fe Springs), sand mold manufacturing process (Pacific Alloy Castings in South Gate), cooling plant operations at co-gen facilities (Metropolitan State Hospital in Norwalk), and power plant cooling (Malburg Power Plant in Vernon).

### **7.2.2 Treatment Process**

Recycled water undergoes a multi-stage treatment process that produces high quality water that meets the Division of Drinking Water Title 22 standards. Title 22 standards address specific treatment requirements for each type of beneficial reuse. Approximately 2,000 tests are performed monthly to ensure water quality meets all State and Federal requirements.

The recycled water produced at the San Jose Creek and the Los Coyotes WRP's undergoes tertiary treatment and denitrification. Tertiary treatment provides additional treatment to secondary effluent with coagulation, filtration and disinfection. Tertiary treated water can be used for a wide variety of industrial, commercial, and irrigation purposes where high-quality, non-potable water can be used.

## **7.3 Central Basin's Recycled Water System**

### **7.3.1 Existing System**

Central Basin's regional water recycling program is comprised of two distribution systems: E. Thornton Ibbetson Century Water Recycling Project (Century Distribution System) and the Esteban Torres Rio Hondo Water Recycling Project (Rio Hondo Distribution System). These distribution systems are interconnected to operate as one recycled water supply system to deliver recycled water for landscape irrigation, commercial, and industrial uses throughout the Central Basin service area. Central Basin's recycled water system is comprised of over 80 miles of pipeline with diameters ranging from 4-inch to 48-inch pipelines, three pumping stations owned by Central Basin, one pump station owned by the City of Cerritos, and service laterals.

The Century Distribution System began delivering recycled water in 1992. The system currently delivers tertiary treated recycled water from LACSD's Los Coyotes WRP and serves the cities of Bell, Bellflower, Bell Gardens, Compton, Cudahy, Downey, Lakewood, Huntington Park, Lynwood, Norwalk, Paramount, Santa Fe Springs, South Gate, and Vernon.

In 1994, the Century Distribution System was extended into the northern portion of Central Basin's service area. The extension, known as the Rio Hondo Distribution System, delivers tertiary treated recycled water from LACSD's San Jose Creek WRP and serves the cities of Pico Rivera and Whittier in addition to all cities by the Los Coyotes WRP.

In FY 2014-15, Central Basin's recycled water system delivered approximately 5,160 AF of water for non-potable uses. Over the next 25 years it is anticipated that Central Basin will increase its sales with new connections. Central Basin works toward connecting new customers to its recycled water system every year to further reduce demands on imported potable water.

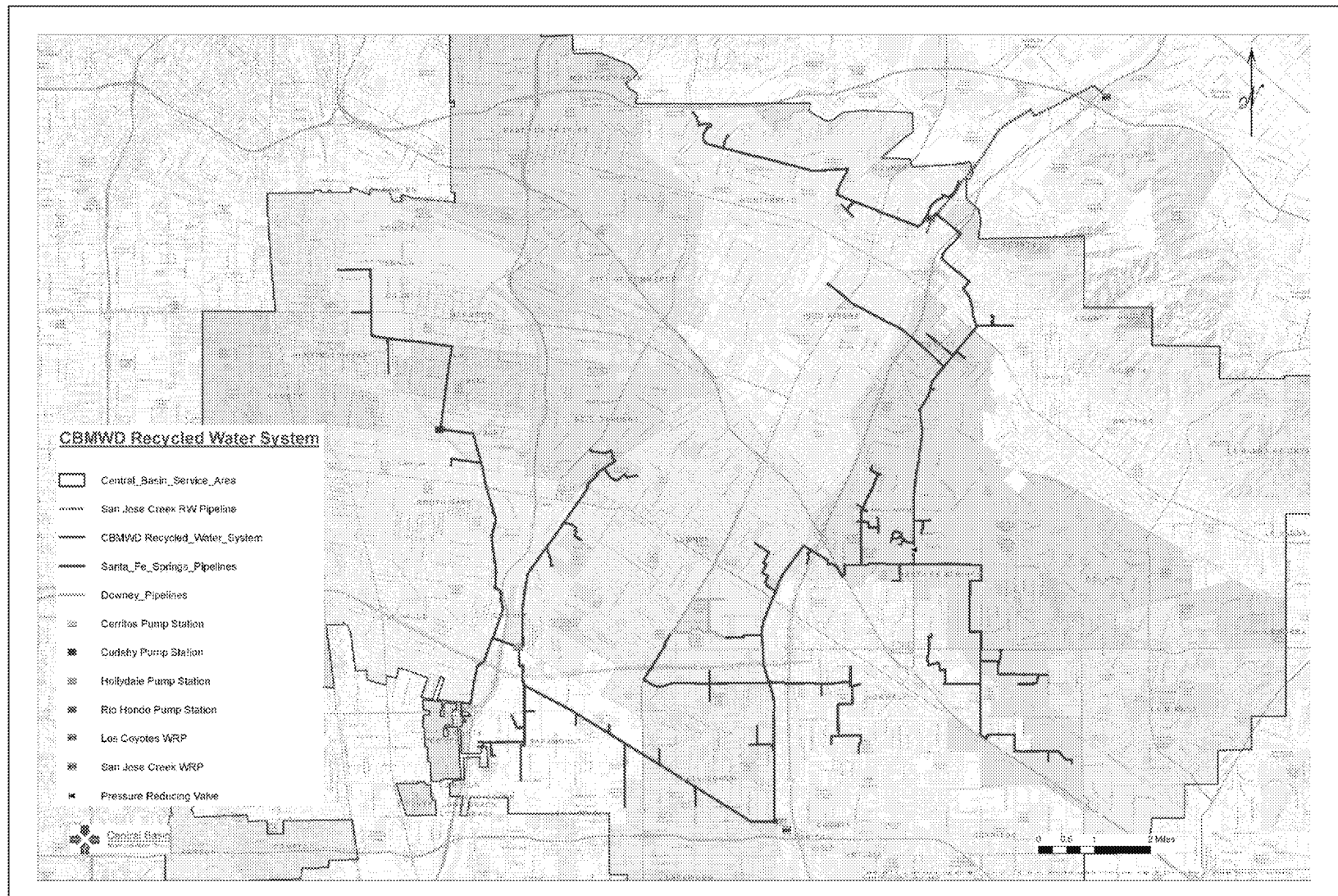


Figure 7-1: Central Basin's Recycled Water System

## 7.3.2 Recycled Water Use

### 7.3.2.1 Historic and Current

Landscape irrigation constitutes about the majority of Central Basin's current recycled water use, therefore water sales are highly impacted by rainfall in the region. The amount of recycled water supplied by Central Basin from FY 2005-15 has totalled more than 48,000 AF. Central Basin anticipates recycled water sales to increase in the future as more customers switch from potable water to recycled water due to the supply reliability and the economic incentives associated with converting from potable to recycled water.

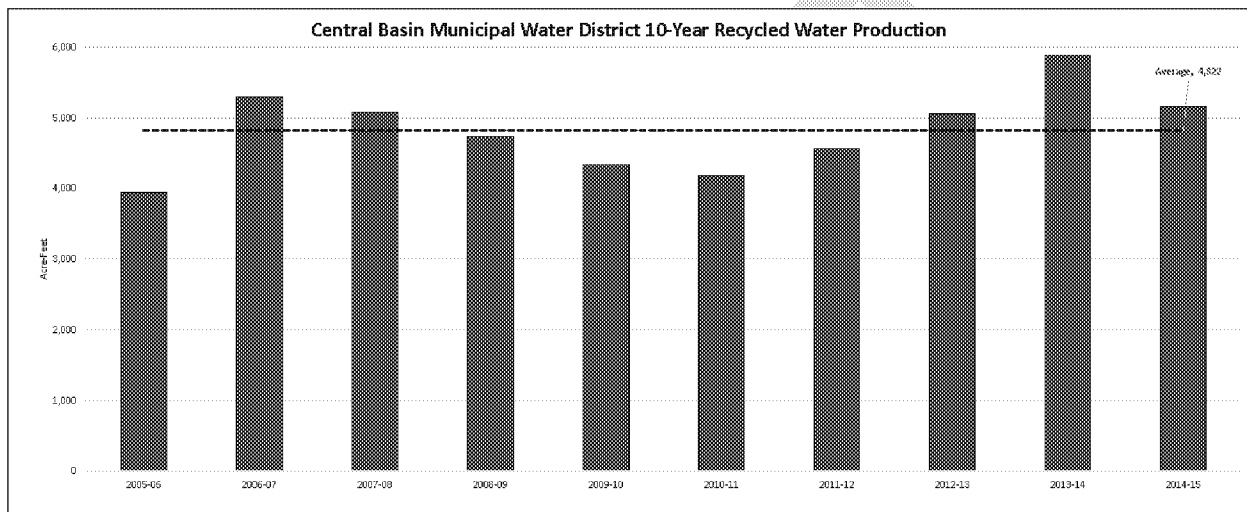


Figure 7-2: Central Basin Historical 10 Year Recycled Water Production

Table 7-2 provides a detailed breakdown of historical annual sales to each retail agency from Central Basin.



## 2015 URBAN WATER MANAGEMENT PLAN

Table 7-1: Historical Recycled Water Annual Sales FY 2006-15 (AF)

FYE	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bellflower Municipal	14	18	19	13	10	7	13	10	17	11
Bellflower-Somerset	103	119	123	122	104	100	120	118	131	127
Cudahy	6	7	7	7	6	5	7	7	8	7
Downey	609	861	742	753	742	658	754	760	806	738
Golden State Water Company	477	549	565	566	495	471	534	553	544	381
Huntington Park	45	59	60	54	51	45	50	50	35	42
Los Amigos Golf Course	0	0	0	0	0	120	189	227	255	225
Lynwood	32	25	19	5	2	2	3	16	15	18
Norwalk	75	113	121	100	94	93	82	113	108	80
Paramount	372	451	395	339	354	315	327	318	348	287
Park Water	307	416	355	319	271	246	274	341	333	248
Pico Rivera	36	37	28	28	17	24	55	71	87	107
Pico Water District	0	0	0	0	0	0	0	12	25	40
San Gabriel Valley Water Company	56	74	65	59	52	57	74	100	135	129
Santa Fe Springs	959	794	838	647	562	503	529	643	1,032	986
South Gate	153	176	210	127	113	219	97	147	238	185
Upper San Gabriel Valley Municipal Water District	52	642	661	659	621	544	639	708	790	657
Vernon	578	855	759	831	752	669	701	789	885	813
Whittier	61	116	108	87	70	85	54	69	94	81
<b>Total</b>	<b>3,936</b>	<b>5,311</b>	<b>5,073</b>	<b>4,716</b>	<b>4,317</b>	<b>4,164</b>	<b>4,501</b>	<b>5,051</b>	<b>5,885</b>	<b>5,160</b>

Recycled water sales peaked between FY 2006-08 and again between FY 2012-15. The FY 2012-15 peak took place during a multi-year drought. Central Basin still anticipates large increases in sales over the next five to ten years with completion of capital improvement projects that expand the system along with connections to new customers throughout the service area.

Table 7-3 shows Central Basin's Recycled Water System's projected recycled water use for 2015 from the 2010 UWMP compared to actual 2015 use. The actual 2015 use was lower than that projected from 2010.

Table 7-2: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (AF)

<b>Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual</b>		
<b>Name of Receiving Supplier or Direct Use by Wholesaler</b>	<b>2010 Projection for 2015</b>	<b>2015 actual use</b>
Municipal, Industrial, and Agricultural Use	6,700	5,160
<b>Total</b>	6,700	5,160
<b>NOTES:</b>		

### 7.3.2.2 Future Recycled Water Projects

It has been part of Central Basin's Capital Improvement Projects Plan and Five (5) Year Recycled Water Facilities Plan (Recycled Water Master Plan) to expand the existing recycled water distribution system. Current drought conditions, new regulations, and available funding through Proposition 1 have accelerated Central Basin's expansion efforts. Projects included in the Preliminary Capital Improvement Projects Plan are described below.

**Central Basin Municipal Water District Recycled Water Distribution System Storage Project** - The existing Central Basin recycled water system is divided into three pressure zones. Zone 1 in the north is supplied from the Rio Hondo Pump Station. To the south is Zone 2, which can receive water from Zone 1 through a pressure-reducing valve or from the Cerritos Pump Station through variable frequency drives currently set to maintain system pressures. Zone 3 lies in the western portion of the service area and is supplied through the Hollydale Pump Station from Zone 2. All three pressure zones make a hydraulically closed system with no storage to buffer customer demands. Since water can be fed from Zone 1 into Zone 2, but not completely in the opposite manner, Rio Hondo Pump Station needs to be operational whenever there are demands in Zone 1 downstream of the pump station in the Pico Rivera and Montebello areas.

Operation of the recycled water system cannot be evaluated with an isolated view of only new customers due to the movement of water from one pressure zone to another and with two water sources. Hydraulic analysis encompasses all aspects of the recycled water system from pressure-reducing valve settings to pumping station operations. System expansion, customer changes in operations and demands can significantly alter system conditions experienced without storage.

In addition, recycled water supply is defined by a contract agreement with the Los Angeles Sanitation Districts for two recycled water sources. Central Basin's two recycled water supply sources are the San Jose Creek Water Reclamation Plant and the Los Coyotes Water Reclamation Plant. Overall volume limits can be increased over time and will need to be considered for future expansion. In the future, storage will help prevent supply shortages and balance demands from supply sources.

Prospective expansion projects and demands are emerging due to potable water conservation measures being implemented by the State of California, and locally within Central Basin's service area. To ensure a reliable regional recycled water supply to offset potable water demands; Central Basin is looking to implement storage in the form of storage tanks. The number, type, size, and locations for storage tanks is yet to be determined. Piping and pumping needs are also to be determined. Central Basin is looking to

complete an in depth storage study that will include the additional demands currently being developed under related expansion projects.

***West San Gabriel Recycled Water Expansion Project*** - Central Basin, Montebello Land Company, City of Montebello, San Gabriel Valley Water Company, and the City of Monterey Park are looking to construct a pipeline to bring recycled water supply into northern area of the City of Montebello, City of San Gabriel and the City of Monterey Park.

The recycled water pipeline will extend from the existing Central Basin system in the City of Montebello. Currently, confirmed annual recycled water demand is estimated to be 800 AFY, including temporary irrigation estimated to be 200 AFY. Additional recycled water connections and demand estimated as 1,500 AFY are currently being investigated and will influence final pipe diameters and length. Final design diameter for the pipeline will be between 16-inches and 30-inches in diameter. The present design, for confirmed demands in the amount of 800 AFY, consist of 16-inch diameter piping for 20,500 (3.8 miles) linear feet. A pump station and master meter will also be constructed for this project.

Project timelines will be impacted by the demand needs of the Montebello Hills Specific Plan, a new housing development, in the City of Montebello. The developer, Montebello Land Company, has a need for recycled water supply as soon as October 2016. To accelerate this project, Central Basin is exploring the possibility of dividing this project into phases.

Phase 1 and phase 2 will bring a 16-inch to 30-inch diameter pipeline approximately 7,500 linear feet up to points of connection for the Montebello Hills Specific Plan, Montebello Town Center, and the Shops at Montebello. Phase 3 will extend a 16-inch to 30-inch diameter pipeline north 5,500 linear feet to serve Resurrection Cemetery and additional sites currently being investigated. Phase 3 will extend the pipeline an additional 7,000 linear feet to serve additional sites out of Central Basin's service area. Additional pipeline alignments may be added to connect additional sites.

***La Mirada Recycled Water Expansion Project*** - It has been part of Central Basin's Capital Improvement Projects Plan and Five (5) Year Recycled Water Facilities Plan (Recycled Water Master Plan) to expand our existing recycled water distribution system. Current drought conditions, new regulations, and available funding through Proposition 1 have accelerated Central Basin's expansion efforts.

A recycled water project Central Basin is currently looking to fast-track is the La Mirada Recycled Water Expansion Project. Central Basin already has a willing city (La Mirada) and a willing retail water agency (Suburban Water Systems) to provide the support necessary to make the project viable.

Central Basin is planning to expand the existing recycled water distribution system in south Santa Fe Springs into La Mirada to pick up several large landscaped facilities including La Mirada Park, La Mirada Golf Course, La Mirada High School, Olive View Cemetery, Biola University, La Mirada City Buildings, Behringer Park, and many more recycled water sites that are currently being investigated. The number of potential recycled water customer connections is estimated to be around 24 sites. These sites are estimated to use a cumulative total of approximately 900 AFY of potable water for landscape irrigation. Facilities needed consist of approximately 9,100 linear feet of 8-inch diameter piping; 10,100 linear feet of 12-inch diameter piping; and 20,900 linear feet of 16-inch diameter piping. The recycled water expansion would start by connecting to Central Basin's existing recycled water pipelines at Bonavista Avenue, continue east on Gannet Street, go north on Valley View Avenue, and then continue east through the most cost effective route.

**Gateway Cities Recycled Water Expansion Project** - The cities of South Gate, Bell Gardens, and Lynwood and Central Basin are looking into partnering to expand Central Basin's existing recycled water system into their cities to supply more sites with recycled water. Under a bundled project named the Gateway Cities project, submitted for Proposition 84 funding, the benefit will be providing 453 AFY of water savings and water quality improvement. This will be done by preparing planning, design, and environmental documentation for pipelines that will extend the Central Basin recycled water system. After completing this portion of the project, the partnering agencies plan to look to Proposition 1 funding for the design and construction of the project. The Project will provide 453 AFY of recycled water to irrigate nine parks and schools, reducing the need for potable water supply at these facilities.

### Bell Gardens

Central Basin and the City of Bell Gardens are looking to construct a pipeline to expand the recycled water supply into the City. The recycled water pipeline will extend from the existing Central Basin system located on Park Lane to sites located within the City. Currently, confirmed annual recycled water demand is estimated to be 90 AFY. Central Basin has an existing 16-inch pipeline on Park Lane before the cross section with Garfield Avenue. Central Basin plans to extend a 16-inch pipeline for approximately 2,950 linear feet along Garfield Avenue from Park Lane to Florence Place and a 12-inch pipeline for approximately 2,320 linear feet along Florence Place to Sudan Avenue to connect Suva Elementary School. The plan is to also add an 8-inch pipeline along Emil Avenue from Florence Place to connect Bell Gardens Park.

### Lynwood

Central Basin and the City of Lynwood are looking into constructing a pipeline to expand the recycled water supply into the City. The recycled water pipeline will extend from the existing Central Basin system located on Wright road to sites located within the City. Currently, confirmed annual recycled water demand is estimated to be 206 AFY. Central Basin has an 8-inch pipeline along Wright Road. Central Basin plans to extend a 12-inch pipeline for approximately 6,120 linear feet along Fernwood Avenue from Wright Road to Bullis Road and a 12-inch pipeline for approximately 1,800 linear feet along Bullis Road to connect Lynwood City Park, Linear Park, and Lynwood City Hall Complex.

### South Gate

Currently, confirmed annual recycled water demand is estimated to be 236 AFY. Final design diameter for the pipeline will be between 8-inch and 12-inches. The current design for confirmed demands of 236 AFY, consist of 12-inch diameter piping for 14,000 linear feet and 8-inch diameter piping for 1,860 linear feet. The City of South Gate Recycled Water Line Extension will start with a 12-inch line from Burke Avenue to Alameda Street and will serve Firestone Boulevard Medians, South Gate Middle School, San Gabriel Avenue Elementary, South Gate High School, Willow Elementary School, the East Los Angeles Community Education Center, and the Alameda Street Commercial Industrial Development Complex. There will be an 8-inch line along California Avenue from City Place to Southern Avenue that will serve South Gate City Hall and Cesar Chavez State Park.

**Pico Rivera Mines Avenue Recycled Water Expansion Project** - Central Basin is looking to construct a pipeline to expand the recycled water supply within the City of Pico Rivera. The recycled water pipeline will extend from the existing Central Basin system located on Mines Avenue to sites located within the City. Previous capital projects implemented a 12-inch and 8-inch recycled water lateral in Mines Avenue. Several

potential sites require additional expansion to be connected and supplied recycled water. This project will connect the identified sites with estimated recycled water use of 275 AFY.

Additional construction needed for the previous Mains Avenue Phase 1B Project is a 6-inch to 8-inch diameter recycled water lateral extending from Mines Avenue for 5,700 linear feet.

***City of Downey Recycled Water Expansion Project*** - Central Basin and the City of Downey are looking to construct a pipeline to expand the recycled water supply into the City. The recycled water pipeline will extend from the existing Central Basin system located on Garfield Avenue to sites located within the City.

Currently, recycled water demand is estimated to be 125 AFY. Central Basin currently has a 12-inch pipeline along a public alley and Garfield Avenue. Central Basin plans to extend a 16-inch diameter pipeline for approximately 2,250 linear feet along south boundary of Los Amigos Golf Course and Quill Drive from Garfield Avenue and Gladys Street to Old River School Road in order to connect Rancho Los Amigos Medical Center. Subsequently, to connect Apollo Park, Central Basin plans to extend a 12-inch pipeline for approximately 2,810 linear feet along Quill Drive from Old River School Road to the east side of Apollo Park.

Bundling this project with two other non-disadvantaged communities such as the City of Pico Rivera and the City of Santa Fe Springs for Proposition 1 grant funding is currently being investigated.

***City of Monterey Park Recycled Water Expansion Project*** - This project expands the recycled water system into the City of Monterey Park. Water services within the City is served by the City of Monterey Park, California Water Service Company and San Gabriel Water Company.

The expansion consists of approximately 11,500 linear feet of pipeline construction. Project Costs are estimated at \$3,675,000 for the 11,500 linear feet of pipeline construction. Planning, Design, Environmental, and Project/Construction Management are estimated at 2.5 percent, 7 percent, 2 percent and 6.5 percent of construction cost respectively. Approximately 750 AFY demand.

***Pico Rivera North Recycled Water Expansion Project*** - This project expands the recycled water system into north of Pico Rivera. Water services within the City of Pico Rivera is served by three water purveyors: 1) City of Pico Rivera; 2) Pico Water District; and, 3) The San Gabriel Valley Water Company. Water is additionally conveyed to the Rio Hondo Spreading Grounds and San Gabriel Spreading Grounds in Pico Rivera. Approximately 150 AFY demand.

The expansion on the Northern portion of the service area consists of approximately 3,000 linear feet of pipeline construction. Project Costs are estimated at \$875,000 for the 3,000 linear feet of pipeline construction. Planning, Design, Environmental, and Project/Construction Management are estimated at 2.5 percent, 7 percent, 2 percent and 6.5 percent of construction cost respectively.

***Pico Rivera South Recycled Water Expansion Project*** - This project expands the recycled water system into south Pico Rivera. Water services within the City of Pico Rivera is served by three water purveyors: 1) City of Pico Rivera; 2) Pico Water District; and, 3) The San Gabriel Valley Water Company. Water is additionally conveyed to the Rio Hondo Spreading Grounds and San Gabriel Spreading Grounds in Pico Rivera.

The expansion on the Southern portion of the service area consists of approximately 7,000 linear feet of pipeline construction. Project Costs are estimated at \$2,024,000 for the 7,000 linear feet of pipeline construction. Planning, Design, Environmental, and Project/Construction Management are estimated at 2.5

percent, 7 percent, 2 percent and 6.5 percent of construction cost respectively. Approximately 200 AFY demand.

**Projected Recycled Water Sales** – Recycled water within Central Basin’s service area is projected to increase from its current sales of about 7,647 AF to 13,911 AF by 2040. Table 7-4 shows current and projected recycled water sales through 2040. Amounts projected for Groundwater Replenishment is recycled water purchased by WRD directly from LACSD to be injected into the Montebello Forebay.

Table 7-3: Current and Projected Retailers Provided Recycled Water within Service Area (AF)

<b>Wholesale: Current and Projected Recycled Water Within Service Area</b>							
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment	2015	2020	2025	2030	2035	2040
Municipal, Industrial, and Agricultural Use	Tertiary	7,647	8,934	10,178	11,423	12,667	13,911
GW Recharge/Montebello Forebay	Tertiary	46,920	44,976	47,993	50,000	50,000	50,000
<b>Total</b>		<b>54,567</b>	<b>53,910</b>	<b>58,171</b>	<b>61,423</b>	<b>62,667</b>	<b>63,911</b>
NOTES: Municipal, Industrial, and Agricultural Use includes RW from the Central Basin RW System and the Cities of Cerritos and Lakewood.							

### 7.3.3 Potential Recycled Water Use

Recycled water use is expected to increase among cities, water agencies and businesses/industries. The increasing cost of imported water makes recycled water more desirable. Central Basin will continue to pursue cost effective projects within its service area and in partnership with neighboring agencies. Efforts are currently focused on expanding the existing regional system that Central Basin receives an incentive payment from Metropolitan for every AF delivered up to 23,000 AFY through 2017.

Although there is potential to increase recycled water use in Central Basin, there are challenges and limitations to connect new customers. These challenges include proximity to recycled water pipelines, capacity and pressure required to serve each customer, and potable to recycled water conversion costs. These challenges play a significant role in the growth of recycled water and the ability to connect new customers dictates when and how much recycled water will be used in the future.

In 2012, the Master Plan identified and prioritized areas within Central Basin’s service area where recycled water has the potential to expand. Although the Master Plan is currently being updated and could influence Central Basin’s near and long-term projections, the goal to maximize recycled water use throughout the service area will not change. Partnerships with neighboring agencies have already resulted in projects that expand the Central Basin system and sales beyond its service area limits.

### Carson Advanced Water Treatment Plant

With changing conditions in the CRA and SWP supplies, imported water has continued to be restricted. In order to maintain a sustainable water supply for Los Angeles and surrounding communities, Metropolitan is determining the feasibility of advanced water treatment of wastewater to be used for groundwater recharge in order to offset a portion of Metropolitan's imported water demand. Metropolitan has partnered with LACSD since 2010 to determine the potential demands, technical and regulatory constraints of indirect potable reuse (IPR), and to estimate costs associated with the system (Metropolitan Board of Directions Special Committee on Desalination and Recycling, March 2010). LACSD's "Status Report on Recycled Water from 2010-2011" presented the advanced water treatment concept as a 200 MGD (224,110 AFY) facility but has since been revised. Pilot scale testing of treatment systems for the demonstration facility went underway in 2010 with a \$33,000 grant from the United States Bureau of Reclamation at LACSD's Joint Water Pollution Control Plant (JWPCP) in the city of Carson. Figure 7.2 shows the JWPCP existing site outlined in yellow, the demonstration facility site, and the proposed location of a full scale plant outlined in red.



Figure 7-3: LACSD JWPCP and Potential Plant Site

On September 21, 2015, Metropolitan representatives presented the "Potential Regional Recycled Water Supply Program" to the Board's Water Planning and Stewardship Committee. The presentation detailed the potential to develop a water supply to recharge groundwater basins and increase the regions water supply portfolio with IPR similar to the Orange County Water District's Groundwater Replenishment System. The program would involve a multi-phased approach with an initial 1 MGD demonstration plant, feasibility studies for full scale facilities, and a financing plan followed by several incremental phases of full scale facilities up to 150 MGD. The full scale facility would produce up to 150 MGD of advanced treated water that would be injected into groundwater basins throughout the Los Angeles region, as shown on Figure 7.3.

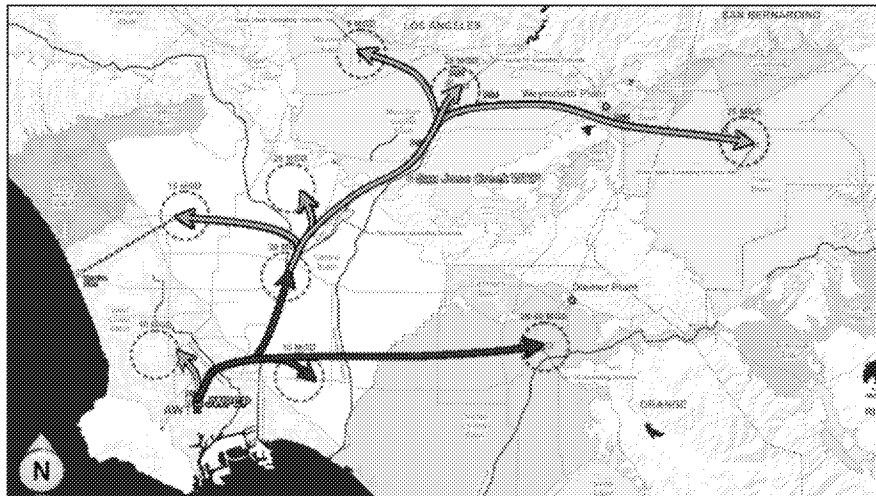


Figure 7-4: Potential Full Scale Recycled Water Program

### 7.3.4 Encouraging Recycled Water Use

Central Basin is currently working on a new recycled water campaign to increase awareness of recycled water use and its many benefits. Central Basin markets recycled water as a resource that is:

- Less expensive than potable water
- More reliable than imported water in a drought
- Consistent with state wide goals for water supply and ecosystem improvement on both the SWP and Colorado River systems

In addition to wholesaling recycled water at a rate lower than potable water, Central Basin provides other financial incentives to encourage recycled water use.

#### Optimizing Recycling Water Use

Central Basin's plan for optimizing the use of recycled water will be carried out through Central Basin's Recycled Water Master Plan update and Capital Improvement Projects Plan. The Master Plan is one of Central Basin's guiding documents for identifying and prioritizing potential customers. The 2011 Master Plan is currently being updated to capture changes in the industrial and commercial base within the service area, particularly in the northern portion to be served by SWRP.

### 7.3.5 Funding

Capital costs for projects planned over the next five years have been budgeted to an annual average of \$8 million to \$10 million. The costs will be covered by the following sources and as other sources become available:

**Metropolitan Local Resources Program Incentive** - To qualify, proposed recycled water projects by Metropolitan member agencies must cost more than projected Metropolitan treated non-interruptible water rates and reduce potable water needs. LRP incentives are provided in Section 3.6.2.



**Grant Funding** – Central Basin continuously applies for federal and state grant funding for recycled water projects as they become available. In 2005, Central Basin was awarded a \$3.5 million grant for the Southeast Water Reliability Project through the Greater Los Angeles Integrated Regional Water Management Plan. In addition, in 2009, Central Basin was awarded a \$5.6 million dollar grant from the American Reinvestment and Recovery Act (ARRA). Central Basin was awarded a State Water Resources Control Board Grant for its 2012 Master Plan Report Update. (Central Basin, Recycled Water Facilities Plan 2012 Update, 2012).

It has been part of Central Basin's Capital Improvement Plan and Recycled Water Facilities Plan (Recycled Water Master Plan) to expand the existing recycled water distribution system. Worsening drought conditions, new favorable regulations, and recently available grant funding opportunities through Proposition 1 and Proposition 84 have accelerated Central Basin's expansion efforts.

## **7.4 Recycled Water Projects within Central Basin Service Area**

### **7.4.1 City of Cerritos**

The City of Cerritos has had its own water recycling system since 1988. This 25-mile system has saved Cerritos approximately \$6 million in water costs with an initial investment of approximately \$9 million. Even though the Cerritos system is not interconnected with Central Basin's system, Cerritos is an important partner because Central Basin's system shares the Cerritos Pump Station for a portion of its recycled water supply from LACSD's Los Coyotes WRP. The Cerritos system serves on average 2,500 AFY, of which 500 AFY goes to the City of Lakewood, to approximately 230 customers within the two cities. Recycled water makes up approximately 13 percent of their total water supply portfolio.

### **7.4.2 City of Lakewood**

The City of Lakewood purchases on average 500 AFY of recycled water from the City of Cerritos to offset potable water demand.

### **7.4.3 Water Replenishment District**

WRD has been purchasing recycled water from LACSD to blend with imported water and stormwater within the recharge basins of LACDPW. LACDPW owns and operates the recharge facilities, while WRD purchases the recycled water for blending and Groundwater Basin recharge. Under the conditions of the regulatory permit from the Los Angeles Regional Water Quality Control Board, WRD was limited to spreading 35 percent recycled water over a five year period based on the total inflow of all waters (stormwater, imported water, and recycled water) entering the Montebello Forebay. Groundwater replenishment is projected to be 50,000 AFY by 2030.

In April 2014, a WRD permit was amended to increase recycled water storage for the Montebello Forebay Groundwater Recharge Project (Rio Hondo and San Gabriel Spreading Grounds) to increase the use of recycled water from 35 percent to 45 percent, potentially saving 13,150 gallons per day of imported water, enough to supply 30 households for a year (15 AFY).

WRD pursues projects through its Water Independence Now program that develops local, sustainable water sources for use in groundwater replenishment. This has become increasingly important with the issues that have limited imported water deliveries to Southern California, as well as drought conditions.

The Groundwater Reliability Improvement Program (GRIP) evaluated alternative supply sources to imported water that could replenish the Montebello Forebay. After evaluation, the selected alternative will use advanced treated municipal wastewater that undergoes microfiltration, reverse osmosis, and ultraviolet light with hydrogen peroxide for disinfection. The project will deliver the 10,000 AFY of advanced treated water from a new facility and 11,000 AFY of tertiary treated recycled water from LACSD's San Jose Creek WRP to the San Gabriel River spreading basins to meet a portion of WRD's replenishment requirements. The advanced water treatment facility will be located in the City of Pico Rivera. Preliminary studies, preparation of environmental documents, and outreach has been completed and the GRIP project is currently going through procurement.

### 7.5 Total Recycled Water Use in Central Basin

Within Central Basin's service area there are three key water recycling programs that help offset potable water use and augment replenishment water. These include the Central Basin Recycled Water System, the City of Cerritos Recycled Water Program, and WRD use of recycled water from LACSD.

## REFERENCES

California Department of Water Resources, 2015. Urban Water Management Plans, Guidebook for Urban Water Suppliers.

Central Basin Municipal Water District, 2011. Recycled Water Facilities Plan.

Central Basin Municipal Water District, 2011. Water Use Efficiency Master Plan.

Central Basin Municipal Water District, 2014. Central Basin Municipal Water District Water Supply Allocation Plan.

Department of Water Resources, 2015. State Water Project Final Delivery Capability Report 2015.

Los Angeles County Sanitation District, 2014. FY 2013-14 Annual Report on Recycled Water.

Metropolitan Water District of Southern California, 2010. Metropolitan Board of Directors Special Committee on Desalination and Recycling.

Metropolitan Water District of Southern California, 2016. Integrated Water Resources Plan 2015.

Metropolitan Water District of Southern California, 2016. Urban Water Management Plan 2015.

San Diego County Water Authority, 2003. Quantification Settlement Agreement.

U.S. Department of the Interior Bureau of Reclamation, 2012. Colorado River Basin Study.

Urban Water Management Planning Act, California Water Code § 10610-10656 (2010).

Water Conservation Act of 2009, California Senate SB x7-7, 7<sup>th</sup> California Congress (2009).

Water Replenishment District, 2005. An Introduction to the Central and West Coast Groundwater Basin.

Water Replenishment District, 2010. Regional Groundwater Monitoring Report.

Water Replenishment District, 2015. Engineering Survey and Report.

Water Replenishment District, 2015. Groundwater Basins Master Plan Draft.

# APPENDIX A

## UWMP Checklist

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# APPENDIX B

Standardized Tables

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# APPENDIX C

Notification of Public and Service Area Suppliers

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# APPENDIX D

Adopted UWMP Resolution

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# APPENDIX E

Gateway Regional Water Conservation Alliance Report

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# APPENDIX F

## Water Supply Allocation Plan

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# APPENDIX G

CUWCC BMP Report

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