APPENDIX R

Urban Water Management Plan

CITY OF OCEANSIDE

2015
Urban Water Management Plan



FINAL
June 2016

RMC
water and environment

City of Oceanside
2015 Urban Water Management Plan

Final

Prepared by:

RMC water and environment

June 2016

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LIST OF ABBREVIATIONS

2015 Guidebook	2015 Urban Water Management Plans Guidebook for Urban Water Suppliers
2015 Plan	2015 Urban Water Management Plan
AC	Asbestos cement
AF	Acre-feet
AFY	Acre-feet per year
AMI	Smart meters
AWWA	American Water Works Association
CII	Commercial, Industrial and Institutional
City	City of Oceanside
CMWD	Carlsbad Municipal Water District
CWC	California Water Code
CY	Calendar Year
DIR	Demand-initiated regenerating
DMM	Demand management measures
DOF	California Department of Finance
DSS	Decision Support System
DWR	California Department of Water Resources
ETo	Evapotranspiration
FPUD	Fallbrook Public Utility District
GHG	Greenhouse gas
GIS	Geographic Information System
GPCD	Gallons per capita per day
HE	High efficiency
IID	Imperial Irrigation District
IPR	Indirect potable reuse
IRWM	Integrated Regional Water Management
MBGPF	Mission Basin Groundwater Purification Facility
Methodologies	Methodologies for Calculating Baseline and Compliance Urban per Capita Water Use
MGD	Million gallons per day
MOU	Memorandum of Understanding
MWD	Metropolitan Water District of Southern California
NCDP	North County Distribution Pipeline
NOAA	National Oceanic and Atmospheric Administration
NSDWRC	North San Diego Water Reuse Coalition
PRS	Pressure reducing stations
QSA	Quantification Settlement Agreement
RAC	Regional Advisory Committee
RMC	RMC Water and Environment
RMWD	Rainbow Municipal Water District
RWFP	Recycled Water Facilities Plan
RWMG	Regional Water Management Group
SANDAG	San Diego Association of Governments
SBx7-7	Senate Bill X7-7

SDCWA	San Diego County Water Authority
SRTTP	South Regional Tertiary Treatment Plant
SWP	State Water Project
TCP	Trichloropropane
TSS	Total Suspended Solids
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
VID	Vista Irrigation District
WCMP	Water Conservation Master Plan
WFP	Water Filtration Plant
WRF	Water Reclamation Facility
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

ES.1 Purpose and Organization

Preparation of an Urban Water Management Plan (UWMP) is required by the California Department of Water Resources (DWR) for all urban water suppliers within the State of California. Urban water suppliers are defined as publicly or privately owned water suppliers that provide water for municipal purposes, either directly or indirectly, to more than 3,000 customers or supply more than 3,000 acre-feet (AF) of water annually. UWMPs must meet requirements established by the California Water Code (CWC) and the Urban Water Management Planning Act (Act).

This report constitutes the *2015 Urban Water Management Plan* (2015 Plan) for the City of Oceanside (City), which must be adopted by the Oceanside City Council and submitted to DWR by July 1, 2016. This 2015 Plan satisfies the requirements of the CWC, the Act, and subsequent amendments. In addition to satisfying regulatory requirements, this report is a resource document that includes an analysis of long-term water supply and demand planning for the City's service area. **Table ES-1** includes a summary of each section of this 2015 Plan.

Table ES-1: Organizational Overview of the 2015 UWMP

Section	Information Contained within Section
Section 1: Introduction and Overview	• General legal requirements for 2015 UWMPs • Local planning efforts • Plan organization
Section 2: Plan Preparation	• Plan preparation • Agency coordination and public outreach
Section 3: System Description	• Overview of City's service area and water system • Hydrologic and climate characteristics • Development within the City's service area • Current and projected population and demographic figures • Overview of potential impacts of climate change
Section 4: System Water Use	• Overview of the City's water use sectors • Information about existing and projected water use • System water losses • Water demands for lower income households • Wholesale demand projections • Climate change impacts on water use
Section 5: Baselines and Targets	• Overview of water conservation mandates • Baseline gross per capita water use • Updated target method • Urban water use targets for 2015 and 2020 • 2015 target compliance
Section 6: System Supplies	• Description of existing and projected supplies, including: o Purchased and imported water o Groundwater o Wastewater and recycled water • Description of planned future water projects • Climate change impacts to supplies

Section	Information Contained within Section
Section 7: Supply Reliability Assessment	• Constraints on each of the City's supplies • Projections for water supply and water demands under normal, single dry, and multiple dry year conditions • Regional supply reliability
Section 8: Water Shortage Contingency Planning	• Description of the City's drought ordinances • Overview of the City's water shortage stages • Prohibitions and penalties enacted during water shortages • Methods for reducing water use • Catastrophic supply interruption plan • Minimum supply available for the next three years
Section 9: Demand Management Measures	• Summary of the City's demand management measures implemented over the past five years • Summary of future DMM implementation
Section 10: Plan Adoption, Submittal, and Implementation	• Summary of 2015 Plan noticing and adoption process • Plan submittal and amendment
Section 11: References	• Full citations for references used throughout the 2015 Plan

ES.2 Service Area Background and Water Supplies

The City of Oceanside is located in northern San Diego County, encompassing approximately 42 square miles. The City is bordered by the Pacific Ocean to the west, Camp Pendleton Marine Base to the north, the City of Carlsbad to the south, and the City of Vista and unincorporated San Diego County to the east.

The City is characterized by a mild, coastal climate. Temperatures range from 54°F on average in December to 71°F on average in August. Annual precipitation averages 10.3 inches, although recent years have experienced a historically dry period, reducing average annual rainfall by as must as 52% of normal. The majority of the rainfall received occurs between January and March.

The City's current water supplies include water purchased from San Diego County Water Authority (SDCWA), groundwater, and recycled water. The City's current potable water sources include a blend of imported and desalinated seawater from SDCWA and local groundwater from the Mission Basin. Local groundwater is pumped from the Mission Basin and treated at the Mission Basin Groundwater Purification Facility (MBGPF). The primary MBGPF treatment process utilizes reverse osmosis membranes to reduce salt concentrations present in the groundwater. Recycled water is treated at the San Luis Rey Wastewater Treatment Plant (WWTP) and used for non-potable use to offset demands for potable water.

SDCWA is the regional wholesale water agency in San Diego County, and serves 24 member agencies, including the City of Oceanside. SDCWA's supply mix includes Colorado River water, State Water Project (SWP) water, and desalinated seawater. SDCWA purchases supplies from the Metropolitan Water District of Southern California (MWD), which receives its supplies primarily from the SWP and the Colorado River. SDCWA also receives Colorado River water via transfers from Imperial Irrigation District (IID) and conservation savings from several canal-lining projects. Both of these sources have become increasingly unreliable since the early 1990s as a result of significant droughts, water rights issues, and environmental restrictions. SDCWA also purchases desalinated seawater and blends it into member agency supplies.

Moving forward, the City plans to increase local supply reliability and offset demands for imported water by increasing groundwater production, expanding its recycled water distribution system, and implementing potable reuse. Wastewater from San Luis Rey WWTP would be advanced treated and stored in the Mission Basin for groundwater recharge. The potable reuse project will allow the City to expand the beneficial reuse of local wastewater and improve local supply reliability. **Table ES-2** provides a summary of the City's projected water supplies from 2020 – 2040.

Table ES-2: Summary of Projected Supplies (AFY)

Supply	2020	2025	2030	2035	2040
Purchased SDCWA Supply	24,728	24,215	22,913	23,130	23,036
Groundwater	3,300	3,700	3,700	3,700	3,700
Recycled Water (Non-Potable)	400	1,700	2,900	3,060	3,500
Advanced Treated Water (Potable Reuse)	3,300	3,300	3,300	3,300	3,300
Total	**31,728**	**32,915**	**32,813**	**33,190**	**33,536**

ES.3 Current and Projected Demands

The City's historical water demands have varied from year to year, which can be attributed to annual variations in weather, economic activity, and droughts. All urban water suppliers in California are mandated by the Water Conservation Act of 2009 (also referred to as SBx7-7) to reduce per capita potable water demands by 20% by the year 2020. For 2015, the City was required to have a per capita water use (measured in gallons per capita per day [GPCD]) of 154 GPCD. The City's actual potable water demands for 2015 were 116 GPCD, which is well below the 2015 target. Reduced demands in the City's service area are likely the result of ongoing conservation programs that have been implemented in response to the SBx7-7 legislation, as well as enhanced conservation that is currently in effect in response to a multi-year drought and associated state-mandated emergency conservation requirements. Although the demand analysis demonstrates that there is anticipated to be a rebound effect (increased demands) when the drought subsides, with existing and anticipated conservation efforts, the City is on track to meet its 2020 water use target of 137 GPCD. **Table ES-3** provides a summary of the calculated baseline and water use targets for the 2015 Plan.

Table ES-3: Baselines and Targets Summary

Baseline Period	Start Years	End Years	Average GPCD	2015 Target	2020 Target
10-15 year	1999	2008	171	154	137

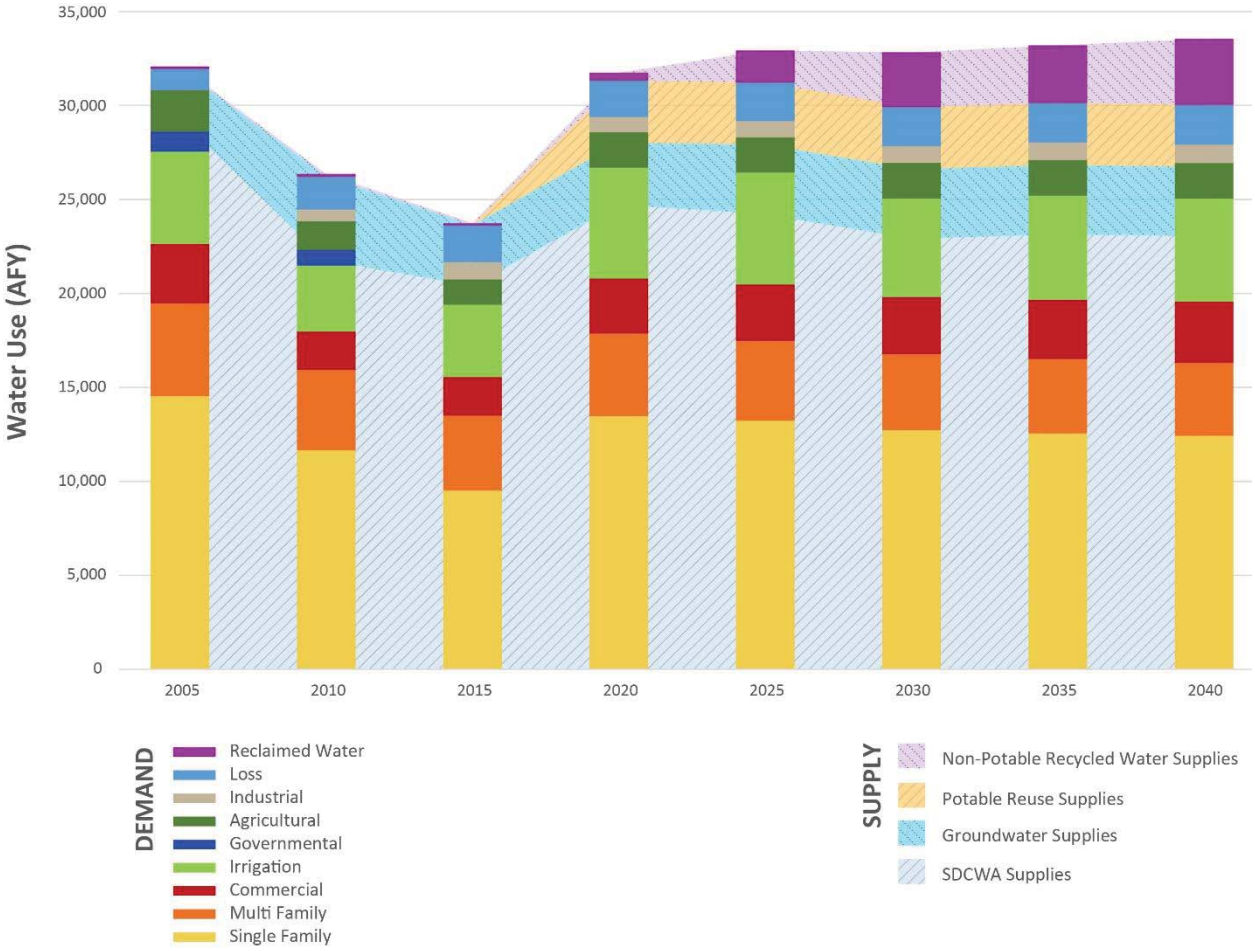
Concurrently with this 2015 Plan, the City developed the *Water Conservation Master Plan Update* (WCMP Update). As part of this effort, the City projected water use, passive conservation, and active conservation into the future. Moving forward, the City assumes implementation of aggressive water conservation, smart meters, and further implementation of recycled water conversions; together, these were considered "Program B" in the WCMP Update. Water use projections, with and without conservation savings, are shown in **Table ES-4**.

Table ES-4: Summary of Projected Demands (AFY)

	2020	2025	2030	2035	2040
Baseline Demands	33,371	36,006	37,227	38,001	38,754
Demands with Passive Conservation (Plumbing Code)	32,641	34,479	34,976	35,263	35,641
Demands with Passive and Active Conservation (Plumbing Code and Program B)	31,728	32,915	32,813	33,190	33,537

Figure ES-1 shows historical and projected water use, by use sector. Recycled (non-potable) water is also shown to provide a comprehensive image of the City's water supply portfolio.

Figure ES-1: Historical, Current, and Projected Water Use and Supply for City of Oceanside



ES.4 Water Supply Reliability

One of the key requirements of UWMPs is the inclusion of a long-term supply reliability analysis that demonstrates the supply-demand balance in normal, single dry year, and multiple dry year hydrologic conditions. Consistent with SDCWA's 2015 UWMP, the City projects increased demands (as weather conditions get hotter and drier) during single and multiple dry year scenarios.

The City anticipates no reduction of groundwater supplies for any hydrologic scenario. Groundwater is generally a drought-proof supply because the City's projected extraction is well below the normal year safe yield. Both advanced treated potable reuse supplies and tertiary recycled water supplies are drought-proof supplies that would remain available during all scenarios. Because local supplies would not increase in availability, however, the City would need to purchase additional water from SDCWA to meet demands. For all years that SDCWA projects supply reliability, the City assumes it will be able to purchase sufficient water from SDCWA to meet demands. Should SDCWA project potential supply deficits, the City would implement extraordinary conservation or convert additional customers to recycled water.

The City's water supply reliability analysis shows that with implementation of additional planned supplies and conservation measures, supplies will meet demands under all hydrologic scenarios.

ES.5 Water Shortages and Demand Management

The City has four ordinances in place that address water shortages and give the City the authority to prohibit water waste and encourage water use efficiency. Each ordinances is updated as-needed to stay current with State regulations.

- Water Conservation Program and Drought Response Conservation Measures for Mandatory Water Reductions (Ordinance No. 08-OR0439-1)
- Updates to Water Conservation Program and Drought Response Conservation Measures (Ordinance No. 15-OR0276-1)
- Water Efficient Landscaping (Ordinance No. 10-OR0412-1)
- Recycled Water (Ordinance No. 14-OR0565-1)

The City's Drought Ordinance includes a sequential, regulatory program of increasingly stringent prohibitions on the use of water delivered within the City. It establishes four levels of drought response actions to be implemented in times of shortage. When the City declares that a particular stage is in effect, City customers must comply with all regulations contained in the declared stage.

The City also engages in a variety of public education and outreach efforts to improve water use management, education, and efficiency. The City provides water conservation messaging to customers through www.SaveWaterOceanside.com, staffs a 'Save Water Oceanside' booth at community events, provides workshops on water related themes, offers two school education programs, and offers various rebates in combination with SoCal WaterSmart Program.

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SECTION 1: INTRODUCTION AND OVERVIEW

This *2015 Urban Water Management Plan* (2015 Plan) addresses the City of Oceanside (City) and includes descriptions of the water supply sources, projected water demands, and supply reliability. The Plan presents a comparison of projected water supplies to water demands during normal, single-dry, and multiple-dry years. This chapter provides an introduction to the purpose of the 2015 Plan, an overview of the Urban Water Management Planning Act (UWMP Act), and an explanation of 2015 Plan organization.

1.1 Background and Purpose

Water planning has become increasingly critical as California endures the ongoing drought and prepares for expected long-term climate changes. Prior to the adoption of the UWMP Act, water suppliers were not required to conduct long-term water resources planning, which could leave agencies vulnerable to supply disruptions during periods of drought or other supply shortages. The UWMP Act was adopted to require a minimum level of resource assessment and planning by water suppliers in order to reduce susceptibility to supply shortages. Water resources planning at the local level also allows for local community involvement and consideration of unique circumstances and local conditions of the individual agency. This 2015 Plan is an update to the City's *2010 Urban Water Management Plan*.

1.2 Urban Water Management Planning and the California Water Code

This 2015 Plan has been prepared in accordance with the UWMP Act, as amended, California Water Code (CWC) Division 6, Part 2.6, §10610 through 10657. The UWMP Act became part of the CWC with the passage of Assembly Bill 797 during the 1983–1984 regular session of the California legislature. The Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections or supplying more than 3,000 acre-feet (AF) of water annually to adopt and submit a plan every five years to the California Department of Water Resources (DWR). The Act was amended in November 2009 with the adoption of Senate Bill x7-7 (SBx7-7), which sets a goal of achieving a 20 % reduction in urban per capita water use statewide by 2020. This 2015 Plan recalibrates the baseline and targets established for SBx7-7 compliance in the City's 2010 Plan. The City will be held accountable to the targets set forth in this 2015 Plan.

This 2015 Plan has been developed in accordance with DWR's *2015 Urban Water Management Plans Guidebook for Urban Water Suppliers* (2015 Guidebook), which provides guidance to agencies on how to include the information required under the CWC, as amended. **Appendix A** includes the 2015 Guidebook's checklist indicated where each applicable section of the CWC has been addressed in this 2015 Plan. In accordance with the CWC, this 2015 Plan must be adopted and submitted to DWR by July 1, 2016. The UWMP Act states that urban water suppliers should make every effort to assure the appropriate level of reliability in its water service, such that it is sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years.

1.3 Urban Water Management Plans in Relation to Other Planning Efforts

Urban Water Management Plans (UWMPs) allow for integration of information from other planning documents, as well as regional planning efforts. This 2015 Plan synthesizes information from the City's current planning documents and compliments regional planning documents. Upon completion, the 2015 Plan will help to inform other planning decisions, such as updates to the City of Oceanside General Plan. Further, the information developed for this 2015 Plan will be used to inform and enhance the San Diego County Water Authority (SDCWA) *2015 Urban Water Management Plan*, which provides water reliability assessment for the region's water wholesaler. **Figure 1-1** provides a visual demonstration of how the City's planning documents relate to each other and to the 2015 Plan.

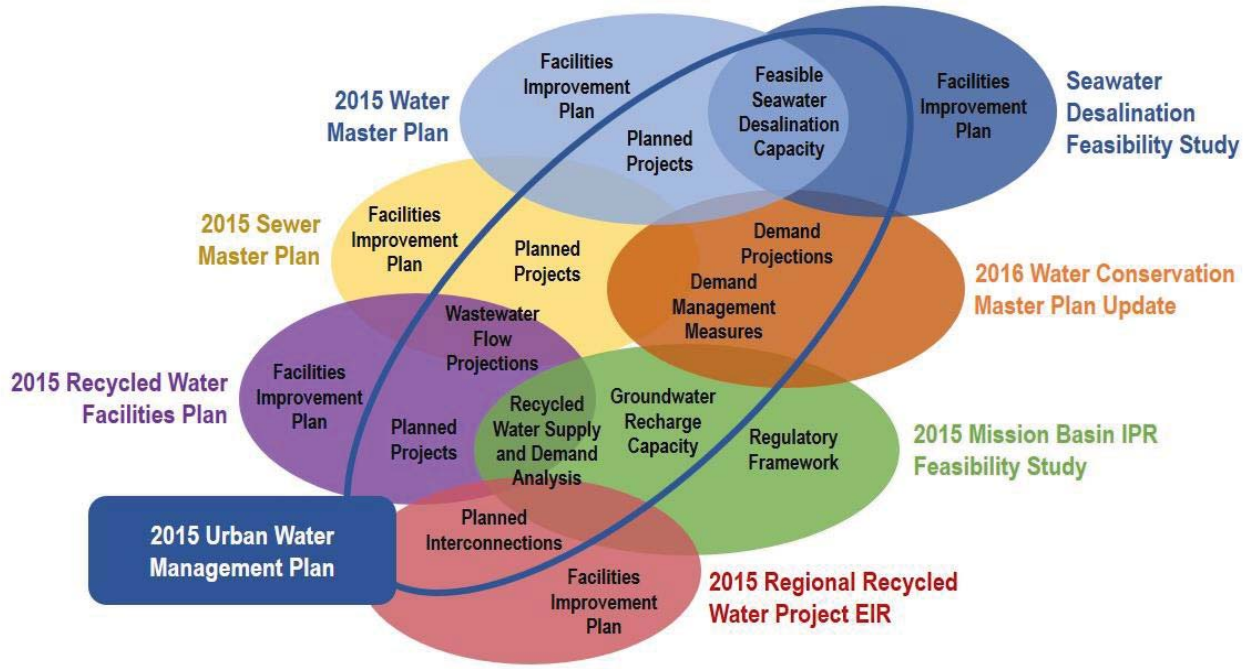
Relevant, related planning efforts include the following:

1. **City of Oceanside, *2015 Water Master Plan*:** The *Water Master Plan* aids the City of Oceanside in the planning, development, and financing of its water system and facilities, to provide reliable and enhanced service for existing customers, and to serve anticipated land use changes and growth.
2. **City of Oceanside, *2015 Sewer Master Plan*:** The *Sewer Master Plan* is used to help the City plan, develop, and finance wastewater collection facilities for existing and planned future growth. It acts as a strategic planning guide for upgrading, improving, and expanding the City's wastewater collection system
3. **City of Oceanside, *2015 Recycled Water Facilities Plan*:** The *Recycled Water Facilities Plan* is used by the City to identify cost-effective recycled water projects and develop a CIP for expansion of the City's existing recycled water system.
4. **City of Oceanside, *2016 Water Conservation Master Plan Update*:** The *Water Conservation Master Plan (WCMP) Update* provides information to the City on how best to expand existing water conservation programs in a cost-effective way, and how these programs will assist the City in meeting future water needs for its service area. The WCMP Update was developed in concert with this 2015 Plan to reflect changes in local demand and supply conditions (such as the recent drought), and help address how the City will meet State-mandated per capita reduction targets per SBx7-7.
5. **City of Oceanside, *Mission Basin Indirect Potable Reuse Feasibility Study*:** The *Mission Basin Indirect Potable Reuse (IPR) Feasibility Study* was created to investigate strategies to implement indirect potable reuse to enhance water supply reliability by recharging the Mission Groundwater Basin using advanced treated water produced by the San Luis Rey Wastewater Treatment Plant (WWTP).
6. **City of Oceanside, *2010 Seawater Desalination Pilot Facility and Feasibility Study*:** The City completed a pilot study investigating the feasibility of adding seawater desalination to its existing Mission Basin Groundwater Purification Facility, and identifying appropriate design parameters.
7. **North San Diego Water Reuse Coalition, *2015 Regional Recycled Water Project Program Environmental Impact Report*:** The North San Diego Water Reuse Coalition is a group of ten agencies located in northern San Diego County; the City of Oceanside being one of those ten agencies. The *Regional Recycled Water Project Program Environmental Impact Report (PEIR)* established the facilities associated with development of regional recycled water infrastructure and provided programmatic environmental compliance for construction

activities. The purpose of the program is to increase the capacity and connectivity of the recycled water storage and distribution systems of the Coalition members and maximize reuse of available wastewater.

8. **SDCWA, *2015 Urban Water Management Plan*:** SDCWA's *2015 UWMP* provides a description and analysis of the water supplies provided to the City by SDCWA. Regional Supply reliability is assessed in light of the blend of imported and local water supplies that SDCWA provides to its member agencies.
9. **Regional Advisory Committee, *2013 San Diego Integrated Regional Water Management Plan*:** The *San Diego Integrated Regional Water Management (IRWM) Plan* presents an overarching assessment of the San Diego region's water supply, water quality, and ecosystem challenges and provides recommendations for sustainable water management.

Figure 1-1: 2015 Plan in Relation to Other Planning Efforts



1.4 2015 Plan Organization

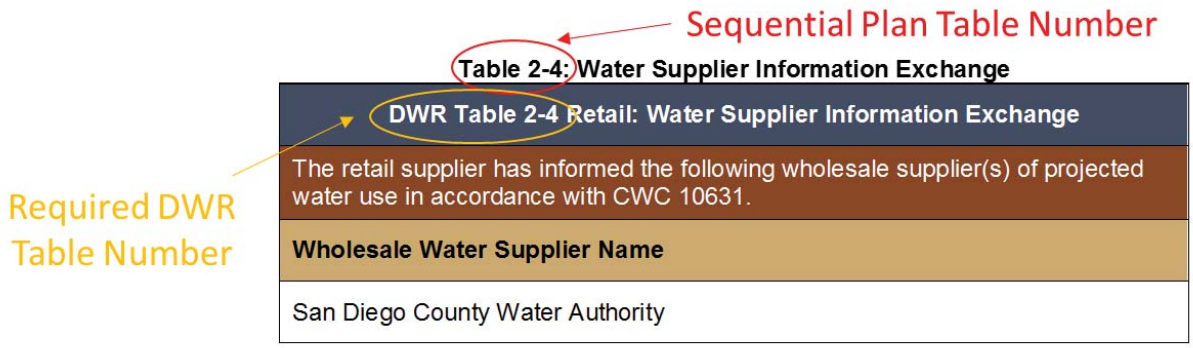
This 2015 Plan is organized into the following chapters, and generally follows the recommended outline of the 2015 Guidebook:

- Chapter 1: Introduction and Overview
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: System Water Use
- Chapter 5: Baselines and Targets
- Chapter 6: System Supplies
- Chapter 7: Water Supply Reliability

- Chapter 8: Water Shortage Contingency Planning
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal, Implementation

This 2015 Plan also includes a series of appendices intended to clarify the contents of the UWMP and to meet requirements of the CWC and 2015 Guidebook. While the 2015 Guidebook contains a series of tables that are required to be included in the 2015 Plan, the City has elected to include additional tables, as appropriate, to clarify, highlight, or otherwise present information. Tables are numbered sequentially throughout this 2015 Plan, with a special header row added for DWR-required tables. **Figure 1-2** demonstrates how tables will be presented to distinguish between DWR-required tables and those added by the City for clarity. All DWR-required tables will be presented in the body of this 2015 Plan. Both the required DWR tables and the required SBX7-7 tables have been included as **Appendix B**.

Figure 1-2: Table Presentation in 2015 Plan



SECTION 2: PLAN PREPARATION

CWC §1608.20

As defined in the California Water Code §10617, the City qualifies as an "Urban Water Supplier" because the City is a public agency directly providing water for municipal purposes to more than 3,000 customers. As such, the City is required to complete an Urban Water Management Plan (UWMP) every five years. This *2015 Urban Water Management Plan* (2015 Plan) is an update to the City's adopted 2010 Plan.

Preparation of the City of Oceanside's 2015 Plan was contracted to RMC Water and Environment (RMC), as provided for in the California Water Code §10620, paragraph (e). The 2015 Plan has been prepared in conformance with the UWMP Act, California Water Code Division 6, Part 2.6, Urban Water Management Planning.

Table 2-1, **Table 2-2**, and **Table 2-3** provide information on the City of Oceanside as a retail water agency, the water system, and how data will be reported throughout the 2015 Plan.

Table 2-1: Public Water System

DWR Table 2-1 Retail: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3710014	City of Oceanside	43,755	25,073

Table 2-2: Plan Identification

DWR Table 2-2: Plan Identification	
☑	Individual UWMP
	Regional UWMP

Table 2-3: Agency Identification

DWR Table 2-3 Agency Identification	
Name of Agency	City of Oceanside
Select one or both	
	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year	
☑	UWMP Tables are in Calendar Years
	UWMP Tables are in Fiscal Years
Units of Measure	
☑	Acre Feet (AF)
	Million Gallons (MG)
	Hundred Cubic Feet (CCF)

2.1 Agency Coordination

CWC §10620(d)(2), §10621(b), §10631(j), §10642

During the preparation of the 2015 Plan, the City coordinated information with SDCWA, the region's water wholesaler, as shown in **Table 2-4**. A list of agencies is provided in **Table 2-5**, along with their involvement with the preparation of this 2015 Plan.

Table 2-4: Water Supplier Information Exchange

DWR Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
San Diego County Water Authority

Table 2-5: Coordination with Appropriate Agencies

Organization/Agency Name	Sent 60-day UWMP Notice
Carlsbad Municipal Water District	X
City of Carlsbad	X
City of Escondido	X
County of San Diego	X
Leucadia Wastewater District	X
Metropolitan Water District of Southern California	X
Olivenhain Municipal Water District	X
Rainbow Municipal Water District	X
Rincon del Diablo Municipal Water District	X
San Diego Association of Governments	X
San Diego County Water Authority	X
San Elijo Joint Powers Authority	X
Santa Fe Irrigation District	X
U.S. Marine Corps Base Camp Pendleton	X
Vallecitos Water District	X
Valley Center Municipal Water District	X
Vista Irrigation District	X

2.2 Public Participation

CWC §10642

The City actively encouraged community participation in its urban water management planning efforts. A Public Hearing was held before the City Council on June 22, 2016, immediately prior to the City Council's adoption of the 2015 Plan. The public hearing was advertised in the North County Times twice, on June 8 and 15, 2016. Additionally, a public hearing notice was posted on the City's web site (http://www.ci.oceanside.ca.us) concurrent with release of this 2015 Plan. The 2015 Plan is available for public review at:

Water Utilities Department
Oceanside City Hall
300 North Coast Highway
Oceanside, California 92054

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SECTION 3: SYSTEM DESCRIPTION

CWC §10631; §10631(a)

The City's current water supplies include water purchased from SDCWA, groundwater, and recycled water. The City's current potable water sources include a blend of imported and desalinated seawater from SDCWA and local groundwater from the Mission Basin. Local groundwater is pumped from the Mission Basin and treated at the Mission Basin Groundwater Purification Facility (MBGPF). The primary MBGPF treatment process utilizes reverse osmosis membranes to reduce salt concentrations present in the groundwater. Recycled water is treated at the San Luis Rey WWTP and used for non-potable use to offset demands for potable water.

SDCWA is the regional wholesale water agency in San Diego County, and serves 24 member agencies, including the City of Oceanside. SDCWA's supply mix includes imported water and desalinated seawater. SDCWA purchases supplies from the Metropolitan Water District of Southern California (MWD), which receives its supplies primarily from the SWP and the Colorado River. SDCWA also receives Colorado River water via transfers from Imperial Irrigation District (IID) and conservation savings from several canal-lining projects. Both of these sources have become increasingly unreliable since the early 1990s as a result of significant droughts, water rights issues, and environmental restrictions. SDCWA also purchases desalinated seawater and blends it into member agency supplies.

The City's potable water supply system includes connections to SDCWA's aqueducts, as well as the City's MBGPF. The City has five connections with SDCWA's filtered and untreated imported water aqueducts, referred to as Flow Control Facilities (FCFs). These FCFs include connections on Pipelines No. 1 and No. 2, the CWA Tri-Agency Pipeline, and the North County Distribution Pipeline (NCDP). FCF 2, 3, and 5 connect directly with the SDCWA aqueducts and supply both potable and raw water. FCF 4 connects to the SDCWA system via the Tri-Agency Pipeline which is a 7.2 mile long pipeline that provides treated water to the City, Carlsbad Municipal Water District, Vista Irrigation District, and Vallecitos Water District. FCF 6 connects to SDCWA's regional system via the NCDP, a 4.5 mile pipeline that runs east-west between SDCWA's Second Aqueduct and the City.

The City receives both treated and untreated water from SDCWA. The City's 25 MGD Robert A. Weese Water Filtration Plant (WFP) is used to treat raw water from SDCWA to potable standards. Treated water from SDCWA is conveyed directly into the City's water distribution system. The WFP is located near the City's Connections 2, 3, and 5 to SDCWA Aqueduct 3, 4, and 5. Local groundwater is treated at the City's 6.3 MGD MBGPF. The MBGPF treats brackish groundwater extracted from the Mission Basin via eight wells owned and operated by the City. Recycled water is produced by the City at the San Luis Rey WWTP, and currently distributed via the City's non-potable water distribution system. More information on recycled water is provided in *Chapter 6 System Supplies*.

Rehabilitation of the Fire Mountain Reservoir

The City's water distribution system includes 12 storage reservoirs located throughout the water system. At least one storage reservoir is located in each of seven primary pressure zones (out of a total of 28 pressure zones). Some of the primary pressure zones have subzones that are supplied via pumping or via pressure reducing stations if the subzone ground elevations are either higher or lower than a primary pressure zone. In addition to the storage reservoirs, the City operates 9 booster pump stations, 2 water supply pumping stations, 54 pressure regulating stations, and 7 altitude valves. Potable water is distributed to customers through 574 miles of pipelines extending throughout the City and ranging from 2 to 42 inches in diameter. The majority of the piping in the system is 8 inches in diameter and is made of asbestos cement (AC) pipe.

The City's non-potable water system includes the San Luis Rey WWTP, which has a tertiary treatment capacity of 0.7 MGD and a secondary treatment capacity of 13.5 MGD. Tertiary recycled water is conveyed from the San Luis Rey WWTP to maintain the lake level at Whelan Lake and to irrigate the Oceanside Municipal Golf Course. Additional information on the City's non-potable system is provided in *Chapter 6 System Supplies*.

3.1 Service Area Physical Description

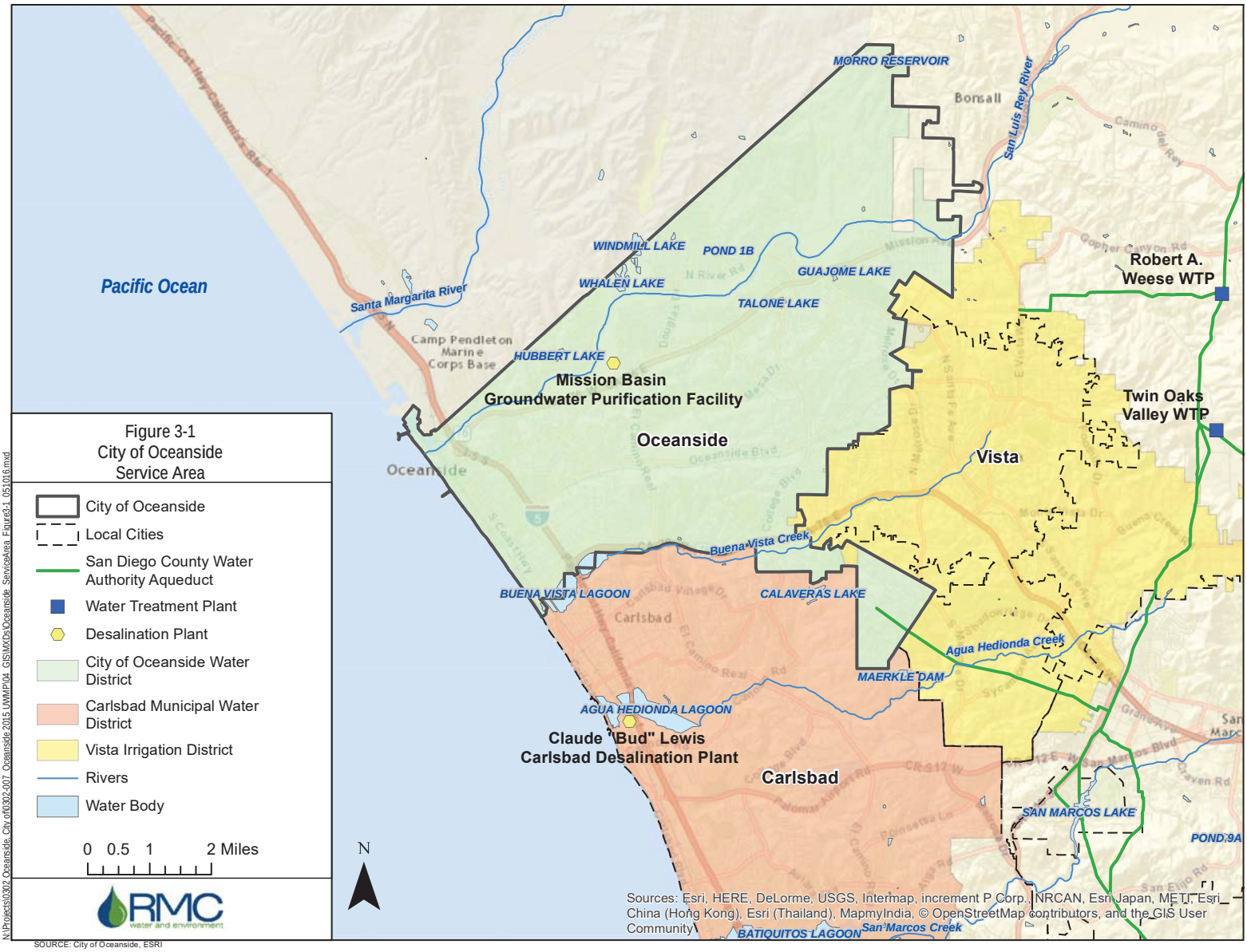
The City is located 35 miles north of the City of San Diego, and encompasses approximately 42 square miles. It is bordered on the west by the Pacific Ocean, the north by Camp Pendleton Marine Base, the south by the City of Carlsbad, and on the east by the City of Vista and unincorporated San Diego County. A map of the City and surrounding municipalities is shown in **Figure 3-1**.

3.1.1 Agency Organizational Structure

The City of Oceanside was incorporated as a general law city in 1888, pursuant to the California Constitution Article XI and the California Government Code. The City is governed by an elected five-member council. The City is a full service city, providing water and wastewater services through its Water Utilities Department, under the purview of the City Council.

3.1.2 Service Area Climate

The City of Oceanside has a mild, coastal climate. As shown in **Table 3-1**, the average annual temperature is 60ºF. Average rainfall is 10.3 inches as measured at the National Weather Service Oceanside Marina Weather Station 046377. This rainfall total is typical for Southern California, which is low compared with the national average. Recent years (2012 through 2105) have experienced a historically dry period of ongoing drought in which the City's annual rainfall fell as much as 52% of normal. Evapotranspiration (ETo) is the quantity of moisture that is both transpired by plants and evaporated by the soil plant surfaces. ETo is important to irrigation management because crop yield relates directly to ETo. Irrigators who are working to achieve maximum yields need to apply water to meet the crop's ETo demand. As shown, the largest ETo demands occur in the summer months.



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SOURCE: City of Oceanside, ESRI

Table 3-1: City of Oceanside Climate Characteristics[1]

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Average ETo Demand (in)	1.9	2.2	3.4	4.5	5.3	5.7	5.9	5.6	4.5	3.4	2.4	1.9	46.6
Average Rainfall (in)	2.6	2.9	2.1	1.0	0.2	0.1	0.1	0.1	0.2	0.7	1.1	1.9	10.3
Average Temperature (ºF)	55	55	57	60	63	66	70	71	70	65	59	54	60

Source: NOAA, 2015

[1] Normal rainfall and temperature based on 30 years of data (1981-2010), taken as the average across six weather stations in the vicinity of the City of Oceanside, as provided by NOAA, 2015.

3.1.3 Existing and Future Development within Service Area

SANDAG's Series 13 Growth Forecast found that the City's 2015 developed land use was dominated by Residential (low density, single family, multifamily, and mobile homes) at 45%, followed by Institutional (schools, roads, and parks) at 31%, Commercial (mixed use, commercial, and office) at 10%, and Industrial at 5%. The Series 13 Growth Forecast does not include agricultural land use, though a separate SANDAG analysis determined that agriculture comprised approximately 10% of 2015 developed land use. In general, the distribution of developed land use across these categories is not projected to change substantially, although residential land use is anticipated to increase by almost 750 acres between 2015 and 2040. **Table 3-2** shows the current and anticipated land use, in acres, projected for the City by SANDAG's Series 13 Growth Forecast.

Table 3-2: Current and Projected Land Use (acres)

	2015	2020	2025	2030	2035	2040	% Change (2015-2040)
Residential Land	8,998	9,488	9,634	9,675	9,712	9,741	8%
Single family	*7,761*	*8,212*	*8,322*	*8,348*	*8,354*	*8,382*	*8%*
Multifamily	*1,236*	*1,276*	*1,312*	*1,327*	*1,358*	*1,359*	*10%*
Commercial Land	1,984	1,992	1,981	1,991	2,067	2,073	4%
Industrial Land	992	893	918	946	983	986	-1%
Institutional Land	6,181	6,171	6,175	6,179	6,184	6,184	0%
Agriculture Land	2,050	2,006	2,002	1,997	2,044	2,044	0%
Total Developed Land	**20,204**	**20,550**	**20,709**	**20,787**	**20,991**	**21,030**	**4%**

Source: SANDAG, 2016

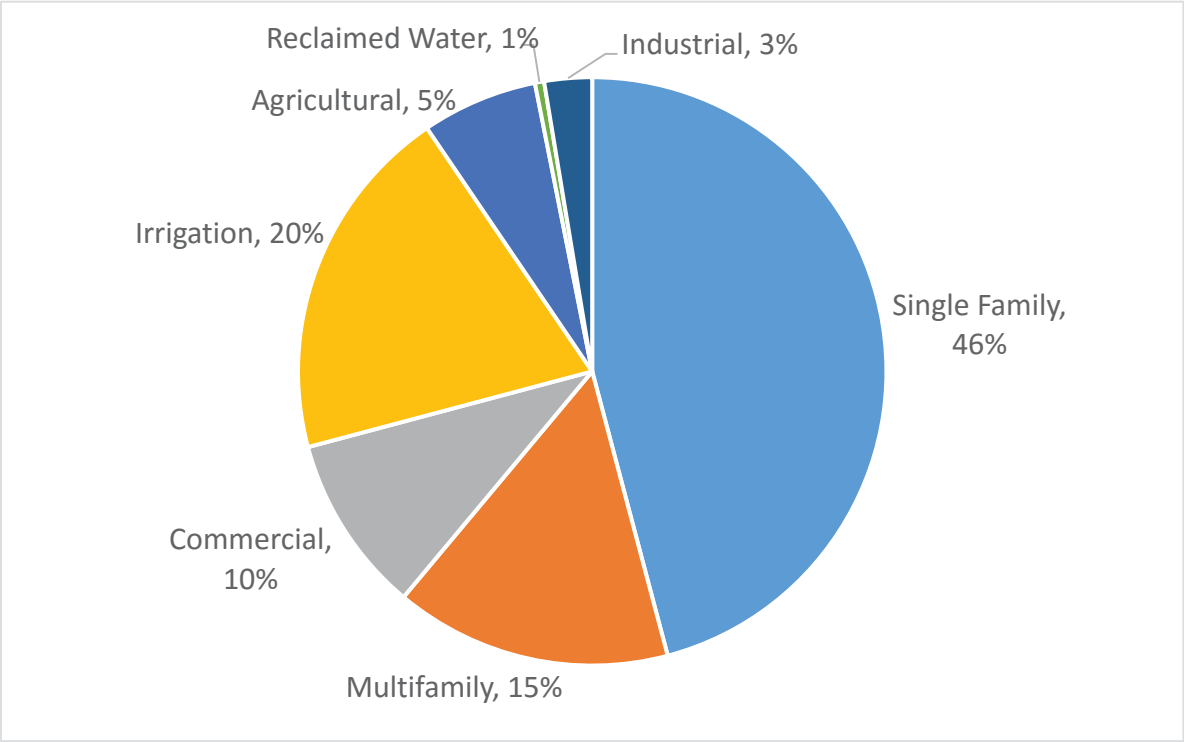
Historically, the City has included significant agricultural lands. Over the last few decades, large portions of the agricultural areas have been converted to residential planned communities. The City's *2002 General Plan* anticipated many developments and redevelopments within the planning horizon. One recent large development is the Morro Hills development that is primarily composed of new low-density residences and is nearly built out as of 2015. In addition, the El Corazon Plan and Rancho Del Oro Plan entail newer developments with significant new industrial space within the City. Additional residential, commercial, and open space are included along the periphery of these developments.

3.1.4 Overview of Water Uses in Service Area

Figure 3-2 is the average annual consumption of the various water user categories, based on average historical monthly water use and account data for years 2007 to 2011 for all customer categories. Reflecting the developed land uses described above, the largest water sector in the City is residential at 61% of the City's total water use. Single family residential customers comprise 46%, while multifamily residential customers comprise 15%. Irrigation users, which include schools, parks, and other large irrigators, make up the next largest use category at 20% of total water use. Commercial and industrial uses total 13%, and agricultural uses comprise 5%. The City's recycled water deliveries currently total less than 1% of total water use.

Figure 3-2 illustrates the distribution of water use by customer class as an average over the 5 years from 2007-2011. Note that the Fall/Olive Exchange is incorporated into single family use, and losses are excluded from the figure. An overview of these water use categories is provided in *Chapter 4 System Water Use*.

Figure 3-2: Average Annual Water Use by Customer Class 2007-2011 (Percent of Total)



3.2 Service Area Population and Demographics

Historical and projected City population estimates are shown in **Table 3-3** and **Table 3-4**, respectively. Historical data were gathered from California's Department of Finance (DOF) for the City of Oceanside (DOF 2015). Consistent with the *2015 Guidebook*, and as described in *Section 5 Baselines and Targets*, DOF projections were used because the City of Oceanside's water service area covers 95% of the City of Oceanside. Projected population for the City was determined by interpolating data from San Diego Association of Governments' (SANDAG) *Series 13 2050 Regional Growth Forecast*, provided to SDCWA member agencies for the 2015 UWMP planning process.

Table 3-3: Population – Historical

Population Served	2000	2005	2010
	161,624	166,859	167,086
Annual Increase	-	3.24%	3.58%
Source: DOF. 2015. E-8 Historical Population and Housing Estimates for Cities, Counties, and the State.			

Table 3-4: Population – Current and Projected

DWR Table 3-1 Retail: Population - Current and Projected						
Population Served	2015[1]	2020	2025	2030	2035	2040
	171,183	176,510	181,489	186,140	187,397	188,428
[1] Calculated as midpoint between the 2010 Census and 2020 SANDAG forecast Source: SDCWA. 2015. SANDAG Series 13 Growth Forecast for the City of Oceanside.						

3.3 Climate Change

The City is an active participant in the San Diego Integrated Regional Water Management (IRWM) Program. The San Diego IRWM Program updated its IRWM Plan in 2013, which included a climate change vulnerability assessment consistent with the IRWM Guidelines. This assessment has been incorporated here as **Appendix C**. For the San Diego Region, encompassing the coastal-draining watersheds in San Diego County, climate change is anticipated to result in a number of impacts that could affect the City. **Table 3-5** presents those potential regional climate change impacts that are anticipated to be realized for the City, while **Table 3-6** presents prioritized climate change vulnerabilities, adapted from the San Diego IRWM Program's climate change assessment to reflect vulnerabilities of greatest concern to the City.

Table 3-5: Potential Climate Change Impacts to the San Diego Region

Impact	Effect
Temperature	1.5°F to 4.5°F average temperature increase
Rainfall	Variable projections predict between 35% drier and 17% wetter Increase in variability between years
Supply	Up to 25% decrease in SWP supply Up to 20% decrease in Colorado River supply 164,000 acre-feet per year shortfall in imported supply
Demand	Potential 0.6% to 1.8% increase in demand by 2035
Sea level rise	12 to 18 inch rise in mean sea level rise
Wildfires	40% increase in California Coastal Shrub acreage burned in Southwestern U.S. 54% increase in overall acreage burned in Western U.S.
Source: RWMG, 2013.	

Table 3-6: City of Oceanside Climate Change Vulnerabilities

Priority Level	Category and Vulnerability Issue
Very High	Water Supply: Decrease in imported supply
High	Water Supply: Sensitivity due to higher drought potential Water Quality: Increased constituent concentrations Flooding: Increases in flash flooding and inundation (extreme weather) Ecosystem/Habitat: Decrease in available necessary habitat Sea Level Rise: Inundation of storm drains and sewer systems Ecosystem/Habitat: Decrease in ecosystem services
Medium	Water Demand: Increase in industrial demand Water Supply: Decrease in groundwater supply Water Supply: Lack of groundwater storage to buffer drought Water Quality: Increase in treatment cost Sea Level Rise: Damage to coastal recreation / tourism due to inundation Sea Level Rise: Decrease in land Sea Level Rise: Damage to ecosystem/habitat
Low	Water Demand: Increase in crop demand Water Demand: Limited ability to conserve further Water Quality: Increased eutrophication Flooding: Increases in inland flooding Ecosystem/Habitat: Increased impacts to coastal species
Very Low	Water Demand: Limited ability to meet summer demand Water Supply: Invasive species can reduce supply available Water Quality: Decrease in recreational opportunity Ecosystem/habitat: Decrease in environmental flows
Source: Adapted from RWMG, 2013.	

Because of the City's location along the coast, the region's dependence on imported supplies, and the unique biodiversity of the region, the potential effects of climate change are of great concern. To help combat the vulnerabilities presented in **Table 3-6**, a number of strategies were developed for the San Diego IRWM region, many of which are currently being implemented, or are likely to be implemented, within the City or in ways benefitting the City. The strategies identified by the San Diego IRWM region were grouped into three tiers based on level of benefit, reduction in greenhouse gases (GHG), and ease of implementation. Tier 1 strategies, representing "no regrets" strategies, identified in the San Diego IRWM Plan and applicable to the City, are presented in **Table 3-7**. Tier 2 and 3 strategies can be found in the climate change assessment included in **Appendix C**.

Table 3-7: Tier 1 Climate Change Strategies Applicable to the City of Oceanside

Strategy	Description
Reduce Water Demand	
Urban water use efficiency	Technological and behavioral improvements that decrease indoor and outdoor residential, commercial, industrial and institutional water use.
Education	Implement outreach program to educate urban and agricultural water users in water demand reduction practices.
Gray water use	Implement gray water use systems to reduce water supply demand.
Improve Operational Efficiency/Transfers	
Conveyance - Regional/local	Improvements to regional and local conveyance facilities that improve conveyance capacity.
System Reoperation	Change existing operation and management procedures for existing reservoirs and conveyance facilities to increase water related benefits from these facilities.
Increase Water Supply	
Conjunctive Management & Groundwater Storage	Coordinate and plan use and management of both surface and groundwater resources to maximize the availability and reliability of supplies.
Recycled Municipal Water	Increase supply of recycled water through additional wastewater treatment, and/or expand conveyance of recycled water to end users.
Improve Water Quality	
Drinking Water Treatment and Distribution	Develop and maintain adequate water treatment and distribution facilities, and protect the quality and safety of the raw water supply.
Groundwater/Aquifer Remediation	Remove contaminants that affect the beneficial use of groundwater. Can include passive or active methods.
Pollution Prevention	Prevent pollution of local surface waters and groundwater using tools that prevent point and non-point sources of pollution.
Salt and Salinity Management	Manage salt and salinity in surface and/or groundwater. Examples of methods include dilution and displacement, desalination, and salt collection and storage.
Urban Runoff Management	Prevent pollution of local surface waters by implementing best management practices (BMPs) designed to reduce the pollutant loading and reduce the volumes and velocities of urban runoff discharged to surface waters.
Improve Flood Management	
Flood Risk Management	Enhance flood protection through projects and programs that assist in the management of flood flows and to prepare for, respond to, and recover from a flood.
Practice Resource Stewardship	
Economic Incentives (Loans, Grants, Water Pricing)	Provide incentives such as financial assistance, water pricing, and water market policies intended to influence water management.

Strategy	Description
Ecosystem Restoration	Improve the condition of modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations.
Land Use Planning and Management	Integrate land use and water management for the planning of housing and economic development needs of a growing population while providing for the efficient use of water, water quality, energy and other resources.
Recharge area protection	Protect recharge areas to ensure that areas suitable for recharge continue to be capable of adequate recharge rather than covered by urban infrastructure, and prevent pollutants from entering groundwater.
Water-dependent recreation protection	Incorporate planning for water-dependent recreation activities in water projects, and implement projects that protect/create water-dependent recreation opportunities.
Watershed/Soils/Forest management	Create and implement plans, programs, projects and activities to restore, sustain, and enhance watershed functions, soil functions, and forests.
Water-dependent cultural resources and practices preservation	Create and implement plans, programs, projects and activities to preserve water-dependent cultural resources and practices
Increase urban forest management	Encourage the planting of trees in urban areas to improve urban water quality and local supplies.
Sea Level Rise	
Building water facilities in coordination with land use/sea level rise planning	Integrate water/wastewater resources planning with land use/sea level rise planning.
Source: Adapted from RWMG, 2013.	

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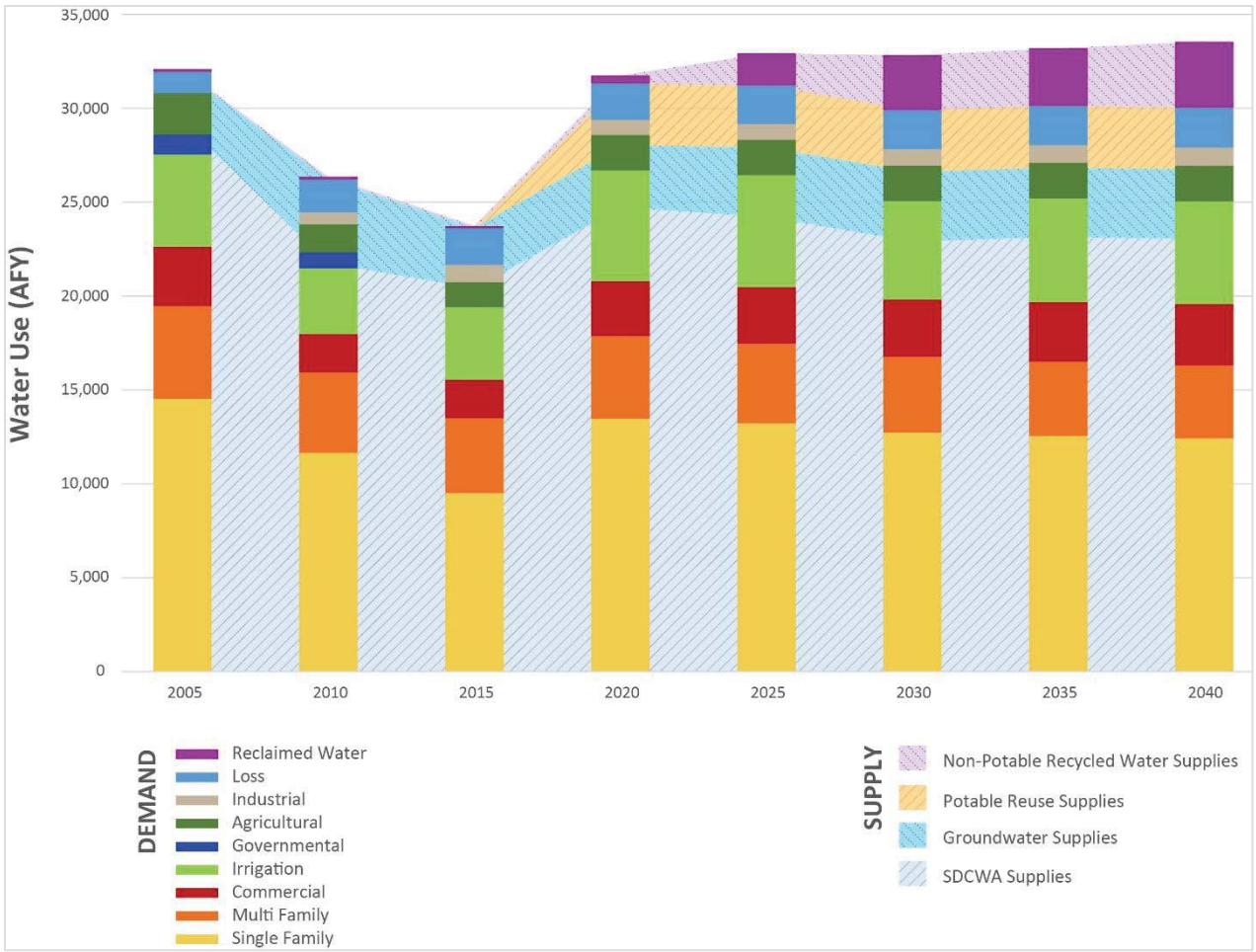
SECTION 4: SYSTEM WATER USE

This section describes the City's historic, current, and projected water use, and describes the types of water uses in the City's service area.

4.1 Water Use Sectors

The City's major water use sectors are single family residential, multifamily residential, commercial, industrial, irrigation, and agricultural, along with recycled water. Water use is dominated by residential use, followed by landscape and commercial use. **Figure 3-2** in *Section 3 System Description* provides an overview of the distribution of water use in 2015. **Figure 4-1** shows historical and projected water use, by use sector. Recycled water is shown in Figure 4-1, but discussed in greater detail in *Section 6 System Supplies*.

Figure 4-1: Historical, Current, and Projected Water Use and Supply for City of Oceanside[1]



[1]Government Sector was eliminated after 2010, and rolled into Irrigation and Commercial. Note that this figure does not distinguish indirect potable reuse from traditional potable demands. VID exchange is included in the single family residential sector.

Note that **Table 4-1**, below, lists the distribution of total water use in 2015, as reported in the discussion below.

Residential (Single Family and Multifamily)

Residential water use includes single family residential and multi-family residential water users, and includes both indoor and outdoor water use. Indoor residential water use includes sanitation, cooking, laundry, and other household water uses. Outdoor residential water use primarily includes landscaping irrigation, and generally represents a substantial portion of water use for homes with landscaping (e.g., single family residences). Residential water use represents 57% of the City's water use in 2015.

Commercial

Commercial water use includes offices, businesses, and other commercial enterprises, as well as schools, churches, and public buildings. Water use is for both indoor water use, such as for sanitation, and for outdoor irrigation. Commercial water use represents 9% of the 2015 water deliveries.

Industrial

Industrial water use includes water used for industrial processes, as well as water used for other purposes at industrial sites. The City's industrial water demands were 4% of total water deliveries in 2015.

Irrigation

The irrigation sector includes parks, roadway medians, and other sectors that use water for landscape irrigation. Some of the water needs of the irrigation sector may be met with recycled water in the future, as described in *Section 6 System Supplies*. Irrigation represented 16% of total water use in 2015.

Agricultural

The Agricultural sector, which represented 6% of potable water demands, includes water used for agricultural irrigation and other agricultural practices. Some agricultural needs may be met with recycled water in the future, as described in *Section 6 System Supplies*.

Other Water Use and Losses

Approximately 8% of total water use in the City for 2015 went to other water uses that include water losses and non-revenue water. Fiscal Year 2015 losses were calculated using the AWWA Water Loss Audit methodology (see **Appendix D**) and totaled 1,315 AF. However, the City has elected to estimate Calendar Year 2015 water losses for consistency in data reporting; estimated Calendar Year 2015 water losses were calculated as the difference between potable water production and sales. This process resulted in losses of 1,956 AF in 2015, or approximately 8% of total water use.

Water Sales and Exchanges

The City sold 5.9 AF to 16 customers in Vista Irrigation District's (VID) service area through the Fall/Olive exchange. This exchange comprised 0.02% of total water use in 2015 and is billed via the Single Family Residential sector (included in this sector in Figure 4-1).

The City also provides water treatment services to VID's raw water purchases from SDCWA at its Weese WFP. However, these water treatment services are not quantified as either a demand or supply for the City (and therefore not included in Figure 4-1 or Table 4-2). In 2015, the City treated 3,496 AF water for VID.

Recycled Water

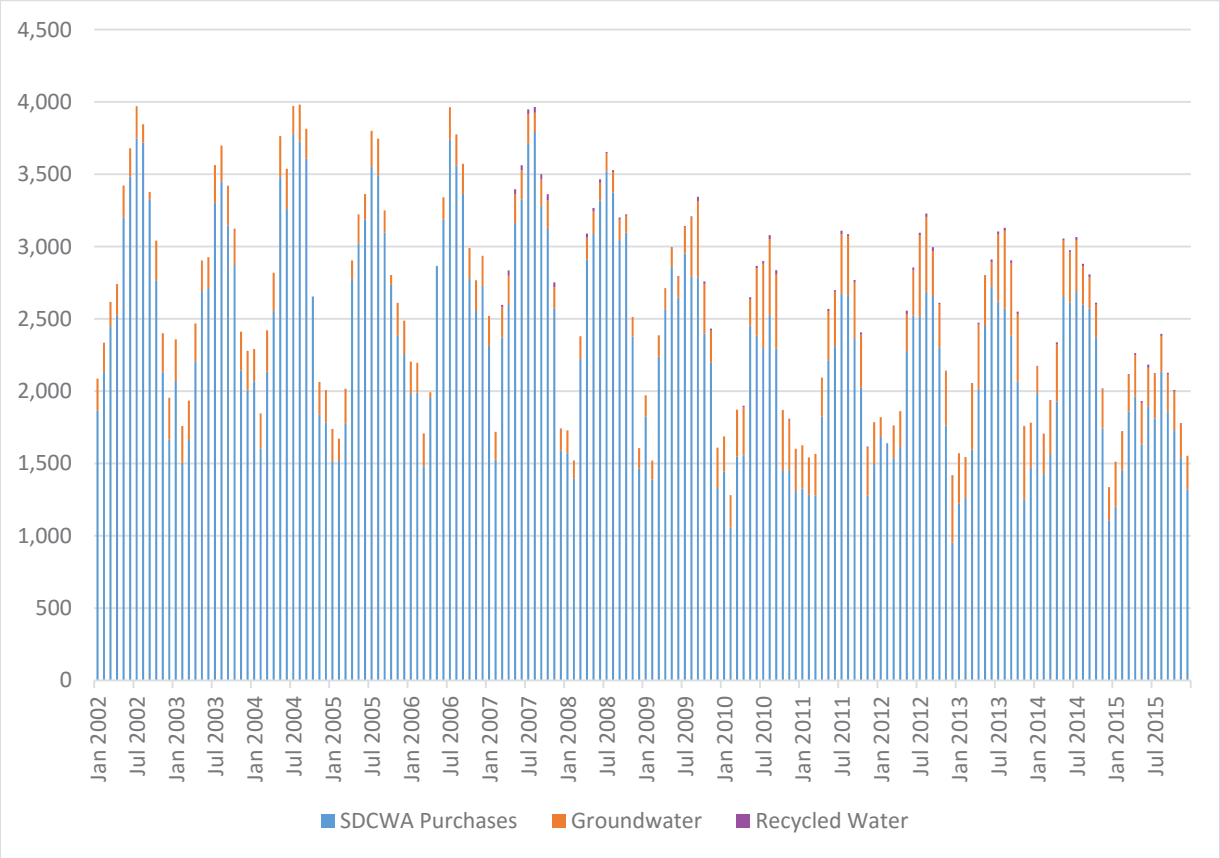
Recycled water is currently delivered for irrigation at the City's sole recycled water customer, Oceanside Municipal Golf Course. Recycled water deliveries made up 0.4% of total water use in 2015. Excess tertiary-treated recycled water is discharged to Whelan Lake, though this excess water is not metered or accounted for in the City's water use data.

4.2 Water Use and Demands

CWC §10631(e)(1), §10631(e)(2), §10631.1(a)

Historical and current water use records are maintained in the City's annual "Public Water System Statistics" reports that are submitted to DWR. **Figure 4-2** shows the City's historical water production by source over the last 14 years (2002 – 2015). For the WCMP Update, historical water production data for the City was analyzed on a monthly basis.

Figure 4-2: Total Historical Water Production Volume (AFY)



4.2.1 Demand Forecast

Table 4-1 shows the City's current water use for FY 2015. The City began breaking down billing data for the Industrial sector in 2010 and discontinued the Government sector in 2015. Accounts formerly classified as Government were converted to either Irrigation or Commercial beginning in December 2014, as appropriate. **Table 4-1** has been expanded to also show actual recycled water sales in 2015 and resulting total water use for the City of Oceanside.

In November 2013, the City began providing water to 16 homes within VID's service area through the Fall/Olive Exchange. This exchange is captured in current and projected demands reported in this 2015 Plan. The City also provides water treatment services to VID for raw water purchased from SDCWA. VID's share of the raw water is sent to the Weese WTP, where it is treated to potable standards and then conveyed to VID. This water is not part of the City's supplies or demands, and is not reported in this 2015 Plan.

Table 4-1: Demands for Potable and Raw Water – 2015 Actual

DWR Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume (AFY)
Single Family	Single family residential detached dwelling	Drinking Water	9,500
Multi-Family	More than one residential dwelling unit serviced by the meter: Duplex, townhome, condominium, apartments, mobile homes.	Drinking Water	3,982
Commercial	Non-residential domestic service	Drinking Water	2,047
Industrial	Businesses whose discharge to the wastewater system have high concentrations of BOD, TSS and /or ammonia.	Drinking Water	922
Landscape	Water only account	Drinking Water	3,856
Agricultural Irrigation	Irrigation of commercially grown crops or other dedicated agricultural connections	Drinking Water	1,345
Sales/Transfers/ Exchanges to other agencies	VID: Fall / Olive Exchange	Drinking Water	6
Losses		Drinking Water	1,955
		Total Potable Water Use	**23,613**
		Recycled Water Use	104
		Total Water Use	**23,717**
NOTES: Governmental uses were converted to either Irrigation or Commercial beginning in January 2015. The AWWA Water Loss Audit included as Appendix D was completed for FY2015 and reflects a lower loss than estimated Calendar Year 2015. Reported here is the estimated water loss for Calendar Year 2015, based on the difference between production and sales.			

Concurrently with this 2015 Plan, the City developed the WCMP Update (also available at the City's website: http://www.ci.oceanside.ca.us/gov/water/admin/uwmp.asp). As part of this effort, the City used a Decision Support System (DSS Model) tool to project water use, passive conservation, and active conservation into the future. The DSS Model prepares long-range, water demand, and conservation water savings projections. The DSS Model is an end-use model that breaks down total water consumption (i.e., water demand in the service area) into specific water end uses, such as toilets, faucets, irrigation, etc. This "bottom-up" approach allows for detailed criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The purpose of using end-use data is to enable a more accurate assessment of the impact of water efficiency programs on demand and to provide a rigorous and defensible modeling approach necessary for projects subject to regulatory or environmental review.

As part of the WCMP Update, the City chose to assume implementation of conservation "Program B" in its demand forecast, which includes aggressive water conservation, smart meters (AMI), and further implementation of recycled water conversions. Note that the demand projections reflect average water use assuming average weather conditions and do not reflect drier and hotter drought conditions. Water use projections from the DSS Model, with and without conservation savings, are shown in **Table 4-2**.

Table 4-2: Baseline and Projected Water Use (AFY)*

	2020	2025	2030	2035	2040
Baseline Demands	33,371	36,006	37,227	38,001	38,754
Demand with Passive Conservation (Plumbing Code)	32,641	34,479	34,976	35,263	35,641
Demand with Passive and Active Conservation (Plumbing Code and WCMP Program B)	31,728	32,915	32,813	33,190	33,537
*Data are not weather normalized. Total water use includes agricultural use, recycled water, and water loses.					

Water use projections (with conservation) broken out by water use sector are shown in **Table 4-3**. Consistent with changes to the City's billing categories since 2010, Governmental sector use from January 2015 was divided evenly between Commercial and Irrigation sectors. The City anticipates continuing to provide a similar level of service to VID customers via the Fall/Olive exchange at was provided in 2015. This exchange is included in the demand projections presented in **Table 4-3**. The City will continue to provide treatment services to a portion of VID's raw water purchases from SDCWA, but as noted above, this water is not included in the City's demands or supplies. As such, the water treated for VID is not included in **Table 4-3**.

The City replaced landscaping with artificial turf underneath and alongside the Oceanside Pier to reduce water use

Future Residential demands represent the projected highest water use, but the City also sells a substantial amount of Irrigation and Agricultural water. Irrigation and Agricultural water is generally used on high-value crops such as cut flowers, nursery stock, citrus, avocado, and other specialty tree crops. Users growing crops have the option of participating in the Special Agricultural Water Rate (SAWR) program, which carries a discount in exchange for doubling the risk of cutbacks in the event of shortages. Growers also can choose to take water as commercial agricultural water, but do not receive a discount and thus have the same level of service reliability as other municipal users.

Table 4-3: Demands for Potable and Raw Water - Projected

DWR Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description	Projected Water Use				
		2020	2025	2030	2035	2040
Single Family	Single family residential detached dwelling; includes the Fall/Olive Exchange	13,464	13,225	12,726	12,548	12,418
Multi-Family	More than one residential dwelling unit serviced by the meter: Duplex, townhome, condominium, apartments, mobile homes.	4,405	4,246	4,039	3,959	3,886
Commercial	Non-residential domestic service	2,920	2,986	3,028	3,150	3,265
Industrial	Businesses whose discharge to the wastewater system have high concentrations of BOD, TSS and /or ammonia.	809	850	880	928	975
Landscape	Water only account	5,888	5,967	5,248	5,541	5,467
Agricultural irrigation	Irrigation of commercially grown crops or other dedicated agricultural connections	1,889	1,888	1,895	1,895	1,895
Losses		1,953	2,053	2,097	2,109	2,131
	TOTAL	**31,328**	**31,215**	**29,913**	**30,130**	**30,037**
NOTES: Projections based on 2020 target and percentage of sector use in 2015. Governmental sector use from January 2015 was divided evenly between commercial and irrigation sectors.						

In addition to the potable water demands, the City uses tertiary recycled water. Current and projected recycled water demands are summarized in **Table 4-4**, along with current and projected potable water use. The City also plans to develop potable reuse supplies, which will serve potable demands. Per the 2015 Guidebook, potable reuse supplies are incorporated into recycled water supplies in the official DWR tables. However, to provide clarification on the actual water demands by end users, the table presented in this section does not include advanced treated potable water in the recycled water demand. Recycled water uses are discussed in more detail in *Chapter 6, System Supplies*.

Table 4-4: Total Water Demands (AFY)

DWR Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	23,613	31,328	31,215	29,913	30,130	30,037
Recycled Water	104	400	1,700	2,900	3,060	3,500
TOTAL WATER DEMAND	**23,717**	**31,728**	**32,915**	**32,813**	**33,190**	**33,537**

NOTES: Demands met by advanced treated water are included here as Potable and Raw Water demands. Non-potable recycled water demands are included here as Recycled Water demand. DWR has directed agencies to include IPR in both Potable Demands and Recycled Water Demands and Supplies. For this reason, the corresponding DWR tables in **Appendix B** counts the City's potable reuse in both Potable Water and Recycled Water Demands in this table. The City has elected to only count this water once in the body of this Plan to provide a clear understanding to the reader of the total volume of water that is projected for end uses (including loss).

4.2.2 Distribution System Water Losses

CWC §10631(e)(1), §10631(e)(3)

Water loss is composed of apparent water losses and real water losses. Apparent losses are attributed to unauthorized consumption, customer metering inaccuracies and system data handling errors, while real losses are attributed to leakage along the pipe system, at the storage tanks, or at the service connections. The City has been quantifying water loss using the American Water Works Association (AWWA) water system balance methodology since fiscal year 2010. The City's AWWA water loss summary report for the most recent 12-month period was produced for FY 2014/2015 and is included as **Appendix D**. The water loss calculated for FY 2014/2015 is shown in **Table 4-5**. However, the City has elected to use an estimate of calendar year 2015 water loss, calculated as the difference between production and delivery, based on billing data. This allows for consistency across data presented in this 2015 Plan. Calendar year 2015 water losses were estimated at 1,955 AF.

Table 4-5: Water Loss Summary Most Recent 12 Month Period Available

DWR Table 4-4 Retail: Water Loss Summary Most Recent 12 Month Period Available	
Reporting Period Start Date (Month/Year)	**Loss (AFY)**
July 2014	1,316

NOTES: The City has elected to use estimated water losses in its 2015 demand tables for Calendar Year 2015. This was estimated as the difference between production and water use, based on water purchases, well production logs, and billing data for Calendar Year 2015. Calendar year 2015 water losses were estimated at 1,955 AF.

4.2.3 Low Income Water Use and Demands

CWC §10631.1(a)

DWR requires that agencies estimate the projected water use for single-family and multifamily residential housing needed for lower income households within their service area. DWR defines lower income households as those with a median household income (MHI) earning less than 80% of area MHI. Per the City's 2013 General Plan Housing Element, low income households are those earning $65,500 or less.

SANDAG's Series 13 Regional Growth Forecast includes projected number of households by income tiers of $15,000. In 2012, 45% of households in the City earned less than $60,000. Household projections from SANDAG were available for 2012, 2020, 2035, and 2050. The City assumed a straight-line projection in household growth between these years to estimate total households for 2015, 2025, 2030, and 2040. The City's Inclusionary Housing Ordinance (Municipal Code Chapter 14C) requires developments of three or more units include affordable housing equal to 10% of the total units developed, with some exceptions. Assuming that 10% of the overall increase in households will be low-income, the City has projected its low income households from 2015 to 2040, as shown in **Table 4-6**. Assuming that a given household will use approximately the same amount of water as another given household in the same billing category regardless of income level, the City is able to estimate the projected low income water use for multi-family and single-family residential demands, as shown in **Table 4-6**.

Table 4-6: Low-Income Projected Water Demands (AFY)

	2015[1]	2020	2025[1]	2030[1]	2035	2040[1]
Total Households	*60,744*	*61,902*	*63,058*	*64,214*	*65,370*	*65,540*
Low Income Households[2]	**26,882**	**26,995**	**27,110**	**27,226**	**27,341**	**27,358**
Low Income Water Demands (AFY)[1]	5,966	7,792	7,511	7,108	6,904	6,806
Low Income Multi-Family Demands[1]	1,761	1,921	1,825	1,712	1,656	1,622
Low Income Single-Family Demands[1]	4,205	5,871	5,686	5,396	5,248	5,184

[1]Estimated
[2]Calculated as existing low-income households plus 10% of household growth

4.2.4 Estimating Water Savings from Codes, Ordinances, or Transportation and Land Use Plans

CWC §10631(e)(4)

The City has a number of conservation measures in effect at all times, and implements additional ones in the event of a drought declaration, as described in *Section 8 Water Shortage Contingency Plan*. In addition, the City's mandatory use ordinance means that projected recycled water use is considered a verifiable supply because users will be required to convert to recycled water as it becomes feasible to connect. Further, recent changes to the State's plumbing and building codes will reduce domestic water demands by requiring installation of water efficient fixtures and other features. These statewide changes include, but are not limited to, AB 715 (efficient toilets and urinals) and SB 407 (retrofitting for efficient fixtures). Conservation efforts are included in the projected demands, as are lower income residential demands, as indicated in **Table 4-7**.

Table 4-7: Inclusion of Estimated Water Savings in Water Use Projections

DWR Table 4-5 Retail Only: Inclusion in Water Use Projections	
Future Water Savings Included Y/N	Yes
If "Yes" to above, state the section or page number where citations of the codes, ordinances, etc… utilized in demand projections are found.	Location in UWMP: Section 4.2.5; Section 6.8.3; Section 8
Lower Income Residential Demands Included	Yes

4.3 Wholesale Water Demand Projections

CWC §10631(k)

Approximately 86% of the City's water is purchased from the SDCWA. In the future, the City plans to use more water from local sources such as the Mission Basin, desalinated water, and recycled water (including potable reuse), thereby lessening the need for SDCWA purchases. Agency demand projections provided to SDCWA are shown in **Table 4-8**. Note that the City's projected demands on SDCWA may be different from those reported in SDCWA's UWMP due to differences in demand forecast assumptions and methodology.

Table 4-8: Agency Demand Projections Provided to Wholesale Supplier (AFY)

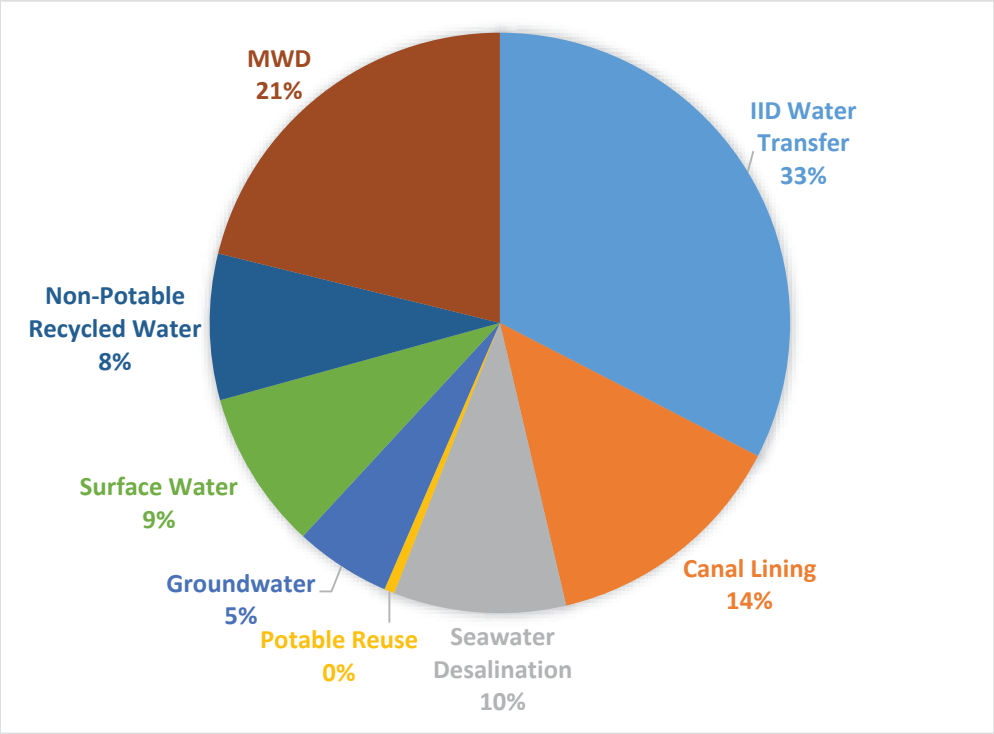
Wholesaler	2015	2020	2025	2030	2035	2040
SDCWA	20,400	24,728	24,215	22,913	23,130	23,037

SDCWA purchases imported water from three main sources: MWD, conserved agricultural water from IID, and conserved water from projects that lined the All-American and Coachella Canals. SDCWA has also acquired spot water transfers to offset reductions in supplies from MWD during water shortage years. In addition to imported water, SDCWA's supply mix includes desalinated seawater produced at the Claude "Bud" Lewis Carlsbad Desalination Plant (Carlsbad Desalination Plant). This desalinated water, discussed in further detail in *Chapter 6 System Supplies*, was delivered to SDCWA member agencies as part of SDCWA's supply mix beginning at the end of 2015. A five-year average (2011-2015) of SDCWA's supply mix shows 20% of its supply is imported from SWP through MWD, 64% from the Colorado River via MWD and long-term transfers, and 16% from local supplies.

4.3.1 Wholesale Water Use Reduction Plan

The SDCWA Board approved a strategy to aggressively diversify its water supply portfolio by developing new local and imported water supplies. This strategy already is enhancing regional supply reliability. By fiscal year 2010, the San Diego region had reduced its reliance on MWD supplies to 50%. This lessened the impact of water cutbacks from MWD that began in July 2009. SDCWA is working with its 24 local member retail agencies to develop local supplies such as groundwater, recycled water, seawater desalination, and conservation. By 2020, SDCWA projects local water supplies to meet 33% of the region's water demand. Member agency local supplies and SDCWA's supplies independent of purchases from MWD are projected to meet 79% of demands by 2020 (see **Figure 4-3**). SDCWA also partners with its member agencies to promote conservation and conservation education through its WaterSmart programs (www.watersmartsd.org).

Figure 4-3: Projected 2020 Regional (SDCWA) Supply Mix



Source: SDCWA 2015 UWMP.

4.4 Climate Change

As described in *Section 3 System Description*, the City faces demand vulnerabilities as a result of potential impacts from climate change. The San Diego Region identified three water-demand related vulnerabilities. **Table 3-5**, above, summarizes those water demand vulnerabilities applicable to the City. The City anticipates that potential impacts of climate change could increase demands in the industrial and agricultural sectors. Industries may require additional water for cooling processes. As shown in **Table 4-3**, industrial water use is anticipated to increase over time as industry grows. If climate change increases water intensity of industrial processes, the City's projections for this water use category could be lower than actual demands. Agricultural water uses in the City are anticipated to remain fairly consistent over time. However, these demands could change substantially as a result of climate change. Water demands for agricultural irrigation may increase as temperatures rise and precipitation patterns change. On the other hand, they may decrease if climate change contributes to conversion of agricultural land to other uses. On-going extended droughts, or the perceived risk of increased drought intensity and frequency, may increase the rate of agricultural land conversions, which would decrease agricultural water demands. At the same time, other categories of water use would increase.

Anticipated temperature rises could contribute to increases in domestic water demands, though these demand increases could be tempered with long-term passive savings achieved through conversion of turf to water-wise landscaping that has been occurring through the current drought. The present drought has also resulted in temporary reduction of demands; however, this is anticipated to rebound. It is evident that short-term demand decreases are achievable, but long-term calls for conservation in the light of hotter summers and greater variability in precipitation could lead to a perceived inability for further demand reduction.

SECTION 5: BASELINES AND TARGETS

The Water Conservation Act, also known as SBx7-7, was adopted in 2009, requiring the State to reduce urban water use by 20% by the year 2020. SBx7-7 requires each retail urban water supplier to set water use reduction goals to assist in achieving the statewide 20% reduction. To measure progress towards meeting their 2020 targets, DWR requires agencies to meet an interim target in 2015, the halfway point between the baseline and the target year (2020). This chapter establishes the City of Oceanside's baseline periods and water use targets in accordance with SBx7-7, service area population, gross water use, and confirms compliance with the 2015 interim target. All required SBx7-7 tables are included as **Appendix B**.

5.1 SBx7-7 Baseline

To establish the SBx7-7 baseline, the City first recalibrated its service area population for potential baseline years, using 2010 U.S. Census data. A baseline period was selected, gross water use for the baseline period added, and water use in gallons per capita per day (GPCD) was calculated. Baseline information is presented in **Table 5-1**, below.

5.1.1 Service Area Population

CWC §10608.20 (e), §10608.20 (f)

The City's service area population estimates were updated in this 2015 Plan using the 2010 U.S. Census data to provide correct annual GPCD calculations. A Geographic Information System (GIS) analysis found that the City provides 95% of its service area with water services, which allows it to use California Department of Finance (DOF) population projections for its service area data. These population projections are presented in **Table 5-1**, below.

5.1.2 Baseline Periods

CWC §10608.12(b), §10608.20(e), §10608.20(g), §10608.22

SBx7-7 requires agencies to determine their baseline per capita water use and calculate their 2020 target water use per the *Methodologies for Calculating Baseline and Compliance Urban per Capita Water Use* (*Methodologies*). Baselines are determined by averaging the historical per capita water use of 10 to 15 consecutive years. Agencies may update their urban water use targets in the 2015 Plan by adjusting the years selected for their baseline periods and updating service area population data. Per the Methodologies, the City is required to use a 10 year base period because their 2008 recycled water use, 66 AF, was less than 10% of its 2008 measured retail water demand. Based on analysis of potential baseline periods, the City selected a 10-year baseline period from 1999 to 2008. The per capita water use for each base period year is shown in **Table 5-1**. The City's daily system gross water use is the sum of the water purchased and produced each year, with agricultural water use excluded. Annual daily per capita water use for each year, determined by dividing gross water use by population, was averaged to determine the baseline daily per capita water use of 171 GPCD.

According to SBX7-7, the water use reduction must meet a minimum of 95% of the City's baseline per capita use for a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010. As displayed in **Table 5-1**, the City's 5-year baseline for 2004 through 2008 is 172 GPCD, therefore, the 2020 target must reduce water consumption to at least 163 GPCD.

5.1.3 Gross Water Use

CWC §10608.12, California Code of Regulations Title 23 Division 2 Chapter 5.1 Article

Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period. **Table 5-1** shows the annual gross water use for each year of the 10-year baseline period from 1999 to 2008, as well as the 5-year baseline period from 2004 to 2008. This table also shows the GPCD for each year in the 5-year and 10-year baseline periods, which were then averaged to establish the 2020 and interim 2015 water use targets.

Table 5-1: Annual Gross Water Use

SBX7-7 Table 4 Annual Gross Water Use; SBX7-7 Table 5: Gallons Per Capita Per Day (GPCD)[1]						
Baseline Year		**Volume Into Distribution System**	**Agricultural Use**	**Annual Gross Water Use[2]**	**Service Area Population**	**Daily Per Capita Water Use**
10 to 15 Year Baseline - Gross Water Use						
Year 1	1999	33,254	2,330	30,924	158,451	174
Year 2	2000	33,862	2,719	31,142	161,624	172
Year 3	2001	32,141	2,369	29,772	162,907	163
Year 4	2002	35,467	3,255	32,211	164,312	175
Year 5	2003	32,844	2,480	30,364	165,962	163
Year 6	2004	35,169	2,408	32,760	166,859	175
Year 7	2005	33,611	2,221	31,391	166,958	168
Year 8	2006	34,311	2,530	31,781	165,539	171
Year 9	2007	35,585	2701	32,884	165,545	177
Year 10	2008	33,050	1795	31,255	166,064	168
10 year Baseline Average Gross Water Use				**31,448**	**-**	**171**
5 Year Baseline - Gross Water Use						
Year 1	2004	35,169	2,408	32,760	166,859	175
Year 2	2005	33,611	2,221	31,391	166,958	168
Year 3	2006	34,311	2,530	31,781	165,539	171
Year 4	2007	35,585	2701	32,884	165,545	177
Year 5	**2008**	**33,050**	**1795**	**31,255**	**166,064**	**168**
5 Year Baseline Average Gross Water Use				**32,014**	**-**	**172**
2015 Compliance Year - Gross Water Use						
2015		23,613	1,345	22,268	171,183	116

NOTES: In order to not artificially lower gross water use, recycled water was not reported here. The Water Code Section 10608.12(g) defines "Gross Water Use" as the total volume of water, whether treated or untreated, entering the water distribution system of an urban retail water supplier, excluding recycled water, the net volume of water that is placed into long-term storage, the volume of water that is conveyed for use by another water supplier, and the volume of water delivered for agricultural use.

[1] This table consolidates SBX7-7 Tables 4 and 5. A full set of SBX7-7 tables has been provided in **Appendix B**.

[2] Some differences may occur due to rounding.

5.1.4 Baseline GPCD Water Use

CWC §10608.12(b)

Table 5-1, above, shows the 10-year and 5-year baselines established for the City. The 10-year baseline was determined from gross water use for the years 1999-2008 and results in 171 GPCD; this is the value that must be reduced by 20% by 2020 (137 GPCD). The City's 5-year baseline was determined from gross water use for the years 2004-2008 and results in 172 GPCD; this is the value at which 95% would comprise the City's maximum 2020 target (163 GPCD). If the City's calculated 2020 target (20% reduction from the 10-year baseline) is higher than 95% of the 5-year baseline, the lower number must be used as its 2020 target. The lower of the two numbers is the "confirmed 2020 target". As such, the City's calculated 2020 target is 137 GPCD. The following section addresses the City's compliance with its water use targets.

5.2 2015 and 2020 Targets

CWC §10608.20(b), §10608.20(e), §10608.20(g), §10608.22, §10608.24(a), §1060 8.40

SB X7-7 requires urban water suppliers to establish per capita water use targets by using one of four methods:

- **Method 1:** A per capita water use by 2020 that is 80% of the urban retail water supplier's baseline per capita daily water use. The City's baseline is 171 gallons per capita per day (GPCD). The resulting per capita demand target for 2020 is 137 GPCD (reduction of 20% from baseline), with an interim 2015 target of 154 GPCD (reduction of 10% from baseline).
- **Method 2:** The per capita daily water use that is estimated using the sum of several defined performance standards. This method requires quantifying the landscaped area and the baseline commercial, industrial, and institutional (CII) use.
- **Method 3:** 95% of the applicable state hydrologic region target, as set forth in the 2015 Guidebook (DWR, 2016). Oceanside, located in DWR's South Coast Hydrologic Region Number 4, has a year 2020 target of 95% of 149 GPCD, which is 142 GPCD.
- **Method 4:** A provisional method that was developed by DWR where the target is based on indoor residential, CII, outdoor, and water loss components. Using the Provisional Method 4 Target Calculator provided by DWR with a CII water use in 2003 of 2,989 ac-ft gives a 2020 target of 151 GPCD.

Table 5-2 shows the 10-year baseline and the 2020 target, as determined through Method 1. The City's 2020 target is 137 GPCD, calculated as a reduction of 20% from the baseline 171 GPCD. The 2020 target must reduce Oceanside's 2020 water use by a minimum of 5% from the 5-year baseline. The 5-year baseline GPCD, the maximum 2020 water use target (calculated as 95% of the 5 year baseline GPCD), the calculated 2020 target, and the confirmed 2020 target are also shown in **Table 5-2**. This confirms that the 2020 target is sufficient. As seen, the 2020 target is well below the maximum 2020 target of 163 GPCD. The 2015 target was calculated as 154 GPCD, or the average between the 10-year baseline and the City's 2020 target. The interim 2015 target is presented in **Table 5-2**, which is significantly lower than the 2015 actual of 116 GPCD due to current conservation activities. **Table 5-3** provides a summary of the City's baselines and targets under SBx7-7.

Table 5-2: Confirm Minimum Reduction for 2020 Target

10-15 Year Baseline GPCD	Calculated 2020 Target GPCD	5 Year Baseline GPCD	Maximum 2020 Target[1]	Confirmed 2020 Target GPCD	Interim 2015 Target GPCD
171	137	172	163	137	154[2]

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD
[2] The interim 2015 target represents a 10% reduction from the calculated baseline.

Table 5-3: Baselines and Targets Summary

DWR Table 5-1 Baselines and Targets Summary					
Baseline Period	Start Years	End Years	Average GPCD	2015 Interim Target	Confirmed 2020 Target
10-15 year	1999	2008	171	154	137
5 Year	2004	2008	172		

5.3 Water Conservation Target Compliance

CWC §10608.12(e), §10608.20(e), §10608.24(a), §10608.24(d)(1)

As noted above, water suppliers are required to calculate their actual 2015 GPCD to assess their progress toward their 2020 target and determine whether they have met the 2015 interim target. As shown in **Figure 4-1** (refer to *Section 4 System Water Use*), overall water use has declined in recent years. Based on 2015 gross water use and estimated population, and as shown in **Table 5-4**, the City of Oceanside's 2015 actual water use is 116 GPCD. The City has therefore met its 2015 interim water use reduction target and is making substantial progress toward its 2020 target. Water use in 2015 was below the City's 2020 target, in part due to extraordinary conservation implemented in response to drought conditions. Although the City anticipates water use to rebound once drought response measures are lifted, it still anticipates meeting its 2020 target. Because the City met its 2015 interim target, no optional adjustments were made to its 2015 GPCD.

Table 5-4: 2015 Compliance

DWR Table 5-2: 2015 Compliance								
		Optional Adjustments to 2015 GPCD						
Actual 2015 GPCD	2015 Interim Target	Extraordinary Events	Economic Adjustment	Weather Normalization	Total Adjustments	Adjusted 2015 GPCD	2015 GPCD	Did Supplier Achieve Targeted Reduction for 2015?
116	154	-	-	-	-	116	116	Yes

NOTES: the City was within its 2015 Interim Target prior to adjustments made for extraordinary events, economic adjustments, or weather normalization. No adjustments were made.

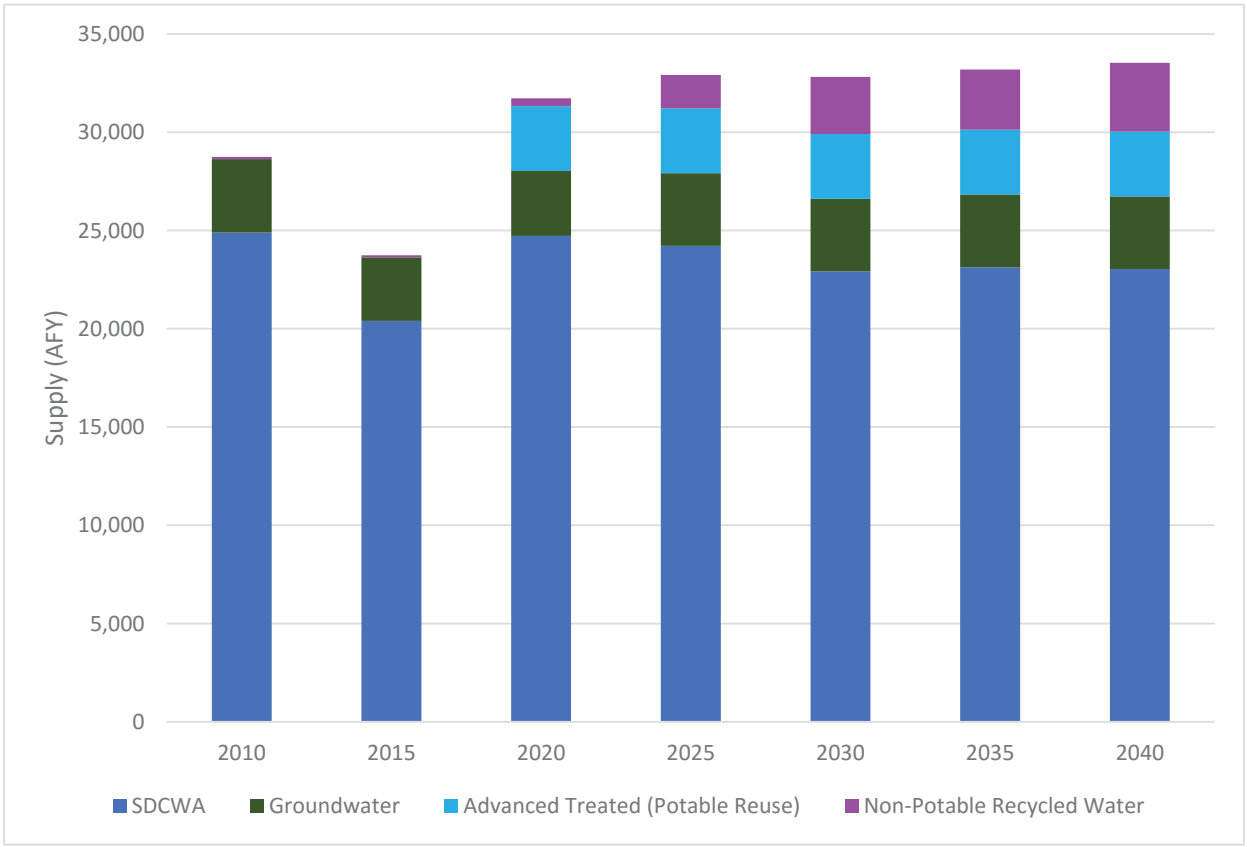
SECTION 6: SYSTEM SUPPLIES

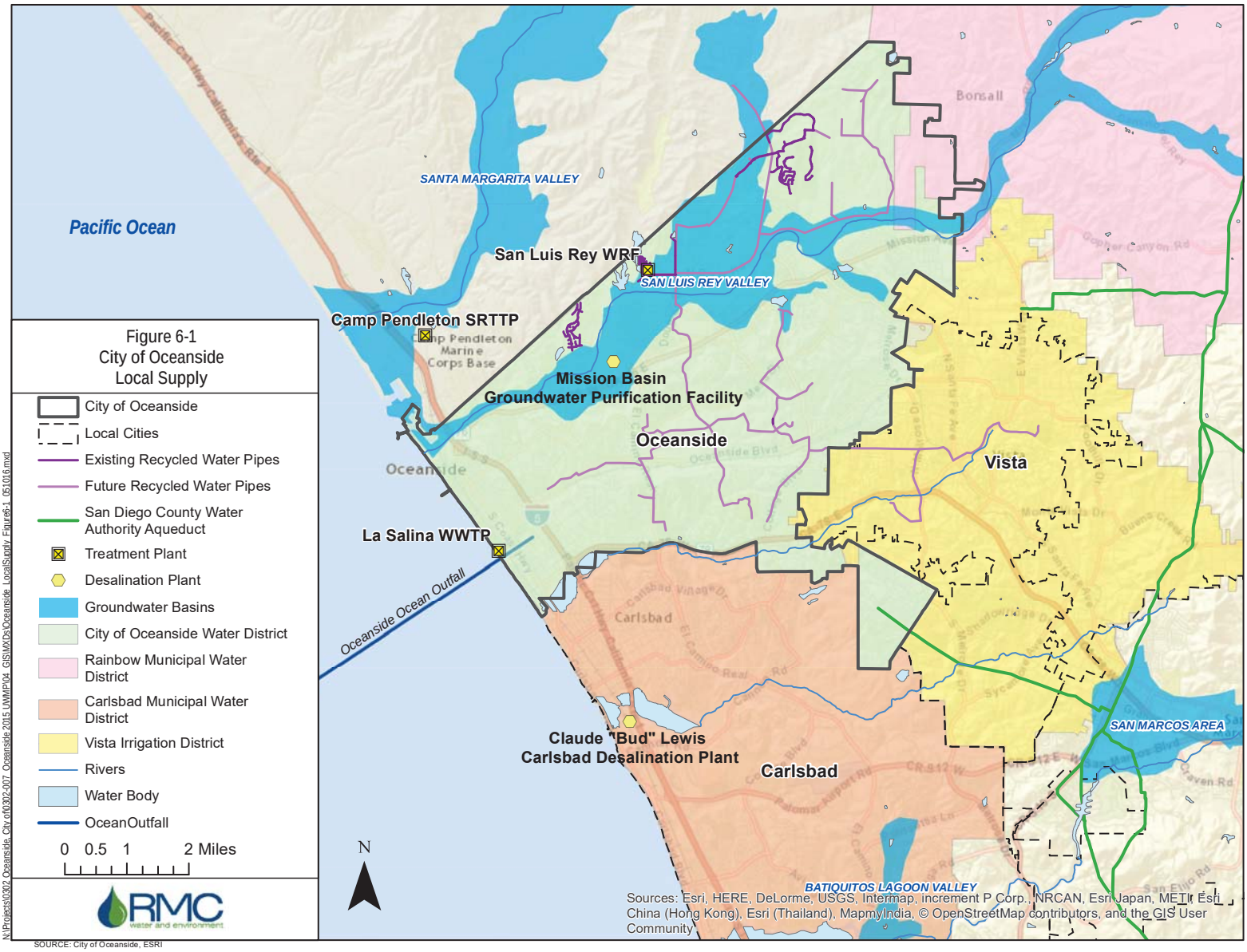
This section addresses the historical, current, and projected supplies available to the City to meet demands discussed in *Section 4 System Demands*. As described in this section, the City relies on three major supply sources: SDCWA purchases, desalinated groundwater, and recycled water. One potential additional supplies is currently in development: advanced treated water via potable reuse. **Figure 4-2** shows monthly water production data for the last 14 years (2002 – 2015). **Table 6-1** and **Figure 6-2** provide a summary of the City's existing and projected water supplies from 2010 – 2040. A map showing the location of the City's local supplies is shown as **Figure 6-2**.

Table 6-1: Summary of Historical and Projected Supplies (AFY)

Supply	2010	2015	2020	2025	2030	2035	2040
Purchased SDCWA Supply	24,897	20,400	24,728	24,215	22,913	23,130	23,037
Groundwater	3,732	3,213	3,300	3,700	3,700	3,700	3,700
Recycled Water (Non-Potable)	119	104	400	1,700	2,900	3,060	3,500
Advanced Treated Water (Potable Reuse)	0	0	3,300	3,300	3,300	3,300	3,300
Total	**28,748**	**23,717**	**31,728**	**32,915**	**32,813**	**33,190**	**33,537**

Figure 6-1: Historical and Projected Supply Mix (AFY)





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SOURCE: City of Oceanside, ESRI

6.1 Summary of Existing and Planned Water Sources

CWC §10631(b)

The City currently has two direct sources of potable water: a blend of imported and desalinated seawater from SDCWA and local groundwater from the Mission Basin of the Lower San Luis Rey River Valley. SDCWA imported water supply is sourced from the SWP via MWD and the Colorado River via transfers from IID and conservation savings from several canal-lining projects. SDCWA also purchases desalinated seawater and blends it into member agency supplies. The City operates well fields that deliver raw groundwater to the MBGPF. Recycled (non-potable) water supply is produced at the San Luis Rey WWTP and delivered to Whelan Lake and one irrigation customer. Historical water supplies are provided in **Table 6-2**.

Table 6-2: Historical Water Supplies (in FY)

Supply Source	Supply (acre feet)						Average Supply (AFY)	Percentage of Supply (%)
	2010	2011	2012	2013	2014	2015		
Purchased from SDCWA[1]	24,897	21,559	23,773	24,139	24,540	20,400	23,218	85%
Groundwater[2]	3,732	4,522	3,371	4,575	4,735	3,213	3,883	14%
Recycled Water[3]	119	110	125	128	140	104	121	0.4%
Total	**28,748**	**26,191**	**27,269**	**28,842**	**29,637**	**23,717**	**27,222**	**100%**

1 Includes treated and untreated water purchased from SDCWA. Includes SDCWA water treated and served to VID customers in the Fall/Olive Exchange.
2 Groundwater treated at the Mission Basin Groundwater Purification Facility.
3 Recycled water produced at San Luis Rey WWTP.

As shown in **Table 6-2**, approximately 85% of the City's water supply for the period 2010 through 2015 came from water purchased from SDCWA. This period is indicative of historical water supply for the City. In the future, the City plans to use more water from local sources, thereby lessening the need for imported water. Current water supplies utilized in 2015 are shown in **Table 6-3**.

Table 6-3: Water Supplies – 2015 Actual

DWR Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield (optional)
Purchased or Imported Water	Blend of imported water and desalinated seawater purchased from SDCWA	20,400	Raw and Treated	--
Groundwater	Desalted groundwater from MBGPF	3,213	Raw Water	--
Recycled Water	Recycled Water produced at San Luis Rey WWTP	104	Recycled water	--
	Total	**23,717**		
NOTES: Includes SDCWA water treated and served to VID customers in the Fall/Olive Exchange				

Future potable water supplies include the SDCWA supplies, expanded extraction and treatment of water from the Mission Basin, and advanced treated water (indirect potable reuse). The City has completed construction of additional facilities to produce up to 7,130 acre-ft per year of treated water at the MBGPF. Operation of the MBGPF began in 1992, with an expansion completed in 2002, and a granular activated carbon process added in 2009.

SDCWA supplies both treated and untreated water to the City through five aqueduct connections. Treated water is conveyed directly to the City's water distribution system, while untreated water is first conveyed to the City's Robert A. Weese Water Filtration Plant (Weese WFP), in Vista California. The Weese WFP is owned and operated by the City and was originally designed and constructed in 1983 with a capacity of 16.5 MGD. As reported in the City's *2015 Water Master Plan*, the annual water supply for the City in 2012 comprised an average day demand (ADD) of 24.9 MGD (City of Oceanside 2015a).

The City is planning the expansion of its recycled water system through both additional non-potable recycled water deliveries and an indirect potable reuse (IPR) project to increase water supply reliability. The IPR project would produce advanced treated water that would eventually be used to meet potable demands. The City's goal is to have this IPR project produce approximately 3.0 MGD of the City's potable water supply, which would reduce the reliance on imported water. Advanced treated water would be injected into the Mission Basin for groundwater recharge. Extracted water would be treated at MBGPF, and then pumped into the distribution system.

Future construction of a seawater desalination facility is being considered by the City, but is currently in the feasibility phase. A 2010 *Seawater Desalination Pilot Facility and Feasibility Study* placed monitoring and test wells at a site near the Oceanside Harbor and utilized a reverse osmosis treatment system. This study was designed to develop design parameters for a treatment process supporting implementation of a full-scale seawater desalination project at the MBGPF. Water would be extracted from the ocean by a series of 10 to 20 wells in the Mission Narrows area, near the mouth of the San Luis Rey River, and blended with brackish groundwater from the Mission Basin prior to treatment. This blend would result in a lower salinity source and allow for greater recovery of potable water by reducing the energy demands for treatment. The City is continuing to explore this supply option, but due to the preliminary nature, this supply is not included in the City's projections. Planned water supplies are incorporated into the City's water supply projections. Projected water supplies are provided in **Table 6-4**. The planned water supplies are based on meeting the 2020 GPCD target for potable water.

Table 6-4: Water Supplies - Projected

DWR Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2020		2025		2030		2035		2040	
		Reason-ably Avail. Volume	Total Right or Safe Yield *(opt.)*	Reason-ably Avail. Volume	Total Right or Safe Yield *(opt.)*	Reason-ably Avail. Volume	Total Right or Safe Yield *(opt.)*	Reason-ably Avail. Volume	Total Right or Safe Yield *(opt.)*	Reason-ably Avail. Volume	Total Right or Safe Yield *(opt.)*
Purchased or Imported Water	From SDCWA	24,728	--	24,215	--	22,913	--	23,130	--	23,037	--
Groundwater	Mission Basin	3,300	10,000	3,700	10,000	3,700	10,000	3,700	10,000	3,700	10,000
Recycled Water	Non-potable	400	--	1,700	--	2,900	--	3,060	--	3,500	--
Other	Advanced treated water (IPR)	3,300	--	3,300	--	3,300	--	3,300	--	3,300	--
Total		**31,728**		**32,915**		**32,813**		**33,190**		**33,537**	
NOTES: Assumes purchased water make up and demands not fulfilled by local supplies. Advanced treated water is IPR that is injected into the Mission Basin and extracted for potable use.											

6.2 Purchased Water

MWD is Southern California's wholesale water agency, and SDCWA is the largest customer among MWD's 26 member agencies. MWD derives its water supply from the Colorado River (via the Colorado River Aqueduct) and the SWP (via the California Aqueduct). In 1998, SDCWA entered into a transfer agreement with IID to purchase conserved agricultural water. Through the agreement, SDCWA received 70,000 acre-feet (AF) in 2010 and will receive an annually-increasing volume up to 200,000 AF by 2021 for 75 years. Through the 2003 Quantification Settlement Agreement (QSA) on the Colorado River, SDCWA also receives 77,700 AF per year of conserved water from lining of the All-American and Coachella Canals for 110 years (RWMG, 2013).

SDCWA supplies a blend of imported water and desalinated seawater to member agencies within San Diego County. SDCWA's imported water includes SWP supplies from MWD and Colorado River supplies acquired through other means. SDCWA receives Colorado River supplies via transfers from IID and conservation savings from several canal-lining projects. In October 2015, SDCWA began purchasing and treating desalinated seawater from the Carlsbad Desalination Plant, which is operated by Poseidon Resources Group. This desalinated seawater is blended into SDCWA's treated water supply and delivered to SDCWA's member agencies. Additional information regarding SDCWA's historical, current, and planned supplies is available in SDCWA's 2015 Urban Water Management Plan.

SDCWA supplies both treated and raw imported water to the City through five aqueduct connections. Treated water is delivered directly into the City's distribution system. Raw water is treated at the City's Weese WFP prior to delivery into the City's distribution system. Of the SDCWA water supply, approximately 31% is purchased treated water and 69% is purchased untreated water that is then treated at the City's Weese WFP.

SDCWA provided the City with its Draft Member Agency Demand Forecast for City of Oceanside in March 2016. **Table 4-9** (above) shows the amount of water the City anticipates purchasing from SDCWA in five-year increments until 2040

6.3 Groundwater

CWC §10631(b)(1), §10631(b)(2), §10631(b)(3), §10631(b)(4)

The City utilizes groundwater from the Mission Basin subbasin of the San Luis Rey Valley Groundwater Basin. An overview of the Mission Basin, along with a summary of the City's associated facilities and use, is provided here. The Mission Basin is shown on **Figure 6-2**, above.

6.3.1 Mission Basin

The Mission Basin is currently designated as a subbasin to the San Luis Rey Valley Groundwater Basin (DWR Bulletin 118 Groundwater Basin No. 9-7). The San Luis Rey Valley Groundwater Basin has been designated a medium priority basin under the California Statewide Groundwater Elevation Monitoring (CASGEM) program, meaning that the state considers it a priority basin for monitoring. The City has volunteered as a monitoring entity for the basin, in conjunction with the County of San Diego.

The Mission Basin is an alluvial basin extending from the Pacific Ocean in the west to just beyond the City's eastern border. The basin is not adjudicated but is estimated to have a natural safe yield of 7,000 to 10,000 AFY. Due to high levels of TDS, ranging between 500 mg/L and 2,000 mg/L, desalting is

required prior to distribution and use (MWD, 2007). Trichloropropane (TCP), iron and manganese levels are also of concern in the Mission Basin, but are treated to safe levels at the MBGPF (City of Oceanside, 2015a). No groundwater management plan is currently in place for the Mission Basin, but the City is exploring formation as the Groundwater Sustainability Agency (GSA) for the lower basin, along with designation as a formally-recognized basin separate from San Luis Rey Valley Groundwater Basin.

The City has conducted studies to determine the impact of groundwater pumping on local groundwater levels (Welch, 1996). Those studies concluded that the planned expansion of the MBGPF will result in no significant impacts to existing groundwater-dependent vegetation during extended dry-year periods lasting up to three years. With the addition of the IPR project, advanced treated water would recharged into the groundwater basin regardless of hydrologic conditions. Therefore, the MBGPF is considered a reliable source of up to 7,130 AFY of potable water during multiple-dry water years.

6.3.2 Mission Basin Groundwater Purification Facility

MBGPF is a desalting treatment facility that treats brackish groundwater extracted from the Mission Basin via eight wells including four "on-site" wells located at the MBGPF site and four "off-site" wells, located in the eastern portion of the basin near North River Road west of College Blvd. The MBGPF was put into service in 1992 with a capacity of 2.0 MGD, and expanded to its current capacity of 6.37 MGD, or 7,130 acre-feet per year, in 2002.

The primary MBGPF treatment process utilizes reverse osmosis membranes to reduce salt concentrations present in the groundwater. A secondary treatment process, added in 2009, utilizes granular activated carbon to remove 1, 2, 3-trichloropropane (TCP) from six of the wells. A side-stream treatment system is employed to reduce iron and manganese. The reverse osmosis membranes are Hydranautics Model ESPA1 that operate at a feed pressure of approximately 150 psi. The facility is capable of removing many impurities from the groundwater including particles, iron, manganese, TCP, and sodium to meet drinking water standards. Iron and manganese are present in the on-site wells, and manganese is present in the off-site wells.

After the minerals and other impurities are removed through reverse osmosis, the product is then blended with a 20% share of water direct from the well field and subjected to additional post-blend treatment to result in a finished, potable water supply. **Table 6-5** shows the amount of groundwater pumped for the past 5 years. During this period, the City experienced some challenges in groundwater extraction, including mechanical limitations and well production. The City is continuing to make improvements to reduce these challenges, but have determined that the reliable average brackish groundwater supply is 3,300 AFY. The addition of IPR will allow for increased extraction of groundwater and help to consistently maximize the use of existing groundwater pumping and treatment facilities. As previously noted, the City anticipates expanding groundwater extraction and use to offset demands for purchased SDCWA water. Projected groundwater supplies are presented in **Table 6-4**, above.

Table 6-5: Groundwater Volume Pumped (AFY)

DWR Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Mission Basin	4,522	3,371	4,575	4,735	3,213
	TOTAL	**4,522**	**3,371**	**4,575**	**4,735**	**3,213**

6.4 Surface Water

The City does not use or plan to use self-supplied surface water as part of its water supply.

6.5 Storm Water

The City does not currently divert storm water for beneficial reuse and has no plans to do so as of the development of this plan.

6.6 Transfer Opportunities

CWC §10631(d)

The City has multiple connections to an intricate outside network of water distribution systems through SDCWA and neighboring urban water suppliers that can be utilized in an emergency. Aside from the small volume of water that the City provides to VID customers through the Fall/Olive Exchange, the City does not regularly sell or transfer water to other agencies. The City currently has nine emergency interconnections with four neighboring agencies that can be used to share supplies during short-term emergencies or planned shutdowns. The City has three emergency interconnections with Rainbow Municipal Water District (RMWD), two with Carlsbad Municipal Water District (CMWD), three with VID, and one with USMC Camp Pendleton. These connections are considered short-term exchanges for emergencies and are described in **Table 6-6** below.

Table 6-6: Transfer and Exchange Opportunities

Neighboring Agency	Location	Size/ Capacity (cfs)	Direction
VID	Rose and Granada	8	City
VID	Fall Place	8	City
VID	E. Vista Way and Osborne	14	City and VID
RMWD	Camino Corto	6	City
RMWD	Weese WFP	8	RMWD
CMWD	Vista Way and El Camino Real	16	Carlsbad
CMWD	College South of Esplanade	8	Carlsbad
USMC Camp Pendleton	Morro Hills Reservoir	12	Camp Pendleton
Source: City of Oceanside, 2015a			

6.7 Desalinated Water Opportunities

CWC §10631(i)

The City has planned for desalinated water as an expected future water supply to become less dependent upon imported water and to diversify its water resources. Overall, the increase in demand over the next 25 years is significant, making the opportunity to use desalinated water even more important in the City's plan to rely less on imported water and to expand its own water resources. There are two types of desalinated water available or potentially available to the City: desalinated groundwater and desalinated seawater. Desalinated groundwater is discussed in *Section 6.3 Groundwater* above. When desalinated seawater is included in SDCWA's blended supply, there is potential for the City to receive some desalinated seawater through its purchases of treated water from SDCWA. SDCWA's blended treated supplies began to include desalinated seawater from the newly constructed Carlsbad Desalination Plant at the end of 2015. These blended desalinated seawater supplies acquired through regular purchases from SDCWA are considered part of the City's SDCWA supplies.

In addition to the desalinated seawater the City receives as part of its SDCWA purchases, the City is exploring the potential for an independent supply of desalinated seawater. The City completed a *Seawater Desalination Pilot Facility and Feasibility Study* in October 2010. The main objective of this study was to identify a feasible, constructible and cost effective project to add a seawater component to the MBGPF. As per the study, the source of the seawater would be a series of extraction wells near the mouth of the San Luis Rey River. The design of the wells would prevent drawdown of the Mission Basin and the drawdown of potential effects on the other City wells and the habitat mitigation areas. The planning would also need to consider the operation of the seawater barriers if the recharge and extraction project were to be implemented.

The seawater would be pumped from the wells back to the MBGPF, where a seawater reverse osmosis plant would be co-located. There is sufficient City-owned land to accommodate this addition, and the treated water would be introduced into the distribution system. The brine and brine disposal limitations would be similar to the groundwater storage and retrieval project described previously.

Combining existing MBGPF brackish water treatment with a nearby seawater component could potentially reduce costs for the City by co-locating facilities and reducing dependence on purchased water. This approach also maximizes the use of Mission Basin supplies and could result in a raw water salt content that is significantly lower than direct seawater, which can reduce energy costs substantially. The City's *2015 Water Master Plan* assumed implementation of a 5.0 MGD desalination plant with a net production of 4.5 MGD, or 5,040 AFY, in the long-term planning period. However, due to uncertainty regarding the feasibility of this project, the City has elected to exclude this potential seawater desalination supply from its supply projections.

6.8 Wastewater and Recycled Water

CWC §10633(a-g)

6.8.1 Wastewater Collection and Treatment Facilities

The City's wastewater collection and treatment system is composed of two major systems: the San Luis Rey WWTP and the La Salina WWTP along with their collection systems. The San Luis Rey WWTP collects wastewater from the central and eastern portions of the City, as well as the City of Vista and Rainbow Municipal Water District (RMWD). The La Salina WWTP has historically collected wastewater from the western portion of the City; however, the City is currently in the process of

decommissioning the La Salina WWTP. Effluent from both plants is discharged to the ocean through the Oceanside Ocean Outfall. The Morro Hills area in the northern part of the City uses septic systems and is not currently connected to any of the City's wastewater facilities. The San Luis Rey WWTP can treat up to 0.7 MGD of wastewater to recycled water standards, while the La Salina WWTP has no tertiary treatment. California Department of Transportation (Caltrans) and one private customer located within the City also receives some recycled water from the Fallbrook Public Utility District (FPUD).

San Luis Rey WWTP

The City of Oceanside has produced recycled water for many years, starting with the construction of the San Luis Rey WWTP in 1972. Secondary effluent was supplied to Whelan Lake for storage, though the lake has since then changed its uses and is presently a bird sanctuary. The City has an existing recycled water system consisting of 1.2 miles of recycled water pipeline that serves one customer, the Oceanside Municipal Golf Course. The golf course received 104 AFY tertiary recycled water in 2015. Tertiary recycled water not delivered to the golf course is discharged into Whelan Lake, which received an estimated 160 AF in 2015. Tertiary recycled water is produced for approximately seven months of the year. Deliveries to Whelan Lake are not included in the City's recycled water use data because it acts primarily as a form of disposal rather than a customer. Further, deliveries to Whelan Lake are made through an unmonitored meter. Between 2011 and 2015, annual deliveries to Whelan Lake averaged an estimated 194 AF, or approximately 60% of the City's total recycled water production. Recycled water use in 2015 was lower than historical use as a result of overall water use reduction measures. Although recycled water use was exempt from mandatory restrictions, some changes implemented depressed demand (e.g., conversion to water wise landscaping), as well as behavioral changes in response to public perception.

The San Luis Rey WWTP provides secondary treatment for most of the City service area, as well as RMWD and a portion of the City of Vista. The San Luis Rey WWTP has a peak-month capacity of 15.4 MGD. The 2013 average annual secondary effluent flow was 9.7 MGD and average annual tertiary effluent flow was 0.35 MGD. By agreement, the plant also provides treatment for up to 1.5 MGD of wastewater from the RMWD.

Installation of recycled water pipelines constructed as part of the Recycled Water Conversion and Pipelines Project

The treatment processes at the San Luis Rey WWTP include preliminary, primary, and activated sludge secondary treatment. The biosolids are anaerobically digested and dewatered by centrifuges prior to land application. The majority of secondary effluent is sent to the Oceanside Ocean Outfall via the La Salina WWTP.

In 1991, a tertiary filter and chlorine contact basin was constructed. Currently, up to 0.7 MGD of the secondary effluent can be treated further to meet Title 22 requirements for unrestricted reuse. The

effluent is disinfected in a chlorine contact channel and then stored in a 2.2 million gallon, lined storage pond located at the southerly portion of the San Luis Rey WWTP. The recycled water is then pumped to the Oceanside Municipal Golf Course or to replenish Whelan Lake. The City plans to expand tertiary treatment capacity at the San Luis Rey WWTP to 1.5 MGD by 2017 and 7.5 MGD by 2045. Secondary treatment capacity will be also increase from 13.5 MGD in 2020 to 17.4 MGD in 2045. The *2015 Recycled Water Facilities Plan* included expansion of both an upper and lower distribution system within the City (see discussion below).

La Salina Wastewater Treatment Plant

The La Salina WWTP has a rated secondary treatment capacity of 5.5 MGD. The treatment processes include preliminary, primary, and activated sludge secondary treatment. The biosolids are anaerobically digested, dewatered by belt filter presses, and land applied off-site. There are no recycled water treatment facilities at the La Salina WWTP.

In 2014, the City completed an alternatives analysis for rehabilitating the La Salina WWTP but decided to move forward with the option to convert the plant to a pump station to convey wastewater flows to San Luis Rey WWTP for treatment. Therefore, all projected wastewater flows to La Salina WWTP will augment flows at San Luis Rey WWTP.

Fallbrook Public Utility (FPUD) District Treatment Plant

FPUD currently owns and operates one treatment (Plant No. 1) with a design capacity of 2.7 MGD. Previously FPUD has an additional plant (Plant No. 2) which has since been abandoned. Tertiary recycled water that is not used by FPUD is disposed in the Fallbrook Land Outfall, which runs through the City of Oceanside. By agreement with the City of Oceanside, FPUD can discharge up to 2.4 MGD on an annual average basis through the Oceanside Ocean Outfall.

Historically, recycled water from FPUD was used to irrigate the Arrowood Country Club in the City's service area. This connection still exists, although in recent years the Arrowood Country Club has used water from private wells located on its property. A 1986 agreement between FPUD and Caltrans allows Caltrans to divert up to 2 MGD of recycled water from the Fallbrook Land Outfall for irrigation purposes.

FPUD is planning to upgrade their treatment plant to produce advanced treated recycled water and use the Fallbrook Land Outfall for brine discharge. Based on the City Council's decision in November 2014, the Fallbrook Land Outfall will be used to convey raw wastewater to the San Luis Rey WWTP in the near-term. As a result, recycled water that currently serves Caltrans through FPUD will not be available in future projections. The City anticipates serving tertiary recycled water to Caltrans as part of its recycled water system expansion.

Camp Pendleton South Regional Tertiary Treatment Plant

North of the City, the U.S. Marine Corps, Camp Pendleton owns and operates the South Regional Tertiary Treatment Plant (SRTTP) which began operation in August 2006. The SRTTP has a tertiary design capacity of 5.0 MGD and currently treats an annual average flow of about 2.4 MGD. The recycled water produced is supplied through a recycled water distribution system to irrigate four sites in the southern part of the Camp Pendleton Base. Currently, the SRTTP treats all wastewater to tertiary levels, and excess tertiary treated effluent that is not recycled is discharged to the Pacific Ocean via the Camp Pendleton Land Outfall and the City of Oceanside's Ocean Outfall.

Table 6-7 shows the volume of wastewater collected in the City's service area in 2015 from the San Luis Rey WWTP and La Salina WWTP. **Table 6-8** summarizes the wastewater treatment and disposal within the City's service area.

Table 6-7: Wastewater Generated Within Service Area in 2015

DWR Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
Percentage of 2015 service area covered by wastewater collection system *(optional)*						--
Percentage of 2015 service area population covered by wastewater collection system *(optional)*						--
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015 (AF)	**Receiving Wastewater Treatment**			
			Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Oceanside	Metered	9,750	City of Oceanside	San Luis Rey WWTP	Yes	No
City of Oceanside	Metered	3,225	City of Oceanside	La Salina WWTP	Yes	No
USMC Camp Pendleton	Metered	2,216	USMC Camp Pendleton	SRTTP	No	Yes
Total Wastewater Collected from Service Area in 2015:		15,191				
NOTES: Volumes were monitored in million gallons and converted into acre-feet for purposes of this 2015 Plan.						

Table 6-8: Wastewater Treatment and Discharge within Service Area in 2015

DWR Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
San Luis Rey WWTP	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	Yes	Secondary, disinfected	9,751	3,224	--	--
San Luis Rey WWTP	City of Oceanside	Recycled Water Customers		Other	Yes	Tertiary	--	--	264	--
La Salina WWTP	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	No	Secondary, undisinfected	9,427	2,845	--	--
FPUD Plant No.1	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	Yes	Tertiary	1,588	1,004	--	584
Camp Pendleton SRTTP	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	Yes	Tertiary	2,216	--	--	--
						Total	**22,982**	**7,073**	**264**	**584**
NOTES: Within the City's service area, FPUD Plant No. 1 only provides recycled water to Caltrans.										

6.8.2 Potential and Projected Recycled Water Use

As noted previously, the City is actively pursuing substantial expansion of its recycled water system. As a member of the North San Diego Water Reuse Coalition (NSDWRC), the City is coordinating with nine other water and wastewater agencies in northern San Diego County to maximize recycled water use and improve recycled water efficiencies. Many of the planned recycled water projects and uses discussed here are also part of the NSDWRC's efforts. Additional information on the NSDWRC is provided below.

Non-Potable Recycled Water

In 2015, the City completed its *Recycled Water Facilities Plan* (RWFP). The RWFP updates projected demands, needed treatment and distribution facilities, and estimated cost of water. Potential uses of recycled water include agricultural irrigation, landscape irrigation, wildlife habitat enhancement at Whelan Lake, and groundwater recharge. The primary use for recycled water will be for landscape irrigation, which includes golf courses (Oceanside Municipal Golf Course, Arrowood Golf Course, Ocean Hills Country Club, Goat Hill Golf Course), cemeteries, parks (El Corazon Site), and home owner associations.

As recommended in the City's RWFP, two proposed recycled water systems were developed:

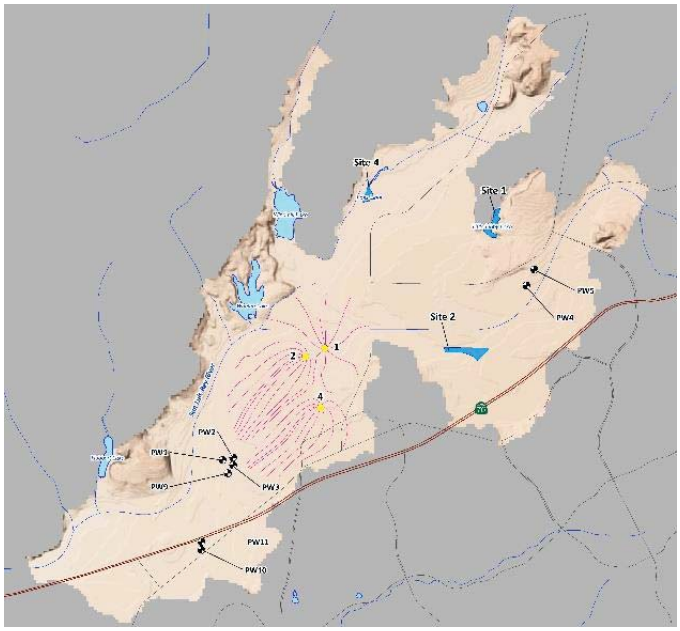
1. The Upper SLRWRF system includes service to Arrowood Golf Course, Gilligan Groves, Rocket Farms Herbs and other agriculture and irrigation customers. The Upper SLRWRF would serve 1,110 AFY of recycled water over the next 15 years (2015 – 2030) and includes expansion of the SLRWRF tertiary treatment plant from 0.7 MGD to 2.5 MGD and approximately 12 miles of new 6- to 20-inch diameter pipeline. The Upper SLRWRF system would be implemented in three phases:
    - Phase 1 would consist of the tertiary treatment expansion, operational storage and a tertiary pump station at the SLRWRF.
    - Phase 2 would consist of pipelines from the SLR WRF to the most northern area, and also to the western area to connect the inactive recycled water pipelines already in place. Two booster pump stations are needed along the distribution system to serve the northeast area. A storage tank (1 MG) would also be implemented in this phase.
    - Phase 3 would replace the recycled water supply from Camp Pendleton's SRTTP and would consist of connecting to the existing recycled water pipelines near Arrowood Golf Course. An additional pump station would be needed at SLRWRF to serve Arrowood Golf Course.
2. The Lower SLRWRF System includes service to El Corazon Site, El Camino Country Club Golf, Ocean Ranch Future Development, Ocean Hills Area and other landscape irrigation customers. The Lower SLRWRF System would serve 2,040 AFY of recycled water over the next 25 years (2015 – 2040) and includes an additional expansion of the SLRWRF tertiary treatment by 3.75 MGD and approximately 23 miles of 6- to 20-inch diameter pipeline. The Lower SLRWRF system would be implemented in five phases:
    - Phase 1 would consist of supplying recycled water to Goat Hill Golf Course. The SLRWRF would be expanded by an additional 0.8 MGD and a 1.5 MG operation tank will be constructed at the El Corazon site. This phase includes two recently completed pipeline alignments the City constructed from the 10-inch diameter brine pipeline and modification

to an existing pump station at the San Luis Rey WWTP to deliver recycled water to the El Corazon Recycled Water Tank and the Goat Hill Golf Course.

- Phase 2 would consist of serving customers in the Ocean Hills Area, the El Camino Country Golf Club, the El Corazon Site, and Eternal Hills Cemetery. This phase would consist of two pump stations at the El Corazon Recycled Water Tank and a booster pump station near Vista Way and College Boulevard.
- Phase 3 would consist of a new 16-inch diameter pipeline (22,700 linear feet) from SLRWRF to the proposed El Corazon Recycled Water Tank, which includes a river crossing, a highway crossing, and a tunnel near the intersection of Ocean Boulevard and Mesa Drive. Approximately 8,000 linear feet of 16-inch diameter pipeline east of the El Corazon Recycled Water Tank would also be implemented to serve the future development in the area of Ocean Ranch. This phase includes a storage tank, a pump station at the San Luis Rey WWTP, and two pump stations at the El Corazon Recycled Water Tank.
- Phase 4 would extend the eastern alignment south to serve Mira Costa College and would consist of 11,280 linear feet of 8-inch diameter pipeline. This phase includes a storage tank, treatment expansion at SLRWRF, an additional pump at the San Luis Rey WWTP and an additional pump at El Corazon Recycled Water Tank.
- Phase 5 would extend the eastern alignment to the north area and would consists of 20,110 linear feet of 6- to 16 inch diameter pipeline to serve recycled water to Villages of Rancho Del Oro and other customers in the this area. This phase includes a storage tank, additional pumps at the San Luis Rey WWTP and El Corazon Recycled Water Tank, and a new booster pump station near Avenida Del Oro and Avenida De La Plata.

Indirect Potable Reuse

The City is also planning to expand its recycled water program through the implementation of an IPR project. If IPR is implemented, advanced treated water would be stored in the Mission Basin for groundwater recharge through the use of a combination of injection and extraction. The recharged recycled water would help replenish the local groundwater basin, which would later be extracted for potable water usage. The MBGPF would be utilized to treat the additional supply, which would be pumped into the distribution system of the Guajome pressure zone. It is anticipated that the IPR project will provide approximately 3,360 AFY of additional supply by 2020 and 5,000 AFY of additional supply by 2050.



Indirect Potable Reuse (IPR) modeling showing residence time of recycled water in the Mission Basin

North San Diego Water Reuse Coalition

The City is currently a member of the North San Diego Water Reuse Coalition (NSDWRC), a coalition of ten (10) water and wastewater agencies, developing a Regional Recycled Water Feasibility Study which will be utilized by the Coalition to pursue Title XVI funding from the US Bureau of Reclamation and Proposition 1 Funding from the State of California, as well as other state or local grant funds. Both the non-potable and potable reuse program components are included in the Coalition study.

Table 6-9 presents the current and projected recycled water use in the City through 2040. Projected recycled water supply will serve landscape irrigation demands for customers in the municipal, commercial, and government sectors, as well as potable demands through the City's planned IPR project.

Table 6-9: Current and Projected Recycled Water Use

DWR Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area									
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:			City of Oceanside						
Name of Agency Operating the Recycled Water Distribution System:			City of Oceanside						
Supplemental Water Added in 2015			Not Applicable						
Source of 2015 Supplemental Water			Not Applicable						
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040	
Agricultural irrigation									
Landscape irrigation (exc. golf courses)	Municipal, commercial, and government sectors.	Tertiary	104	400	1,700	2,900	3,060	3,500	
Golf course irrigation									
Commercial use									
Industrial use									
Geothermal and other energy production									
Seawater intrusion barrier									
Recreational impoundment									
Wetlands or wildlife habitat									
Groundwater recharge (IPR)									
Surface water augmentation (IPR)									
Direct potable reuse									
Other *Type of Use*									
		Total:	104	400	1,700	2,900	3,060	3,500	

NOTES: IPR - Indirect Potable Reuse. The City of Oceanside is pursuing IPR via injection of advanced treated water into the Mission Basin, and extracting it for potable use. This advanced treated water is not reported in this table for consistency between auto-calculated supplies and demands in the DWR tables and actual projected supplies and demands. This avoid the appearance of double-counting IPR as both a recycled water demand and a potable demand, and provides clarity for the reader when reviewing these detailed tables against the summary tables also provided in the text. Advanced Treated Water (IPR) will be used in the following volumes for each identified year: 2020 - 3,300 AF, 2025 - 3,300 AF, 2030 - 3,300 AF, 2035 - 3,300 AF, 2040 - 3,300 AF.

As compared to the projections for 2015 from the 2010 Plan, actual 2015 recycled water use was low. Expansion of the City's non-potable system was delayed during the planning and design phases, including conversion of an existing brine line into a dedicated recycled water transmission line and completion of environmental compliance. **Table 6-10** shows the 2010 projection along with the actual 2015 recycled water use.

Table 6-10: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual Use

DWR Table 6-5 Retail: 2010 UWMP Use Projection Compared to 2015 Actual		
Use type	**2010 Projection for 2015**	**2015 actual use**
Sales to Other Agencies	-	-
Agricultural irrigation	-	-
Landscape irrigation (ex golf courses)	933	104
Golf course irrigation	-	-
Commercial use	-	-
Industrial use	-	-
Geothermal and other energy production	-	-
Seawater intrusion barrier	-	-
Recreational impoundment	-	-
Wetlands or wildlife habitat	-	-
Groundwater recharge (IPR)	-	-
Other	-	-
Total	**933**	**104**

6.8.3 Methods to Encourage Recycled Water Use

Although recycled water is currently only available to the Oceanside Golf Course and Whelan Lake for habitat purposes, the City does offer financial incentives that will encourage recycled water use when it is made available to future customers. The City currently offers a discounted price for recycled water ranging between approximately 16% and 19% below the cost of potable water. In addition, Section 37.144 of the City's municipal code includes a mandatory use ordinance that states "If recycled water service is determined by the administrative authority to be feasible, applicants for new water service shall be required to install onsite facilities to accommodate both potable water and recycled water service in accordance with the latest Water, Sewer, and Reclaimed Water Design and Construction Manual. The administrative authority may also require existing customers to retrofit existing onsite water service facilities to accommodate recycled water service." With the expansion of the City's recycled water distribution system and increased recycled water production, recycled water delivery will become more feasible. In concert with this mandatory use requirement and the expansion of the recycled water system, the City anticipates a substantial increase in recycled water use. **Table 6-11** shows the City's planned methods to expand future recycled water use.

Table 6-11: Methods to Expand Future Recycled Water Use

DWR Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Actions	**Description**	**Planned Implementation Year**	**Expected Increase in Recycled Water Use**
Upper SLRWRF System – Phase 1	Tertiary treatment expansion, operational storage and pump station	2020	-
Upper SLRWRF System – Phase 2	Pipelines, two booster pump stations, storage tank	2025	720
Upper SLRWRF System – Phase 3	Pipelines and pump station	2030	390
Lower SLRWRF System – Phase 1	Tertiary treatment expansion, pipelines, and pump station	2020	60
Lower SLRWRF System – Phase 2	Pipelines, operational storage and pump station	2025	590
Lower SLRWRF System – Phase 3	Tertiary treatment expansion, pipelines, operational storage and pump station	2030	800
Lower SLRWRF System – Phase 4	Tertiary treatment expansion, pipelines, operational storage and pump station	2035	170
Lower SLRWRF System – Phase 5	Pipelines, operational storage and pump station	2040	420
Mandatory Use Ordinance	Municipal Code Sec. 37.144	2014	-
		Total	**3,150**

6.9 Future Water Projects

CWC §10631 (g)

This section includes planned and alternative water projects to supply the City in the future.

6.9.1 Mission Basin Groundwater Purification Facility

The MBGPF is a very cost-effective source of water. However, limited well capacity and TCP contamination has limited the output to about 4.1 MGD. When capacity is reached, the average cost per acre-foot of operations and maintenance to treat the water will drop even further. The City is taking steps to increase the groundwater capacity to match the existing treatment capacity of 6.4 MGD, which is aligned with the safe yield of the Mission Basin. The 6.4 MGD matches the capacity of the Mission Basin without other sources of groundwater augmentation, which is discussed as an alternative later in this section. The design of new wells and pipelines to the MBGPF is underway.

6.9.2 Local Seawater Desalination Facility

In October 2010, the City completed a feasibility study that examined the potential to add seawater desalination to the existing MBGPF in order to meet future water supply demands. The source of the seawater would be a series of extraction wells near the mouth of the San Luis Rey River. The operation of seawater barriers will also be considered for the recharge and extraction project. The seawater

reverse osmosis plant would be constructed at the MBGPF where treated water would be introduced into the distribution system.

Combining existing MBGPF brackish water treatment with a nearby seawater component could potentially reduce costs for the City. This approach also maximizes the use of San Luis Rey supplies and could result in a salt content that is significantly lower that direct seawater. Lower salt content can significantly reduce energy costs. Additional feasibility studies are currently underway to determine the potential for local seawater desalination. These studies expand on the work completed in 2010.

6.9.3 Wastewater Recycling

The 2015 RWFP investigated the feasibility of developing an extensive recycled water distribution system for the SLRWRP to identified markets within the City limits.

- The Upper SLRWRF System would be implemented in three phases and would have a total capital cost of $42.7 million. The Upper SLRWRF System would serve 62 customers and offset an additional 1,110 AFY of potable water on top of existing production.
- The Lower SLRWRF System would be implemented in five phases and would have a total cost of $84.1 million. The Lower SLRWRF System would serve 83 customers and offset 2,040 AFY of potable water.

The City plans to pursue additional direct reuse opportunities for treated effluent in the future, as funding becomes available. The San Luis Rey WWTP expansion included space for increased tertiary treatment capacity of 7.5 MGD for direct reuse. The City will require dual distribution facilities to be built in new developments where recycled water is planned for use.

The City is also actively pursuing the expansion of its recycled water program through an IPR project to increase water supply reliability. The City's goal is to have this IPR project produce approximately 3.0 MGD of the City's potable water supply, which would reduce the reliance on imported water. The actual capacity, size, and location of the future IPR facilities, as well as feasibility level cost estimates, are currently being developed by the City.

Table 6-12 lists the future water projects that would increase the City's water supply.

Table 6-12: Future Water Supply Projects

DWR Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. LOCATION OF THE NARRATIVE_____					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
	Y/N	If Yes, Agency Name				
Groundwater Desalination	N	--	--	2020	All	1,200
Seawater Desalination[1]	N	--	--	2025	All	5,040
Non-potable Recycled Water Expansion	N	--	--	2015-2040	All	3,150
Potable Reuse	N	--	--	2020-2040	All	3,360-5,000
NOTES: 1. Seawater Desalination is still undergoing feasibility studies and is not included in projected supplies. It is included here to show the potential supply increase that may be realized should the project move forward in the future.						

6.10 Climate Change Impacts to Supply

As described in *Section 3 System Description*, the City faces some vulnerabilities to its supplies, especially as relates to their reliance on imported supplies. The City's supplies are vulnerable to a decrease in imported supply, sensitivity related to higher drought potential, a potential decrease in groundwater supplies coupled with limited groundwater storage. It is also vulnerable to the impacts of invasive species that could reduce available supplies, particularly if this impact reduces subsurface flows into the Mission Basin. Because the City's imported supplies (received as part of purchased supply mix from SDCWA) are dependent on snowmelt, and the City currently purchases approximately 85% of its supply from SDCWA, climate change impacts to snowpack and timing of snowmelt can negatively impact available imported supplies. Although the San Diego region expressed some concern that seawater intrusion could make limited groundwater basins less available, the City already uses a brackish basin for supply, and is capable of continuing to treat brackish groundwater at the MBGPF even if seawater intrusion occurs.

The current drought has shown that the City is able to implement temporary use reduction measures to address supply limitations of drought, but some of these efforts are only designed to be temporary, and are not a long-term solution to climate change impacts to supply availability. As described in this section, the City is working to reduce reliance on purchased SDCWA water, while SDCWA is also seeking to reducing dependence on imported water from MWD.

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SECTION 7: SUPPLY RELIABILITY ASSESSMENT

This section describes the overall reliability of the City's water supplies, including water quality characteristics and contingency planning under drought conditions.

7.1 Constraints on Water Sources

CWC 10631, CWC 10634

Two major constraints on water sources have potential to affect water supply reliability for the City: service reliability and water quality. This section discusses the reliability of the City's water supplies with respect to water quality and service reliability.

7.1.1 Service Reliability

The costs of demand management or supply augmentation to reduce the frequency and severity of shortages are now high enough that the City must look more carefully at the costs of unreliability to make the best possible estimate of the net benefit of taking specific actions, hence the term "reliability planning." Reliability is a measure of a water service system's expected success in managing water shortages. To plan for long-term water supply reliability, planners examine an increasingly wide array of supply augmentation and demand reduction options to determine the best courses of action for meeting water service needs. Such options are generally evaluated using the water service reliability planning approach.

Service reliability can be effected by climate (e.g., drought, snowmelt, and other factors), environmental (e.g., minimum flow requirements for habitat), and other factors such as cost (e.g., cost to buy or produce water, cost to expand systems to deliver water). Other factors that can cause water supply shortages are earthquakes, chemical spills, and energy outages at treatment and pumping facilities. City planners include the probability of catastrophic outages when using the reliability planning approach. **Table 7-1** shows the different factors that may result in inconsistency of supply.

Table 7-1: Factors Resulting in Inconsistency in Supply

Name of Supply (Treatment Plant)	Political/ Legal	Environmental	Water Quality	Climatic
SDCWA water supply (Weese WFP)	Increased cost of water	Pumping restrictions on SWP; Earthquake and aqueduct breakage		Reduced natural streamflow and/or snowpack
Groundwater (MBGPF)			Increased TDS from seawater intrusion	Reduced natural recharge
Recycled water (San Luis Rey WWTP)	Cost to install infrastructure			Reduced wastewater flows in drought

Reliability planning requires information about: (1) the expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; (3) how available contingency measures can reduce the impact of shortages when they occur.

The City of Oceanside is one of 24 member retail agencies of SDCWA. Member agency status entitles the City to directly purchase water for its needs from SDCWA on a wholesale basis. The City looks to SDCWA to ensure, to the best of its ability, that adequate amounts of imported water will be available to satisfy future water requirements. To maximize the reliability of the region's water supply, SDCWA is executing a long-term strategy to diversify the region's supply sources, make major investments in the region's water delivery and storage system, and improve water use efficiency.

In 1991, the San Diego region was 95% reliant on a single supplier of imported water – MWD. This made the region extremely vulnerable to water supply shortages. That year, an ongoing drought forced MWD to cut deliveries to the San Diego region by 30%. As a result of that crisis, the SDCWA Board approved a strategy to aggressively diversify its water supply portfolio by developing new local and imported water supplies. This strategy already is enhancing regional supply reliability and lessening the impact of current water cutbacks from MWD during the present drought. SDCWA is working with its 24 local member retail agencies to develop local supplies such as groundwater, recycled water, seawater desalination, and conservation. These efforts will offset demands on imported water, and on MWD in particular, while emphasizing local, drought-proof supplies. By 2020, SDCWA projects local water supplies to meet 33% of the region's water demand, while 79% of demand will be met with water acquired from sources other than MWD.

SDCWA's supply reliability analysis found that there would be reliable supplies for all years in a normal year and single-dry year scenario, while supplies would be reliable for all except the third year of a multi-dry year scenario in 2035 and 2040. This analysis was completed using a conservative methodology that only considered member agencies' "verifiable" supplies, in addition to SDCWA's supply projections and share of MWD supplies. Verifiable supplies are those that are far enough along in the planning, construction, or funding process to be considered certain during the projected planning period.

Installing Cured-In-Place-Pipe (CIPP) slip lining to rehabilitate the City's pipelines and protect against leakages and water quality contamination.

As part of the City's conservation program, the City of Oceanside adopted Ordinance No. 091-15 on March 27, 1991, which established a water conservation program for the City. The City's "Water Conservation" code was amended in 2008 through adoption of Ordinance No. 08-IR0439-1 and again in 2015 with adoption of Ordinance No. 15-OR0276-1, to revise the existing water conservation program and add drought response conservation measures to be implemented in the event of mandatory water reductions.

The City first completed a comprehensive Water Conservation Master Plan in May 2011, while the WCMP Update was completed in 2016 in conjunction with this 2015 Plan.

7.1.2 Water Quality

The City currently treats local groundwater supplies to eliminate total dissolved solids (TDS), iron, manganese, and trichloropropane that are characteristic of the groundwater in the region. Groundwater is extracted and treated at the MBGPF for delivery to the potable water system. Due to water quality issues, local groundwater must be treated in order to distribute up to 6.37 MGD of drinking water. Given current and projected operations, no water quality issues are expected to impact the City's water supply.

7.2 Reliability by Type of Year

CWC 10631

This section identifies the historical water years that meet conditions for an average water year, a single-dry year, and multiple-dry years, for drought planning purposes. Single-dry and multiple-dry year conditions are usually based on historical records of annual runoff from a particular watershed. A multiple-dry year period is generally three or more consecutive years with the lowest average annual runoff. Consistent with SDCWA's 2015 UWMP, the City's single-dry year was determined to be 2015 and multiple-dry years were 2013 through 2015. Because the City does not utilize local supplies dependent on local, short-term hydrologic conditions, the City has elected to use a 30-year average (1986-2015) as its normal year, consistent with SDCWA's 2015 UWMP**. Table 7-2** shows the City's basis for water year data.

Table 7-2 Basis of Water Year Data

DWR Table 7-1 Retail: Basis of Water Year Data		
Year Type	**Base Year**	**Available Supplies if Year Type Repeats**
		% of Average Supply
Average Year	1986-2015	100%
Single-Dry Year	2014	100%
Multiple-Dry Years 1st Year	2013	100%
Multiple-Dry Years 2nd Year	2014	100%
Multiple-Dry Years 3rd Year	2015	93%-100%
NOTES: The City as selected base years that aligned with SDCWA's 2015 UWMP supply reliability assessment. The third year of a multiple-dry year scenario may result in deficits that must be met through extraordinary conservation or further expansion of the recycled water system. In years with supply reliability, additional purchases would be made from SDCWA to meet demands. As presented here, "% of Average Supply" indicates percent supply available to meet potable demands due to diversification and/or carryover storage.		

7.3 Supply and Demand Assessment

CWC 10635

The UWMP Act requires every urban water supplier to assess the reliability of its water supply for normal, single-dry and multiple-dry years. Single-dry and multiple-dry year conditions were based on the City's historical water use records.

The City has historically conserved water during single and multiple-dry years, so the forecast demands for dry years are considered conservative. The City anticipates no reduction of groundwater supplies for any hydrologic scenario. Groundwater is generally a drought-proof supply because the City's projected extraction is well below the normal year safe yield. Both advanced treated IPR supplies and

tertiary recycled water supplies are drought-proof supplies that would remain available during all scenarios. Because there is sufficient capacity at San Luis Rey WWTP to serve recycled water as demands increase in response to dry year conditions, as recycled water demands increase, deliveries would increase to meet demand. **Table 7-3** identifies supply availability as a percent of normal year supplies for each scenario.

Demands are projected to increase during dry year scenarios, as shown in in **Table 7-3**. Because local supplies would not increase in availability, the City would need to purchase additional water from SDCWA to meet demands. For all years that SDCWA projects supply reliability, the City assumes it will be able to purchase sufficient water from SDCWA to meet demands. Should SDCWA project potential supply deficits, the City would implement extraordinary conservation or convert additional customers to recycled water. Extraordinary conservation measures are described in *Section 8 Water Shortage Contingency Planning*. As noted above, SDCWA projects potential deficits in the third year of a multiple-dry year in 2035 and 2040.

Table 7-3: Demand and Supply Assumptions, as Percent of Normal

Source	Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years		
			Year 1	Year 2	Year 3
Demands					
Potable Water	100%	107%	106%	111%	116%
Recycled Water	100%	107%	106%	111%	116%
Total Percent of Normal Demands		107%	106%	111%	116%
Supplies					
SDCWA Purchases	100%	109%	108%	Variable (114%-115%)	Variable (110%-121%)
Groundwater	100%	100%	100%	100%	100%
Advanced Treated Water	100%	100%	100%	100%	100%
Recycled Water	100%	107%	106%	111%	116%
Total Percent of Normal Potable Supplies		107%	106%	111%	Variable *(108%-116%)*
Total Percent of Overall Normal Supplies		*107%*	*106%*	*111%*	*Variable (109%-116%)*

7.3.1 Normal Supply and Demand Comparison

Table 7-4 compares current and projected water supply and demand. In average precipitation years, the City has sufficient water to meet its customers' needs, through 2040. This is based on continued commitment to the City's active and passive conservation programs, maintaining current groundwater rights, additional imported water available when needed from SDCWA, and the supply of recycled water.

Table 7-4: Normal Year Supply and Demand Comparison

DWR Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	31,728	32,915	32,813	33,190	33,537
Demand totals	31,728	32,915	32,813	33,190	33,537
Difference	0	0	0	0	0
NOTES:					

7.3.2 Single-Dry Year Supply and Demand Comparison

2015 was identified as the driest year in recent record consistent with SDCWA's 2015 UWMP. The single-dry year scenario investigates the effect of an isolated single dry period similar to this year occurring in the future.

During a single-dry year, demands are expected to increase by an average of 7%. To meet these demands, the City will continue to supply customer with groundwater, recycled water, and projected advanced treated water supplies. To make up the remaining supply, the City will purchase additional water from SDCWA. The City anticipates that SDCWA will have sufficient supplies to allow for these additional purchases because SDCWA projects 100% reliability in the single-dry year scenario with changes in demand and supply consistent with the analysis completed by the City.

In the event of a historical single-year drought, the City has sufficient water to meet its customers' needs, through 2040, as shown in **Table 7-5**.

Table 7-5: Single Dry Year Supply and Demand Comparison

DWR Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	33,886	35,153	35,044	35,447	35,818
Demand totals	33,886	35,153	35,044	35,447	35,818
Difference	0	0	0	0	0
NOTES:					

7.3.3 Multiple-Dry Year Supply and Demand Comparison

The multiple-dry period supply and demand comparison examines the effect of a historical multiple-dry period occurring in the future. The historical dry year period was identified as the three year period from 2013-2015, consistent with SDCWA's 2015 UWMP. The City has completed this analysis consistent with SDCWA's 2015 UWMP, which projected an average increase in demand of 6%, 11%, and 16% for years 1 through 3, respectively, of a multi-dry year scenario (see **Table 7-3**, above).

During an extended event, an assumption was made that recycled water production would increase to meet additional recycled water demands, while advanced treated water and groundwater supplies would remain consistent with normal year projections. To make up the remaining supply, the City will purchase additional water from SDCWA. These additional purchases are anticipated to be accommodated for all years in which SDCWA projections 100% reliability. As noted in SDCWA's 2015 UWMP, the third year of a multiple-dry year scenario has potential for a supply deficit in both 2035 and 2040. In those years, SDCWA projects a deficit of 3% and 7%, respectively. The City has

therefore reduced the potential volume of water available from SDCWA by 3% and 7% in these years from its projected need.

As shown in **Table 7-6**, the City projects a potential deficit in 2035 and 2040 during the third year. This deficit would be addressed through implementation of extraordinary conservation or conversion of additional customers to recycled water beyond that already projected. These measures would reduce demands such that available supplies would be sufficient to meet demands, as shown in **Table 7-7**.

Table 7-6: Extraordinary Conservation in the Third Year of a Multiple Dry Year Scenario (AF)

Multiple-Dry Year: Year 3	2020	2025	2030	2035	2040
Potable Supply	36,403	36,272	34,759	33,891	32,392
Potable Demand	36,403	36,272	34,759	35,011	34,903
Potential Difference	*0*	*0*	*0*	*1,120*	*2,511*
Extraordinary Conservation or Conversion to Recycled Water	0	0	0	1,120	2,511
Total Potable Demand	36,403	36,272	34,759	33,891	32,392
Difference	**0**	**0**	**0**	**0**	**0**

Table 7-7: Multiple Dry Year Supply and Demand Comparison

DWR Table 7-4 Retail: Multiple Dry Year Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First Year	Supply totals	33,759	35,022	34,913	35,314	35,683
	Demand totals	33,759	35,022	34,913	35,314	35,683
	Difference	0	0	0	0	0
Second Year	Supply totals	35,282	36,601	36,488	36,907	37,293
	Demand totals	35,282	36,601	36,488	36,907	37,293
	Difference	0	0	0	0	0
Third Year	Supply totals	36,868	38,247	38,129	37,446	36,459
	Demand totals	36,868	38,247	38,129	37,446	36,459
	Difference	0	0	0	0	0
NOTES:						

7.4 Regional Supply Reliability

CWC 10620

The City continues to evaluate supply enhancement options, including additional water recycling, desalinated seawater, increasing groundwater supplies, potable reuse, water transfers, and additional imported water supplies through its collaboration with SDCWA. The City's efforts to increase local supplies is discussed in *Section 6 System Supplies*.

SECTION 8: WATER SHORTAGE CONTINGENCY PLANNING

This section describes the City's plans and policies to address potential water shortages, including catastrophic interruptions and drought management.

8.1 Drought Ordinances

The City has two ordinances in place to establish operational procedures for long-term (drought) and short-term (catastrophic) water shortages. The two ordinances are listed and described in further detail below.

- Water Conservation Program and Drought Response Conservation Measures for Mandatory Water Reductions (Ordinance No. 08-OR0439-1)
- Updates to Water Conservation Program and Drought Response Conservation Measures (Ordinance No. 15-OR0276-1)

Water Conservation Program and Drought Response Conservation Measures for Mandatory Water Reductions (Ordinance No. 08-OR0439-1)

Originally adopted in 1991, the July 2008 updates to the City's "Drought Ordinance" established regulations to be implemented during times of declared water shortages or declared water shortage emergencies. Ordinance No. 08-OR0439-1 establishes four levels of drought response actions, with increasing restrictions on water use in response to decreasing available supplies. This ordinance was based on a model program developed by the SDCWA for its member agencies. A copy of the ordinance is included in **Appendix E**.

Updates to Water Conservation Program and Drought Response Conservation Measures (Ordinance No. 15-OR0276-1)

The most recent amendment to the City's "Drought Ordinance" occurred in May 2015 to incorporate Governor Brown's 2014 state of emergency proclamation for drought and the 2015 Executive Order for 25% reduction of water use statewide. The City first escalated the drought response level from a Level 1 Drought Watch to a Level 2 Drought Alert in August 2014. SDCWA and its member agencies were able to analyze the effectiveness of the drought response program during this timeframe. The City then revised the Levels 1 and 2 drought conditions with the adoption of Ordinance No. 15-OR0276-1. A copy of the ordinance is included in **Appendix E.**

8.2 Stages of Action

CWC 10632(a)(1)

The water management stages shown in **Table 8-1** are a sequential, regulatory program of increasingly stringent prohibitions on the use of water delivered within the City. As described above, the City's Drought Ordinance establishes four levels of drought response actions to be implemented in times of shortage. When the City declares that a particular stage is in effect, City customers must comply with all regulations contained in the declared stage. In order to encourage water use efficiency and awareness, the City never operates at a level below Level 1.

Table 8-1: Stages of Water Shortage Contingency Plan

DWR Table 8-1 Retail: Stages of Water Shortage Contingency Plan		
Stage	**Percent Supply Reduction[1]**	**Water Supply Condition**
1	up to 10%	Drought Watch Condition
2	up to 20%	Drought Alert Condition
3	up to 40%	Drought Critical Condition
4	above 40%	Drought Emergency Condition
[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%. NOTES: Level 4 includes provisions to establish water budgets or allocations as necessary, and addresses water shortages of 50%.		

The City's Drought Ordinance establishes regulations to be implemented during the water shortage levels listed in **Table 8-1** with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies. During a Drought Response Level 1 condition, water waste is prohibited and the City encourages consumers to follow the Level 1 water conservation measures. During a Drought Response Level 2 condition or higher, the established water conservation measures and water use restrictions are mandatory and violations are subject to criminal, civil, and administrative penalties and remedies specified in this ordinance and as provided by the City's Administrative or Municipal Code.

Drought Response Level 1 – Drought Watch

A Drought Response Level 1 condition occurs when SDCWA notifies its member agencies that supply shortages may occur due to drought. During these conditions, member agencies are encouraged to implement voluntary demand reduction of up to 10% to ensure sufficient supplies will be available to meet anticipated demands. The City's never operates at a level below Drought Response Level 1 in order to encourage water use efficiency at all times.

During a Drought Response Level 1, the City actively promotes water efficiency through public education and outreach to increase public awareness of the need to implement the water conservation measures listed in **Table 8-2**. The conservation practices encouraged during a Level 1 condition include:

- Stop the use of potable water to wash paved surfaces
- Stop water waste resulting from inefficient landscape irrigation
- Water landscaped areas not irrigated by an irrigation system by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation
- Irrigate landscapes before 10 a.m. or after 6 p.m. only
- Use recirculating ornamental fountains only
- Restaurants serve water only upon request
- Hotel and other commercial lodging offer guest the option of not laundering towels and linens daily
- Repair all water leaks within five days of notification by the City
- Use non-potable water for construction purposes when available

Drought Response Level 2 – Drought Alert

A Drought Response Level 2 condition occurs when SDCWA notifies its member agencies that demand reductions of up to 20% are required in order to maintain sufficient supplies to meet anticipated demands. The City declares a Level 2 condition through adoption of a resolution by City Council. With the declaration of a Level 2 drought condition, mandatory water use restrictions are implemented. All restrictions under Level 1 must continue to be adhered to, with the addition of the following mandatory measures:

- Limit landscape irrigation to no more than two assigned days per week (added emergency measure per Ordinance No. 15-OR0276-1)
- Limit irrigation using sprinklers to no more than ten minutes per assigned day
- Water landscaped areas not irrigated by an irrigation system by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation
- Stop irrigation with potable water of ornamental turf on public street medians
- Repair all leaks immediately upon notification by the City
- Stop operation of ornamental fountains or other decorative water features unless recirculated water is used
- Stop all watering during and forty-eight hours following measurable precipitation
- Stop irrigation with potable water of landscapes outside of newly constructed homes and buildings

Drought Response Level 3 – Drought Critical

A Drought Response Level 3 condition occurs when SDCWA notifies its member agencies that demand reduction of up to 40% is required in order to have sufficient supplies available to meet anticipated demands. All water users shall continue to comply with water conservation measures under Level 1 and Level 2 during a Drought Response Level 3 with the addition of the following mandatory conservation measures:

- Limit landscape irrigation to no more than two assigned days per week
- Water landscaped areas not irrigated by an irrigation system by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation
- Stop filling or re-filling ornamental lakes or ponds, except to the extent needed to sustain aquatic life of significant value
- Stop washing vehicles except at commercial carwashes that re-circulate water
- Repair all leaks immediately upon notification by the City

Additionally, with the declaration of a Drought Response Level 3 condition, no new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statement of immediate ability to serve or provide potable water service shall be issued. During Drought Response Level 3, the City may choose to implement an offset program that allows for continued development so long as they offset potable demands with recycled water retrofits or infrastructure. The City will suspend consideration of annexations to its service area. The City may establish a water allocation for properties within its service area.

Drought Response Level 4 – Drought Emergency

A Drought Response Level 4 condition occurs when SDCWA declares a water shortage emergency and notifies its member agencies that a demand reduction of more than 40% is required to in order for the City to have maximum water supplies available to meet anticipated demands. The City will declare a Level 4 Drought Emergency in the manner and on the grounds provided in CWC Section 350. All water conservation measures under Levels 1, 2, and 3 shall continue to be adhered to with the addition of the following measure:

- Stop all landscape irrigation, except crops and landscape products of commercial growers and nurseries

Additionally, the City may establish a water allocation for properties within its service area.

8.3 Prohibitions

CWC 10632(a)(4); 10632(a)(5); 10632(b); Health and Safety Code Section 115921(a)

In accordance with California Urban Water Conservation Council Best Management Practice 13, the City prohibits gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

The City also support efforts to develop state laws regarding exchange-type water softeners that would: (1) allow the sale of only more efficient, demand-initiated regenerating (DIR) models; (2) develop minimum appliance efficiency standards that (a) increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used; and (b) implement an identified maximum number of gallons discharged per gallon of soft water produced; (3) allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the re-claimed water or groundwater supply.

Further, the City has declared that at no time shall water be wasted or used unreasonably. Unreasonable uses of water include, but are not limited to, the following:

- Failure to repair a water leak after notification from the City and opportunity to do so.
- Failure to stop water waste resulting from conditions such as inefficient landscape irrigation excessive runoff, low head drainage, overspray of water flows onto non-targeted areas, overspray of water flows onto adjacent property, overspray and water flow onto non-irrigated areas, overspray and water flow onto roadways and adjacent structures.

As described above, the City implements mandatory water use restrictions with the Drought Response Levels 2, 3, and 4. **Table 8-2** presents the City's mandatory prohibitions and indicates at which drought stage the prohibitions takes effect.

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses

DWR Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other - Prohibit use of potable water for washing hard surfaces		No
1	Landscape - Restrict or prohibit runoff from landscape irrigation		No
1	Landscape - Limit landscape irrigation to specific times	Irrigation must take place before 10 a.m. or after 6 p.m.	No
1	Other - Require automatic shut of hoses		No
1	CII - Other CII restriction or prohibition	Limit landscape irrigation to specific times for nursery or commercial growers	No
1	Water Features - Restrict water use for decorative water features, such as fountains	With the exception of features that use re-circulated water	No
1	CII - Restaurants may only serve water upon request		No
1	CII - Lodging establishment must offer opt out of linen service		No
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks must be repaired within 5 days	No
1	Other	Non-potable water must be used for construction purposed when available	No
2	Landscape - Limit landscape irrigation to specific days	Limited to two assigned days per week	Yes
2	Landscape - Other landscape restriction or prohibition	Limit irrigation using sprinklers to no more than 10 minutes per day	Yes
2	Landscape - Other landscape restriction or prohibition	Stop irrigation with potable water of ornamental turf on public street medians	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks must be repaired immediately	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	With the exception of features that use re-circulated water	Yes

DWR Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2	Landscape - Other landscape restriction or prohibition	Stop all watering during and 48 hours following measurable precipitation	Yes
2	Other	Stop irrigation with potable water outside newly constructed homes and buildings	Yes
3	Landscape - Limit landscape irrigation to specific days	Residential and commercial landscape irrigation limited to two assigned days per week from June - October and one day per week from November - May	Yes
3	Other water feature or swimming pool restriction	Stop filling or re-filling ornamental lakes or ponds except to the extent needed to sustain aquatic life	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
4	Landscape - Prohibit all landscape irrigation	With the exception of crops and landscape products of commercial growers and nurseries or other listed exceptions	Yes
NOTES:			

8.4 Penalties and Charges

CWC 1063(a)(6)

The City of Oceanside does have provisions for penalties and charges for excessive use and mandatory prohibition violations. These are shown in **Table 8-3**.

Table 8-3: Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
Section 37.109 of the City Code provides that penalties for violation of the code sections related to water conservation are punishable as misdemeanor crimes under section 1.7 (a) (1) of the City Code with fines not to exceed $1,000 or imprisonment for a term not exceeding six months or both.	2
The City's Water Conservation Ordinance includes provisions that water service can also be discontinued or limited to any customer who uses excessive water in a drought.	2

8.5 Consumption Reduction Methods

CWC 10632(a)(5)

The City of Oceanside's Water Shortage Contingency Plan (WSCP) also provides consumption reduction methods to reduce water use in the most restrictive stages. These methods are listed in **Table 8-4**.

Table 8-4: Stages of WSCP - Consumption Reduction Methods

DWR Table 8-3: Retail Only: Stages of Water Shortage Contingency Plan – Consumption Reduction Methods		
Stage	**Consumption Reduction Methods by Water Supplier**	**Additional Explanation or Reference**
1	Expand Public Information Campaign	
1	Provide Rebates on Plumbing Fixtures and Devices	
1	Provide Rebates for Landscape Irrigation Efficiency	
1	Provide Rebates for Turf Replacement	Only when funds are made available
1	Offer Water Use Surveys	
3	Moratorium or Net Zero Demand Increase on New Connections	
3	Implement or Modify Drought Rate Structure or Surcharge	
3	Other	Water allocations may be established
4	Moratorium or Net Zero Demand Increase on New Connections	
4	Implement or Modify Drought Rate Structure or Surcharge	
4	Other	Water allocations may be established
NOTES:		

8.6 Determining Water Shortage Reductions

CWC 10632(a)(5)

Under normal conditions, the City monitors water sales and deliveries on a monthly basis. It also continually monitors water levels at Weese WFP to gauge water supply and demand conditions. All of the City's water connections are metered with each individual meter are read monthly. The City prepares monthly sales and delivery reports which are reviewed and compared to reports and statistics from prior months and the same period of the prior year. Under shortage conditions, the City will determine water savings made from implementing the stages of the WSCP by reviewing and comparing production reports.

8.7 Revenue and Expenditure Impacts of Water Shortage

CWC 10632(a)(7)

It is difficult to precisely gauge the revenue and expenditure impacts of implementation of the WSCP. The plan provides for prohibitions on outdoor water use and requests for indoor use reductions, enforced by misdemeanor penalties for violation. Ultimate impacts will be based upon a mix of responses to these requirements and overall public cooperation in saving water in additional ways. Revenue will be reduced through lower water sales. However, the City will see this compensated to some degree by lower water purchase, pumping and treatment charges.

During the most recent cutbacks, the City has experienced revenue impacts. The following is the City's estimate for revenue loss due to conservation efforts, most significantly in CY 2015 as a result of the State's Emergency Conservation Regulation. These figures assume that percent reductions have a direct offset on all volumetric based charges (i.e., water sales, SDCWA surcharges, clean water surcharge). Estimates are based on data that was available and should be used for judging order of magnitude only. It should also be noted that these estimates do not represent direct reductions to the City's net operating revenues, because there are offsetting reductions in expenditures that also occur with reduced consumption levels.

- FY 2014/15 – Approximately -9.4% consumption reduction from FY 2013/14 levels, which resulted in approximately $2 million in reduced revenues
- FY 2015/16 – Approximately -17.5% consumption reduction from FY 2014/15 levels, which will total -25% reduction in consumption (and associated revenue reduction) from FY 2013/14 levels

For planning purposes, it is assumed that City's consumption reduction targets are met for each WSCP stage. Revenue losses are proportional to the commodity rate revenue not received, less variable cost reductions for treated water purchases from the SDCWA. No additional costs are assumed for WSCP (code) enforcement. While most water savings are likely to accrue from less outdoor water use there will also be revenue losses from somewhat less sewage produced and treated. For purposes here, and since the City charges a commodity charge on estimated sewage flow and can control that charge, revenue losses are assumed to be offset by collection and treatment cost reductions.

8.8 Measures to Overcome Impacts

Impacts during Drought Response Levels 1 through 4 would likely be absorbed by City reserves without requiring a rate increase provided the shortage condition did not persist for more than a year. Impacts beyond a year or impacts from a greater level of shortage would need to be individually assessed. Measures to reduce expenses would be considered during a shortage such as reduction in capital expenditures, deferring non-critical maintenance items and deferring filling of personnel vacancies. Should revenue loss impacts begin to affect essential water system operations, the City has established a drought rate structure to offset loss of revenue.

As a conservation measure, the City has established a Drought Rate Structure, per Ordinance No. 09-OR0336-1, to be implemented to achieve the water reduction targets established in the City's Drought Ordinance in the event of mandatory water reductions. The following tables (**Tables 8-5** through **8-7**) show the rate increases to be implemented during each drought level.

Table 8-5: Level 2 Drought Alert Rates: up to 20% Mandatory Reduction

Level 2 Drought Alert Rates: up to 20% Mandatory Reduction			
Service Fee Surcharge (per account): 10% higher than the current monthly rate (per meter equivalent)			
Commodity Charge: 1 unit = 748 gallons	Range	Reduction up to 10% - Increase Over Current Rate	Reduction up to 20% - Increase Over Current Rate
Single Family			
First Tier	0-13 units	0%	0%
Second Tier	14-20 units	25%	60%
Third Tier	21+ units	45%	100%
Multi Family			
First Tier	0-7 units	0%	0%
Second Tier	8-14 units	20%	55%
Third Tier	15+ units	40%	109%
Irrigation	per unit	20%	40%
Non-Residential/ Commercial Agricultural	per unit	15%	25%

Table 8-6: Level 3 Drought Alert Rates: up to 20% Mandatory Reduction

Level 3 Drought Alert Rates: up to 20% Mandatory Reduction		
Service Fee Surcharge (per account): 25% higher than the current monthly rate (per meter equivalent)		
Commodity Charge: 1 unit = 748 gallons	**Range** 1 unit = 748 gallons	**Increase over Current Rate**
Single Family		
First Tier	0-11 units	0%
Second Tier	12-18 units	70%
Third Tier	19+ units	120%
Multi Family		
First Tier	0-7 units	0%
Second Tier	8-14 units	65%
Third Tier	15+ units	115%
Irrigation	per unit	60%
Non-Residential/ Commercial Agricultural	per unit	40%

Table 8-7: Level 4 Drought Alert Rates: up to 20% Mandatory Reduction

Level 4 Drought Alert Rates: up to 20% Mandatory Reduction		
Service Fee Surcharge (per account): 30% higher than the current monthly rate (per meter equivalent)		
Commodity Charge: 1 unit = 748 gallons	Range	Increase over Current Rate
Single Family		
First Tier	0-5 units	0%
Second Tier	6-10 units	80%
Third Tier	11+ units	150%
Multi Family		
First Tier	0-4 units	0%
Second Tier	5-8 units	75%
Third Tier	9+ units	145%
Irrigation	per unit	80%
Non-Residential/ Commercial Agricultural	per unit	50%

Because the City's accounts are fully metered, accounting for actual consumption can be monitored. Water production records will be examined monthly and compared against historical average monthly consumption data for that period. This data will be analyzed to assess any need for alterations to the WSCP.

8.9 Catastrophic Supply Interruption

CWC 10632(a)(3)

To prepare for a potential catastrophic water supply interruption, the City has been diversifying its local water supply sources. As described in *Section 6 System Supplies*, the City is pursuing expansion of groundwater use, implementation of potable reuse, and exploring seawater desalination opportunities. Development of local supplies helps to reduce risk of supply interruption from larger, more extensive imported water systems (whose supplies could be affected by events distant from the City, and whose size presents additional opportunities for an interruption event), while regional efforts to diversify supplies, such as the Carlsbad Desalination Plant, provide additional sources of supply. In addition, the City has multiple interties with neighboring agencies (see *Section 6 System Supplies*), and has developed additional relationships with its neighbors through the NSDWRC.

The City's Emergency Plan identifies the Construction and Engineering Branch of the Utilities Department as responsible for the restoration of water and wastewater facilities. In the event of a water emergency, this branch is responsible for surveying and restoring disrupted systems, developing a damage assessment, and assisting other branches with construction or engineering needs.

8.10 Minimum Supply Over the Next Three Years

The UWMP Act requires that urban water suppliers quantify the minimum water supply available during the years 2016, 2017, and 2018 based on the driest three-year historic period, which were 2013, 2014, and 2015. As described in *Section 7 Supply Reliability Analysis*, the City anticipates 100% reliability in all but the third year of a multiple-dry year scenario in 2035 and 2040. Those years may experience shortages in the absence of extraordinary conservation because population-based demand growth are anticipated to outpace supply growth in the region. However, in the near future, supplies are sufficient to meet demands, even in dry years. As such, the City projects the minimum available supply to mirror its projected demands. Demands were projected for 2016 through 2018 using a straight-line increase from 2015 to 2020. As shown in **Table 8-8**, the total water supplies given a repeat of historically low conditions on all water supplies would range from 25,400 AF to 28,754 AF for 2016 through 2018. Comparing these supplies to the demand projections provided in *Section 4 System Demands*, the City has adequate supplies available to meet projected demands should a multiple-dry year period occur within the next three years.

Table 8-8: Minimum Supply Next Three Years

DWR Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	25,319	26,921	28,524
NOTES:			

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SECTION 9: DEMAND MANAGEMENT MEASURES

CWC 10631(f) (1)(A); CWC 10631(f)(A); CWC 10631(f)(B)(i) through CWC 10631(f)(B)(vii); CWC 526(a); CWC 257(b)

This section describes the demand management measures (DMM) undertaken by the City and quantify DMM efforts from 2011 through 2015.

9.1 Demand Management Measures

The following sections describe the DMMs that have been implemented by the City of Oceanside over the past 5 years, along with planned implementation to achieve water use targets.

9.1.1 Water Waste Prevention Ordinances

The City has three ordinances in place to give the City the authority to prohibit water waste and encourage water use efficiency within the service area. Each ordinances is updated as-needed to stay current with State regulations. The three ordinances are listed and described in further detail below.

- Updates to Water Conservation Program and Drought Response Conservation Measures (Ordinance No. 15-OR0276-1)
- Water Efficient Landscaping (Ordinance No. 10-OR0412-1)
- Recycled Water (Ordinance No. 14-OR0565-1)

Updates to Water Conservation Program and Drought Response Conservation Measures (Ordinance No. 15-OR0276-1)

The most recent amendments to the City's "Drought Ordinance" occurred in 2015 to incorporate Governor Brown's 2014 state of emergency proclamation for drought and the 2015 Executive Order for 25% reduction of water use statewide. This ordinance clarifies the four drought response levels and describes the water use restrictions and required reductions for each stage. A copy of the ordinance is included in **Appendix E**.

Water Efficient Landscaping (Ordinance No. 10-OR0412-1)

To ensure compliance with the State's Water Conservation in Landscaping Act, this ordinance was implemented to include 2006 development landscape design requirements and is written to be as effective as the State's Model Water Efficient Landscape Ordinance. This ordinance si currently in the process of being updated.

The City replaced landscaping with artificial turf underneath and alongside the Oceanside Pier to reduce water use

Recycled Water (Ordinance No. 14-OR0565-1)

The ordinance establishes the authority for the City to enforce connection to and use of recycled water where applicable. A copy of the ordinance is included in **Appendix G.**

Planned Implementation to Achieve Water Use Targets

The City will maintain and expand its water waste prevention ordinances as needed to meet demand management goals established in this 2015 Plan.

9.1.2 Metering

All water service connections are metered and billed according to water consumed. The City does have Commercial/Industrial mixed-use meters and after a preliminary in-house feasibility study was performed concluded that the potential water savings to separate out the irrigation water usage with an additional meter would be small and unnoticeable and cost prohibitive. Therefore, the project has not perused further.

The City has an active water meter replacement program in place to continually change out older meters based on staff availability each month.

Planned Implementation to Achieve Water Use Targets

The City is planning to implement an advanced metering infrastructure (AMI) program, initially for its dedicated irrigation customers, with potential for future expansion. AMI, in concert with a web-based interface software (WaterSmart), will provide real-time consumption data to facilitate early identification of water loss, allow customers to track daily water use, and provide a mechanism for ongoing outreach and communication between the City and its customers. It will also allow the City to notify customers of overwatering throughout the month, rather than only once month.

9.1.3 Conservation Pricing

The City has and will continue to utilize a combination of uniform and increasing block or tiered rate conservation rate structures. Residential customers comprised of single family, master-metered residential, and multifamily customer classes are billed in increasing block structures where the water rate increases with additional water units consumed. **Table 9-1** shows the proposed residential customer billing rates for 2016. Commercial, agricultural, and irrigation customer classes are billed using uniform rate structures where a flat rate is billed for every unit consumed. **Table 9-2** shows the proposed billing rates for commercial customers.

Table 9-1: Residential Customer Billing Rates

Tier	Block Structure	Cost per Unit
Single Family and Master – Metered (per dwelling unit)		
Tier 1	0 – 13 units	$2.21/unit
Tier 2	14 units and above	$2.76/unit
Multiple Family (per dwelling unit)		
Tier 1	0 – 7 units	$2.21/unit
Tier 2	8 units and above	$2.69/unit

Table 9-2: Commercial Customer Billing Rates

Tier	Cost per Unit
Commercial Ag rate	$2.43/unit
Special Ag Rate	$1.76/unit
Irrigation rate	$2.44/unit
Commercial rate	$2.36/unit

Planned Implementation to Achieve Water Use Targets

The City will maintain and expand its conservation pricing as needed to meet demand management goals established in this 2015 Plan.

9.1.4 Public Education and Outreach

The City engages in a variety of public education and outreach efforts to improve water use management, education, and efficiency. These programs are described here.

Outreach Activities

The City provides water conservation messaging to customers through their dedicated water conservation website www.SaveWaterOceanside.com which contains water conservation tips, rebate program information, water saving videos, and important links to other water conservation websites and regional partners.

The City staffs a 'Save Water Oceanside' booth dedicated to promoting water conservation at several events throughout the year. Displayed are brochure handouts containing indoor and outdoor water saving information and conservation tools as free giveaways. Giveaway items include toilet leak dye tabs, water saving buckets, hose nozzles, soil moisture meters, shower timers, shower gauge bags, and San Diego Gas & Electric Water and Energy Saving kits.

In order to reach a wide range of audiences, the City has brochures and handouts available at various community centers and City offices. Bill inserts are included with utility bills to announce available programs and important water conservation reminders. The City has consistently reached out to customers using various methods every quarter within the last five years. In coordination with SDCWA, the City promotes opportunities for residents to participate in regional programs such as Green Oceanside Business Network certification, California-Friendly landscape contest, Speaker Bureaus, and Citizens Water Academy.

Workshops

The City, in coordination with SDCWA, provides workshops on water related themes geared to the residential user. Workshop topics provided in the past include California Friendly Landscape Training and Fix-a-Leak. Workshops are offered for free and held at different locations through the county, with at least two workshops held in a City of Oceanside facility.

Marketing for workshops occurs by the City through strategically placed poster notices at various public locations such as libraries, community centers, and garden centers, as well as through email blasts or bi-monthly bill stuffer notifications.

School Education

The City offers two school education programs for local schools as well as education materials to teachers upon request through SDCWA. The Splash Lab offers assembly presentations available to grades K – 6 to educate students on water science. For Grades 4 – 6, students can participate in a mobile water lab for a hands-on experience learning water related topics.

The City holds a poster contest for 4th graders to compete for inclusion in the City's annual water conservation calendar. The top posters are incorporated into the calendar that includes tips conservation tips and reminders. The poster is provided as a giveaway item to customers.

Residential Customer Rebates

In combination with the SoCal WaterSmart Program managed by MWD, rebates are available to upgrade water fixtures to be more water efficient. **Table 9-3** provides a list of all rebates available and associated rebate amounts for residential customers.

A popular program that exhausted funds in 2015 was the turf removal rebate program designed to encourage the replacement of water thirsty turf for drought tolerant plants. The program has gathered about 900 participants since it began in 2014. Rebates for clothes washers and high efficiency (HE) toilets continue to be popular programs gathering participation of just over 2,000 fixtures replaced for each rebate program.

Table 9-3: Residential Water Conservation Rebate

Rebate Program Name	Rebate Amount
Indoor Fixtures	
Turf removal rebate	$2/sqft up to $6,000
Clothes washer rebate	$135
HE toilets	$100
Outdoor Fixtures	
Irrigation controllers	$80
Irrigation nozzles	$4/nozzle - minimum is 15
Rain barrels	$75
Soil moisture sensors	$35/controller station

Commercial Customer Rebates

The City, in combination with SoCal WaterSmart Program managed by MWD, provides rebates geared towards commercial customers to promote water efficiency. **Table 9-4** displays the rebates available grouped into market sectors with associated amounts available per rebate for commercial customers. Within the last five years the most applied for rebates programs by commercial customers include HE toilets with about 160 toilets replaced and turf removal rebates with 62 sites applying for the program.

Table 9-4: Commercial Water Conservation Rebates

Rebate Name	Rebate Amount
Indoor Fixtures	
HE toilet	$100 or $145 (for more efficient 4- liter)
Flush meters	$100
UL Urinal	$200
Zero Water urinal	$200
Flow valve restrictions	$5/valve
Outdoor Fixtures	
Turf removal	$2/sqft up to $6,000
Irrigation controllers	$35/controller station
Irrigation heads	$4/nozzle
Flow regulators	$1
Soil moisture sensors	$35/station
Restaurant Fixtures	
Connectionless food steamers	$485
Air-cooled ice machines	$1,000
Commercial Industrial	
Cooling tower conductivity controllers	$625
Cooling tower pH controllers	$1,750
Dry vacuum pump	$125
Laminar flow restrictors	$10/restrictor

Water Smart Check-up Program

The City has offered, and will continue to offer, the Water Smart Check-up program in coordination with SDCWA, where a WaterSmart representative visits a property upon request to provide water saving tips and perform a water audit which includes an inventor of water fixtures used indoors and outdoors, replacing high use water fixtures, evaluating toilets for leaks, and performing a landscape water audit turning on stations to evaluate for inefficiencies and adjusting water schedules where appropriate. A summary report with additional conservation advertising is left with the customer at the end of the appointment.

Planned Implementation to Achieve Water Use Targets

The City will continue to support numerous public outreach, education, and rebate programs to support demand management. The City's WCMP Update identifies the following suite of activities in the City's "toolbox" of conservation programs to be implemented to achieve water use targets:

1. Single Family Indoor Water Surveys
2. High Efficiency Faucet Aerator, Showerhead, and Soil Moisture Sensor Giveaway
3. Residential Clothes Washer Rebate
4. Residential Outdoor Water Surveys
5. Large Landscape Outdoor Water Audit

6. Large Landscape Water Budgeting/Monitoring
7. Rotating Sprinkler Nozzle Rebates
8. Provide Rain Barrel Incentive
9. Top Water Users Program (Top Customers from Each Customer Category)
10. CII Rebates to Replace Inefficient Equipment
11. Require Plan Review for New CII
12. Promote High Efficiency Pre-Rinse Spray Valves
13. Public Information
14. School Education
15. Incentive for Recycled Water Conversions
16. Agricultural Water Audit Program

9.1.5 Programs to Assess and Manage Distribution System Real Loss

The City has completed the AWWA Water Loss Audit Software program and has determined that water losses are within the acceptable industry standard range. The City is proactive in reducing unaccounted for water by ensuring water meters are regularly maintained, evaluated for functionality, and replaced at industry standards.

Reported leaks are investigated and recorded in a tracking database that collects the time of report, leak location, and type of leaking pipe or fitting. Leaks are repaired to the extent that is cost effective and prioritized based on potential water loss.

Planned Implementation to Achieve Water Use Targets

The City will continue to survey and correct its own infrastructure system and processes to reduce system real loss.

9.1.6 Water Conservation Program Coordination and Staffing Support

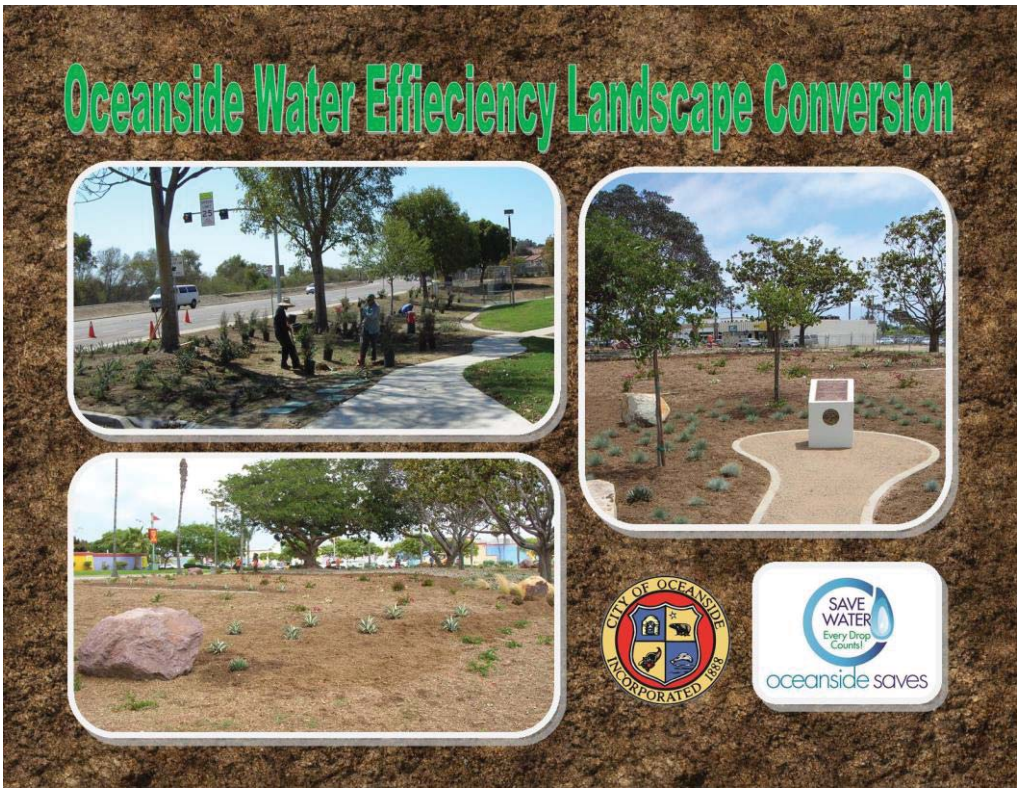
Water Conservation program coordination is staffed by a full time Professional Assistant who works as the Water Conservation Coordinator under the direction and supervision of the Senior Management Analyst and program manager for Water Conservation. The City's Water Conservation Program Manager is Ms. Teresa Gomez, (760) 435-5815, tkgomez@ci.oceanside.ca.us.

Planned Implementation to Achieve Water Use Targets

The City maintains both a Water Conservation Coordinator and Program Manager as point of contact for demand management activities.

9.1.7 Other Demand Management Measures

To reduce water use and help promote the turf rebate program (which has since run out of funding due to demand), the City reduced turf at City Parks and Facilities. To date, the City has reduced turf at twenty-two City parks and facilities. Information regarding each renovated site is available on the web site and includes before and after pictures, square footage of turf replaced, and anticipated water savings. Within the City's service area, 55 residential and 2 commercial customers participated in the regional turf conversion rebate program managed by SDCWA. In total, 65,926 square feet of turf was converted by the City's customers under this program.



Drought Efforts

Drought restrictions began in June 2015 with the goal to achieve the state-mandated 20% reduction in water use. The City announced through direct mailing to all customers that the City was initiating a Stage 2 Drought Alert Condition Response which incorporates a mandatory two day watering limit to all customers for outdoor irrigation (see *Section 8 Water Shortage Contingency Planning*). Restaurants were offered table tent cards announcing water will be served upon request, hotels were offered door hangers encouraging reusing towels and free shutoff nozzles were offered to slip renters at the harbor to reduce water use for boat wash-down. The City created signs to be placed in prominent areas around town providing conservation messages, including resident's yards to announce their commitment for saving water.

To facilitate enforcement, the City initiated a water waste reporting online form to allow customers to report observations of water waste. The City followed up on the reports of water waste through drought violation door hangers and administrative fines of up to $1,000 for repeat offenders.

Planned Implementation to Achieve Water Use Targets

The City will continue to implement drought management conditions as needed, including water waste reporting and investigations.

9.2 California Urban Water Conservation Council Reporting

The City is a signatory of the CUWCC, and reports their water conservation activities every two years. BMP annual reports for years 2013 – 2014 are included in **Appendix H**. The reports provide documentation that the City is in full compliance with the MOU.

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SECTION 10: PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

CWC 10608.26(a); CWC 10621(b) through (c); CWC 10635(b); CWC 10642; Government Code 6066; CWC 10644(a)(1); CWC 10645

This section of the UWMP addresses the steps the City of Oceanside has taken to adopt this UWPM and submit it to DWR, along with the steps that will be taken should it prove necessary to amend this UWMP.

10.1 2015 Water Use Data

In order to demonstrate compliance with SBx7-7, this 2015 Plan contains water for use and planning data for the entire calendar year of 2015. Data from 2015 is documented whenever it appears throughout the plan.

10.2 Plan Noticing and Adoption

A 60-day notice of release of this 2015 Plan and the public hearing was sent to San Diego County and adjacent cities and other entities on March 30, 2016. A notification of a change in the hearing date was sent to all of the same entities on June 1, 2016. The notification list is included in **Appendix I** and summarized in **Table 10-1**.

Table 10-1 Retail: Notification to Cities and Counties

DWR Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Carlsbad City of Escondido	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
San Diego County	☑	☑

The UWMP was made available for review from May 10, 2016 to June 22, 2016 at the City's Water Utilities Department (300 North Coast Highway, Oceanside, California 92054) and on the City's website at http://www.ci.oceanside.ca.us/gov/water/admin/uwmp.asp. A Notice of Public Hearing was published in the San Diego Union Tribune, North County Edition on June 8, 2016 and June 15, 2016 to notify interested parties that the UWMP was available and the date/time of the public hearing.

A public hearing was held on June 22, 2016 at City Council Chambers, 300 North Coast Highway, Oceanside, California 92054 to present, receive comments, and solicit feedback on this 2015 UWMP. The public hearing was open to the public and all interested parties were welcome to attend. The City reviewed all of the comments received and revised the UWMP accordingly. Immediately following the public hearing, the City Council adopted the 2015 UWMP on June 22, 2016 by Resolution No. 16-R0431-1, as included in **Appendix J**.

10.3 Plan Submittal

Within 30 days of adoption, the City submitted copies to DWR, SDCWA, California State Library, and County of San Diego, in addition to placing the adopted 2015 UWMP on the City's website at http://www.ci.oceanside.ca.us/gov/water/admin/uwmp.asp. The submittal to DWR was electronic, completed through the WUEdata online submittal tool.

The City shall implement the adopted UWMP in accordance with the schedule described herein and as capital funding is available.

10.4 Plan Amendment

If an amendment to this UWMP is necessary due to changing water supply conditions within the City and/or comments from DWR, the City Council will recirculate all required public notices and host a public hearing to consider public comments prior to approval of the amendment.

SECTION 11: REFERENCES

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Appendix A - UWMP Checklist

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Table F1
Checklist Arranged by Water Code Section

CWCSection	UWMP Requirement	Subject	Guidebook Location	UWMP Location
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	Section 5.2
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5 and App E	Sections 5.1, 5.2, and 5.3
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply is the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	Section 5.2
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	Section 5.2 and 5.3
1608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	N/A
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	Section 10.2
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	N/A
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Section 5.2 and Appendix B
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	Section 2
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	Section 2.1
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	Section 7.4
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Sections 2.1 and 10.2
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections10.3.1 and 10.4	Section 10.3
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 3.1
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 3.1.2
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	Section 3.2
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	Section 3.2
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 3.2
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	Section 6.1
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	Section 6.3
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	Section 6.3
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	Section 6.3
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	Section 6.3

10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	Section 6.3
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	Section 6.3.2
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2and 6.9	Section 6.1 and Table 6-4
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	Section 7
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	Section 7.3
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	Section 7
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	Section 6.6
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	Section 4.2
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	Section 4.2.2 and Appendix D
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2and 9.3	Section 9.1
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1and 9.3	N/A
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	Section 6.9
10631(i)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 6.7
10631(j)	CUWCC members may submit their 2013- 2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	Section 9.2 and Appendix H
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	Section 2.1
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	N/A
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	Section 4.2.3
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	Section 8.2
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three- year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	Section 8.10
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	Section 8.9
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	Section 8.3
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	Section 8.5
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	Section 8.4
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	Section 8.7

10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	Appendix E
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	Section 8.6
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	Section 6.8
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	Section 6.8.1
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	Section 6.8.1
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3and 6.5.4	Section 6.8.1
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	Section 6.8.2
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	Section 6.8.2
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	Section 6.8.3
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	Section 6.8.3
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	Section 7.1.2
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	Section 7.3
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	Section 10.2
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	Section 2.1 and 2.2
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Section 10.2 and Appendix I
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	Section 10.2 and Appendix I
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Section 10.2 and Appendix J
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	Section 10.3
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	Section 10.3
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections10.4.1 and 10.4.2	Section 10.3
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	Section 10.3

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Appendix B - Required Tables: DWR and SBx7-7

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DWR Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
CA3710014	City of Oceanside	43,755	25,073
	TOTAL	43,755	25,073
NOTES:			

DWR Table 2-2: Plan Identification		
☑	Individual UWMP	
☐	Regional UWMP (RUWMP)	
	Select One:	
	☐	RUWMP includes a Regional Alliance
	☐	RUWMP does not include a Regional Alliance
NOTES:		

DWR Table 2-3: Agency Identification	
Type of Agency	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP	
Unit	AF
NOTES:	

DWR Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
San Diego County Water Authority
NOTES:

DWR Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
	171,183	176,510	181,489	186,140	187,397	188,428
NOTES: Population for 2015 calculated as midpoint between the 2010 Census and 2020 SANDAG forecast Source: SDCWA. 2015. SANDAG Series 13 Growth Forecast for the City of Oceanside.						

DWR Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Single Family	Single family residential detached dwelling	Drinking Water	**9,500**
Multi-Family	More than one residential dwelling unit serviced by the meter: Duplex, townhome, condominium, apartments, mobile homes.	Drinking Water	**3,982**
Commercial	Non-residential domestic service	Drinking Water	**2,047**
Industrial	Businesses whose discharge to the wastewater system have high concentrations of BOD, TSS and /or ammonia.	Drinking Water	**922**
Landscape	Water only account	Drinking Water	**3,856**
Agricultural irrigation	Irrigation of commercially grown crops or other dedicated agricultural connections.	Raw Water	**1,345**
Sales/Transfers/Exchanges to other agencies	Fall / Olive Exchange	Drinking Water	**6**
Losses	Losses	Drinking Water	**1,955**
		TOTAL	**23,613**

NOTES: Governmental uses were converted to either Irrigation or Commercial beginning in January 2015. The AWWA Water Loss Audit included as Appendix D was completed for FY2015, and reflects a lower loss than the estimated loss for calendar year 2015. Reported here is the estimated water loss for calendar year 2015, based on teh difference between production and sales.

DWR Table 4-2 Retail: 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
Single Family	Single family residential detached dwelling; includes the Fall/Olive Exchange	13,464	13,225	12,726	12,548	12,418
Multi-Family	More than one residential dwelling unit serviced by the meter:Duplex, townhome, condominium, apartments, mobile homes.	4,405	4,246	4,039	3,959	3,886
Commercial	Non-residential domestic service	2,920	2,986	3,028	3,150	3,265
Industrial	Businesses whose discharge to the wastewater system have high concentrations of BOD, TSS and /or ammonia.	809	850	880	928	975
Landscape	Water only account	5,888	5,967	5,248	5,541	5,467
Agricultural Irrigation	Irrigation of commercially grown crops or other dedicated agricultural connections.	1,889	1,888	1,895	1,895	1,895
Losses		1,953	2,053	2,097	2,109	2,131
	TOTAL	31,328	31,215	29,913	30,130	30,037
NOTES: Projections based on 2020 target and percentage of sector use in 2015. Governmental sector use from January 2015 was divided evenly between commercial and irrigation sectors.						

DWR Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water	23,613	31,328	31,215	29,913	30,130	30,037
Recycled Water Demand	104	400	1,700	2,900	3,060	3,500
TOTAL WATER DEMAND	**23,717**	**31,728**	**32,915**	**32,813**	**33,190**	**33,537**

NOTES: Demands met by advanced treated water are included here as Potable and Raw Water demands. Non-potable recycled water demands are included here as Recycled Water Demand. DWR has directed agencies to include IPR in both Potable Demands and Recycled Water Demands and Supplies. For this reason, the corresponding DWR tables in Appendix B counts the City's potable reuse in both Potable Water and Recycled Water Demands in this table. The City has elected to only count this water once in the table in the body of this plan to provide a clear understanding to the reader of the total volume of water that is projected for end uses (including loss).

DWR Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
07/2014	1,316
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: The City has elected to use estimated water losses in its 2015 demand tables for calendar year 2015. This was estimated as the difference between production and water use, based on billing data for calendar year 2015. Calendar year 2015 water losses were estimated at 1,955 AF.	

DWR Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook)	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found.	Section 4.2.5; Section 6.8.3; Section 8
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

DWR Table 5-1 Baselines and Targets Summary					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	1999	2008	171	154	137
5 Year	2004	2008	172		
All values are in Gallons per Capita per Day (GPCD)					
NOTES:					

DWR Table 5-2: 2015 Compliance					
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments to 2015 GPCD		2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		TOTAL Adjustments	Adjusted 2015 GPCD		
116	154	0	116	116	Yes
**All values are in Gallons per Capita per Day (GPCD)*					
NOTES: The City was within its 2015 Interim Target prior to adjustments made for extraordinary events, economic adjustments, or weather normalization. No adjustments were made.					

DWR Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Mission Basin	4,522	3,371	4,575	4,735	3,213
	TOTAL	**4,522**	**3,371**	**4,575**	**4,735**	**3,213**
NOTES:						

DWR Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
City of Ocenaside	Metered	9,750	City of Oceanside	San Luis Rey WWTP	Yes	No
City of Ocenaside	Metered	3,225	City of Oceanside	La Salina WWTP	Yes	No
USMC Camp Pendleton	Metered	2,216	USMC Camp Pendleton	SRTTP	No	Yes
Total Wastewater Collected from Service Area in 2015:		15,191				
NOTES: Volumes were monitored in million gallons and converted into acre-feet for purposes of this 2015 Plan.						

DWR Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
San Luis Rey WWTP	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	Yes	Secondary, Undisinfected	9,751	3,224		
San Luis Rey WWTP	City of Oceanside	Recycled Water Customers		Other	Yes	Tertiary			264	
La Salina WWTP	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	No	Secondary, Undisinfected	9,427	2,845		
FPUD Plant No. 1	Oceanside Ocean Outfall	Ocean Outfall		Ocean outfall	Yes	Tertiary	1,588	1,004		584
Camp Pendleton SRTTP	Oceanside Ocean	Ocean Outfall		Ocean outfall	Yes	Tertiary	2,216			
						Total	22,982	7,073	264	584
NOTES:										

DWR Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area									
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:			**City of Oceanside**						
Name of Agency Operating the Recycled Water Distribution System:			**City of Oceanside**						
Supplemental Water Added in 2015			**Not Applicable**						
Source of 2015 Supplemental Water			**Not Applicable**						
Beneficial Use Type		General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040
Agricultural irrigation									
Landscape irrigation (excludes golf courses)		Irrigation of landscape for municipal, commercial, and governmental sectors.	Tertiary	104	400	1,700	2,900	3,060	3,500
Golf course irrigation									
Commercial use									
Industrial use									
Geothermal and other energy production									
Seawater intrusion barrier									
Recreational impoundment									
Wetlands or wildlife habitat									
Groundwater recharge (IPR)									
Surface water augmentation (IPR)									
Direct potable reuse									
Other	Type of Use								
			Total:	104	400	1,700	2,900	3,060	3,500
IPR - Indirect Potable Reuse									

NOTES: The City of Oceanside is pursuing IPR via injection of advanced treated water into the Mission Basin, and extracting it for potable use. This advanced treated water is not reported in this table for consistency between auto-calculated supplies and demands in the DWR tables and actual projected supplies and demands. This avoid the appearance of double-counting IPR as both a recycled water demand and a potable demand, and provides clarity for the reader when reviewing these detailed tables against the summary tables also provided in the text. Advanced Treated Water (IPR) will be used in the following volumes for each identified year: 2020 - 3,300 AF, 2025 - 3,300 AF, 2030 - 3,300 AF, 2035 - 3,300 AF, 2040 - 3,300 AF.

DWR Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
☐	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type	2010 Projection for 2015	2015 Actual Use
Agricultural irrigation		
Landscape irrigation (excludes golf courses)	933	104
Golf course irrigation		
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Surface water augmentation (IPR)		
Direct potable reuse		
Other		
Total	933	104
NOTES:		

DWR Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Upper SLRWRF System – Phase 1	Tertiary treatment expansion, operational storage and pump station	2020	-
Upper SLRWRF System – Phase 2	Pipelines, two booster pump stations, storage tank	2025	720
Upper SLRWRF System – Phase 3	Pipelines and pump station	2030	390
Lower SLRWRF System – Phase 1	Tertiary treatment expansion, pipelines, and pump station	2020	60
Lower SLRWRF System – Phase 2	Pipelines, operational storage and pump station	2025	590
Lower SLRWRF System – Phase 3	Tertiary treatment expansion, pipelines, operational storage and pump station	2030	800
Lower SLRWRF System – Phase 4	Tertiary treatment expansion, pipelines, operational storage and pump station	2035	170
Lower SLRWRF System – Phase 5	Pipelines, operational storage and pump station	2040	420
Mandatory Use Ordinance	Municipal Code Sec. 37.144	2014	-
		Total	3,150
NOTES:			

DWR Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
	Y/N	*If Yes, Agency Name*				
Groundwater Desalination	No			2020		1,200
Seawater Desalination	No			2025		5,040
Non-Potable Recycled Water Expansion	No			2015-2040		3,150
Potable Reuse	No			2020-2040		3,360-5,000
NOTES: Seawater Desalination is still undergoing feasibility studies and is not included in projected supplies. It is included here to show the potential supply increase that may be realized should the project move forward in the future.						

Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	Blend of imported water and desalinated seawater purchased from SDCWA	20,400	Raw Water	
Groundwater	Desalted groundwater from MBGPF	3,213	Raw Water	
Recycled Water	Recycled Water produced at San Luis Rey WRF	104	Recycled Water	
	Total	23,717		0
NOTES: Includes SDCWA water treated and served to VID customers in the Fall/Olive Exchange				

DWR Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
		2020		2025		2030		2035		2040	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Purchased or Imported Water		24,728	-	24,215	-	22,913	-	23,130	-	23,037	-
Groundwater	Mission Basin	3,300	10,000	3,700	10,000	3,700	10,000	3,700	10,000	3,700	10,000
Recycled Water	Nonpotable	400	-	1,700	-	2,900	-	3,060	-	3,500	-
Other	Advanced Treated Water (IPR)	3,300	-	3,300	-	3,300	-	3,300	-	3,300	-
Total		31,728	10,000	32,915	10,000	32,813	10,000	33,190	10,000	33,537	10,000

NOTES: Assumes purchased water make up and demands not fulfilled by local supplies. Advanced treated water is IPR that is injected into the Mission Basin and extracted for potable use.

DWR Table 7-1 Retail: Basis of Water Year Data			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		Agency may provide volume only, percent only, or both	
		Volume Available	% of Average Supply
Average Year	1986-2015	-	100%
Single-Dry Year	2014	-	100%
Multiple-Dry Years 1st Year	2013	-	100%
Multiple-Dry Years 2nd Year	2014	-	100%
Multiple-Dry Years 3rd Year	2015	-	93%-100%
NOTES: The City as selected base years that aligned with SDCWA's 2015 UWMP supply reliability assessment. The third year of a multiple-dry year scenario may result in deficits that must be met through extraordinary conservation or further expansion of the recycled water system. In years with supply reliability, additional purchases would be made from SDCWA to meet demands. As presented here, "% of Average Supply" indicates percent supply available to meet potable demands due to diversification and/or carryover storage.			

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals *(autofill from Table 6-9)*	31,728	32,915	32,813	33,190	33,537
Demand totals *(autofill from Table 4-3)*	31,728	32,915	32,813	33,190	33,537
Difference	(0)	0	0	(0)	0
NOTES:					

DWR Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals	33,886	35,153	35,044	35,447	35,818
Demand totals	33,886	35,153	35,044	35,447	35,818
Difference	0	0	0	0	0
NOTES:					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals	33,759	35,022	34,913	35,314	35,683
	Demand totals	33,759	35,022	34,913	35,314	35,683
	Difference	0	0	0	0	0
Second year	Supply totals	35,282	36,601	36,488	36,907	37,293
	Demand totals	35,282	36,601	36,488	36,907	37,293
	Difference	0	0	0	0	0
Third year	Supply totals	36,868	38,247	38,129	37,446	36,459
	Demand totals	36,868	38,247	38,129	37,446	36,459
	Difference	0	0	0	0	0
NOTES:						

Table 8-1 Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction[1]	Water Supply Condition
1	up to 10%	Drought Watch Condition
2	up to 20%	Drought Alert Condition
3	up to 40%	Drought Critical Condition
4	above 40%	Drought Emergency Condition
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: Level 4 includes provisions to establish water budgets or allocations as necessary, and addresses water shortages of 50%.		

Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other - Prohibit use of potable water for washing hard surfaces		No
1	Landscape - Restrict or prohibit runoff from landscape irrigation		No
1	Landscape - Limit landscape irrigation to specific times	Irrigation must take place before 10 a.m. or after 6 p.m.	No
1	Other - Require automatic shut of hoses		No
1	CII - Other CII restriction or prohibition	Limit landscape irrigation to specific times for nursery or commercial growers	No
1	Water Features - Restrict water use for decorative water features, such as fountains	With the exception of features that use re-circulated water	No
1	CII - Restaurants may only serve water upon request		No
1	CII - Lodging establishment must offer opt out of linen service		No
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks must be repaired within 5 days	No
1	Other	Non-potable water must be used for construction purposed when available	No
2	Landscape - Limit landscape irrigation to specific days	Limited to two assigned days per week	Yes
2	Landscape - Other landscape restriction or prohibition	Limit irrigation using sprinklers to no more than 10 minutes per day	Yes
2	Landscape - Other landscape restriction or prohibition	Stop irrigation with potable water of ornamental turf on public street medians	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks must be repaired immediately	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	With the exception of features that use re-circulated water	Yes
2	Landscape - Other landscape restriction or prohibition	Stop all watering during and 48 hours following measurable precipitation	Yes
2	Other	Stop irrigation with potable water outside newly constructed homes and buildings	Yes

3	Landscape - Limit landscape irrigation to specific days	Residential and commercial landscape irrigation limited to two assigned days per week from June - October and one day per week from November - May	Yes
3	Other water feature or swimming pool restriction	Stop filling or re-filling ornamental lakes or ponds except to the extent needed to sustain aquatic life	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
4	Landscape - Prohibit all landscape irrigation	With the exception of crops and landscape products of commercial growers and nurseries or other listed exceptions	Yes
NOTES:			

Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference
1	Expand Public Information Campaign	
1	Provide Rebates on Plumbing Fixtures and Devices	
1	Provide Rebates for Landscape Irrigation Efficiency	
1	Provide Rebates for Turf Replacement	Only when funds are made available
1	Offer Water Use Surveys	
3	Moratorium or Net Zero Demand Increase on New Connections	
3	Implement or Modify Drought Rate Structure or Surcharge	
3	Other	Water allocations may be established
4	Moratorium or Net Zero Demand Increase on New Connections	
4	Implement or Modify Drought Rate Structure or Surcharge	
4	Other	Water allocations may be established
NOTES:		

Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	25,319	26,921	28,524
NOTES:			

Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Carlsbad	☑	☑
City of Escondido	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
San Diego County	☑	☑
NOTES:		

SB X7-7 Table 0: Units of Measure Used in UWMP*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	30,927	Acre Feet
	2008 total volume of delivered recycled water	66	Acre Feet
	2008 recycled water as a percent of total deliveries	0.21%	Percent
	Number of years in baseline period[1]	10	Years
	Year beginning baseline period range	1999	
	Year ending baseline period range[2]	2008	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[3]	2008	
[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.			
[2] The ending year must be between December 31, 2004 and December 31, 2010.			
[3] The ending year must be between December 31, 2007 and December 31, 2010.			
NOTES:			

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1999	158,451
Year 2	2000	161,624
Year 3	2001	162,907
Year 4	2002	164,312
Year 5	2003	165,962
Year 6	2004	166,859
Year 7	2005	166,958
Year 8	2006	165,539
Year 9	2007	165,545
Year 10	2008	166,064
5 Year Baseline Population		
Year 1	2004	166,859
Year 2	2005	166,958
Year 3	2006	165,539
Year 4	2007	165,545
Year 5	2008	166,064
2015 Compliance Year Population		
2015		171,183
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *								
	Baseline Year	**Volume Into Distribution System**	**Deductions**					**Annual Gross Water Use**
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water	Water Delivered for Agricultural Use	Process Water	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1999	33,254			0	2,330	0	30,924
Year 2	2000	33,862			0	2,719	0	31,142
Year 3	2001	32,141			0	2,369	0	29,772
Year 4	2002	35,467			0	3,255	0	32,211
Year 5	2003	32,844			0	2,480	0	30,364
Year 6	2004	35,169			0	2,408	0	32,760
Year 7	2005	33,611			0	2,221	0	31,391
Year 8	2006	34,311			0	2,530	0	31,781
Year 9	2007	35,585			0	2,701	0	32,884
Year 10	2008	33,050			0	1,795	0	31,255
10 - 15 year baseline average gross water use								**31,448**
5 Year Baseline - Gross Water Use								
Year 1	2004	35,169			0	2,408	0	32,760
Year 2	2005	33,611			0	2,221	0	31,391
Year 3	2006	34,311			0	2,530	0	31,781
Year 4	2007	35,585			0	2,701	0	32,884
Year 5	2008	33,050			0	1,795	0	31,255
5 year baseline average gross water use								**32,014**
2015 Compliance Year - Gross Water Use								
2015		23,613			0	1,345	0	22,268

NOTES: In order to not artificially lower gross water use, recycled water was not reported here. The Water Code Section 10608.12(g) defines "Gross Water Use" as the total volume of water, whether treated or untreated, entering the water distribution system of an urban retail water supplier, excluding recycled water, the net volume of water that is placed into long-term storage, the volume of water that is conveyed for use by another water supplier, and the volume of water delivered for agricultural use.

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)				
Name of Source	Wells			
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1999	2,769		2,769
Year 2	2000	2,421		2,421
Year 3	2001	2,077		2,077
Year 4	2002	2,463		2,463
Year 5	2003	3,085		3,085
Year 6	2004	2,684		2,684
Year 7	2005	2,304		2,304
Year 8	2006	2,126		2,126
Year 9	2007	2,219		2,219
Year 10	2008	1,677		1,677
5 Year Baseline - Water into Distribution System				
Year 1	2004	2,684		2,684
Year 2	2005	2,304		2,304
Year 3	2006	2,126		2,126
Year 4	2007	2,219		2,219
Year 5	2008	1,677		1,677
2015 Compliance Year - Water into Distribution System				
2015		3,213		3,213
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)				
Name of Source	SDCWA			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1999	30,485		30,485
Year 2	2000	31,441		31,441
Year 3	2001	30,064		30,064
Year 4	2002	33,004		33,004
Year 5	2003	29,759		29,759
Year 6	2004	32,484		32,484
Year 7	2005	31,307		31,307
Year 8	2006	32,185		32,185
Year 9	2007	33,366		33,366
Year 10	2008	31,373		31,373
5 Year Baseline - Water into Distribution System				
Year 1	2004	32,484		32,484
Year 2	2005	31,307		31,307
Year 3	2006	32,185		32,185
Year 4	2007	33,366		33,366
Year 5	2008	31,373		31,373
2015 Compliance Year - Water into Distribution System				
2015		20,400		20,400
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year		Service Area Population	Annual Gross Water Use	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1999	158,451	30,924	174
Year 2	2000	161,624	31,142	172
Year 3	2001	162,907	29,772	163
Year 4	2002	164,312	32,211	175
Year 5	2003	165,962	30,364	163
Year 6	2004	166,859	32,760	175
Year 7	2005	166,958	31,391	168
Year 8	2006	165,539	31,781	171
Year 9	2007	165,545	32,884	177
Year 10	2008	166,064	31,255	168
10-15 Year Average Baseline GPCD				**171**
5 Year Baseline GPCD				
Baseline Year		Service Area Population	Gross Water Use	Daily Per Capita Water Use
Year 1	2004	166,859	32,760	175
Year 2	2005	166,958	31,391	168
Year 3	2006	165,539	31,781	171
Year 4	2007	165,545	32,884	177
Year 5	2008	166,064	31,255	168
5 Year Average Baseline GPCD				**172**
2015 Compliance Year GPCD				
2015		171,183	22,268	116
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day	
10-15 Year Baseline GPCD	171
5 Year Baseline GPCD	172
2015 Compliance Year GPCD	116
NOTES:	

SB X7-7 Table 7: 2020 Target Method		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
171	137
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD	Maximum 2020 Target*	Calculated 2020 Target	Confirmed 2020 Target
172	163	137	137
** Maximum 2020 Target is 95% of the 5 Year Baseline GPCD*			
NOTES:			

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target	10-15 year Baseline GPCD	2015 Interim Target GPCD
137	171	154
NOTES:		

SB X7-7 Table 9: 2015 Compliance					
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)*		2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015?
		TOTAL Adjustments	Adjusted 2015 GPCD		
116	154	0	116	116	YES
NOTES:					

Appendix C - Climate Change Vulnerability Analysis

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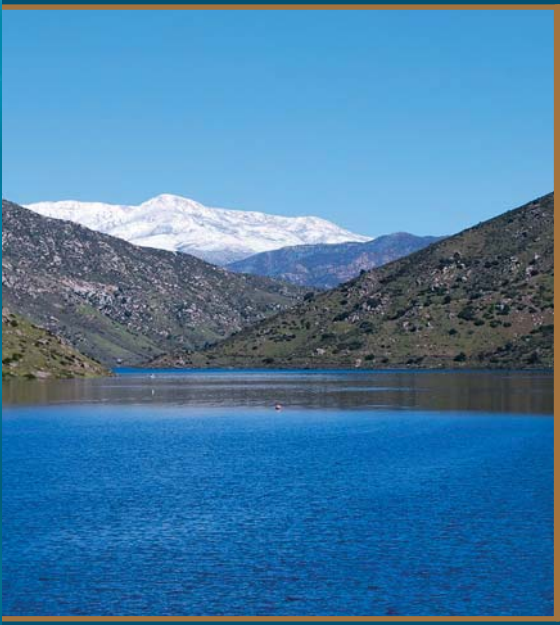
Appendix 7-D:
San Diego IRWM Climate Change Study




SAN DIEGO Integrated Regional Water Management

Climate Change Planning Study

Final

Prepared by:

RMC Water and Environment

May 2013

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Acknowledgements

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Tim Bombardier, San Diego County Water Authority

Donna Chralowicz, City of San Diego

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Cheryl Laskowski, AECOM

Peter Livingston, County of San Diego

Anna Lowe, County of San Diego

Fiona Lyons, San Diego County Water Authority

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List of Abbreviations

AB	Assembly Bill
AF	Acre-foot
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CAT	Climate Action Team
CCAR	California Climate Action Registry
CCAS	California Climate Action Strategy
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CNRA	California Natural Resources Agency
CO_2	Carbon Dioxide
DWR	Department of Water Resources
EO	Executive Order
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
HFCs	Hydrofluorocarbons
IRWM	Integrated Regional Water Management
kWh	kilowatt hours
$MMTCO_2E$	Million metric tons carbon dioxide equivalent
MSHCP	Multiple Species Habitat Conservation Plan
N_2O	Nitrous Oxide
NF_3	Nitrogen Trifluoride
OPC	Ocean Protection Council
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
RMS	Resource Management Strategy
SB	Senate Bill
SDCWA	San Diego County Water Authority

SDG&E	San Diego Gas & Electric
SDRIP	San Diego River Improvement Project
SF_6	Sulfur Hexafluoride
SLR	Sea Level Rise
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCR	The California Registry
TMDL	Total Maximum Daily Load
TDS	Total Dissolved Solids
USEPA	United States Environmental Protection Agency
WET-CAT	Water Energy Team of the Climate Action Team

1 Climate Change in Water Resources

This chapter addresses requirements set forth in the Resource Management Strategies (RMS) Standard in the *2012 IRWM Program Guidelines* (DWR 2012). As such, this chapter considers each RMS listed in the *California Water Plan (CWP) Update 2009* (DWR 2009), documents which RMS will help achieve the IRWM Plan Update objectives, presents all RMS considered for the IRWM Plan Update, and includes an evaluation of the adaptability of water management systems in the San Diego IRWM Region to climate change.

1.1 Introduction

Climate change projections have shown that California can expect to be impacted by changes to temperature and precipitation in the future, and even now California is beginning to experience the effects of these impacts. Water resource planners already face challenges interpreting new climate change information and discerning which response methods and approaches will be most appropriate for their planning needs. This Climate Change Planning Study (Study) examines current climate change science, policies, and regulations in terms of how they affect the San Diego Integrated Regional Water Management Region (Region). This Study serves as an initial guide for the Region to begin incorporating climate change adaptation and mitigation measures into its Integrated Regional Water Management (IRWM) Plan, where adaptation is how the Region can respond to climate change effects and mitigation is how the Region can reduce future climate change effects, and includes the following sections:

- Chapter 1: Climate Change in Water Resources
- Chapter 2: Climate Change in IRWM Planning
- Chapter 3: Effects of Climate Change on the Region
- Chapter 4: Vulnerability Analysis
- Chapter 5: Climate Change Management Strategies
- Chapter 6: Recommendations

1.2 Adaptation Relationship

Climate change is expected to directly impact a number of areas related to water resources, in particular temperature, precipitation, and sea level rise. As global temperature increases, seasonal precipitation patterns including the timing, intensity and form of precipitation, are projected to continue to change. Sea level rise, which has risen about seven inches over the last century due to warming, is expected to rise further in the future. In order for the Region to adapt to, or protect against, climate change, it must first identify the impacts climate change is expected to have on the Region.

These impacts are expected to further impact local water resources as follows (DWR, 2011):

- Temperature increases:
    - More winter precipitation falling as rain rather than snow, leading to reduced snowpack water storage, reduced long term soil humidity, reduced groundwater and downstream flows, and reduced imported water deliveries

    - Higher irrigation demands as temperatures alter evapotranspiration rates, and growing seasons become longer
    - Exacerbated water quality issues associated with dissolved oxygen levels, increased algal blooms and increased concentrations of salinity and other constituents
    - Impacted habitats for temperature-sensitive fish and other life forms, and increased susceptibility of aquatic habitats to eutrophication
- Precipitation pattern changes:
    - Increased flooding (both coastal and inland) caused by more intense storms
    - Changes to growth and life cycle patterns caused by shifting weather patterns
    - Threats to soil permeability, adding to increased flood threat and decreased water availability
    - Reduced water supply caused by the inability to capture precipitation from more intense storms, and a projected progressive reduction in average annual runoff (though some models suggest that there may be some offset from tropical moisture patterns increasingly moving northward)
    - Increased turbidity caused by more extreme storm events, leading to increased water treatment needs and impacts to habitat
    - Increased wildfires with less frequent, but more intense rainfall, and possibly differently timed rainfall through the year, potentially resulting in vegetation cover changes
    - Reduction in hydropower generation potential
- Sea level rise:
    - Inundation and erosion of coastal areas (coastal bluffs in particular), including coastal infrastructure
    - Saline intrusion of coastal aquifers
    - Increased risk of storm surges and coastal flooding and erosion during and after storms
    - Changes in near-shore protective biogeography such as loss of sand, tide pools and kelp beds

Although the extent of these changes is uncertain, scientists agree that some level of change is inevitable; therefore, it will be necessary to implement flexible adaptation measures that will allow natural and human systems to respond to these climate change impacts in timely and effective ways. Adaptation measures may be implemented in response to climate change impacts that have already occurred, or expected impacts that are projected to occur. It is important to take note that water resources decisions made in the future will impact the rate of climate change.

In addition to adapting to climate change, the Region has the opportunity to mitigate against climate change by minimizing greenhouse gas emissions emitted by water supply and wastewater activities. The relationship between water resources and greenhouse gas emissions is discussed further in the next section.

1.3 Water-Energy Nexus

To understand how water is related to climate change, it's helpful to understand the connection between water resources planning and energy, which is known as the water-energy nexus. Energy production accounts for between 30% and 40% of total GHG production in California, and can emit a number of different types of GHGs. California's Air Resources Board recognizes and inventories the following GHGs: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF3). These GHGs vary in magnitude in terms of their GHG strength, and therefore are converted to be equivalent to CO2 for the purposes of measuring GHG emissions across the state. CO2 emissions (or the equivalent for other GHGs) are the common measurement for GHG emissions. (CARB, 2013). Currently, statewide water use accounts for nearly 20% of electricity use, and 30% of non-power plant related natural gas consumption (CEC, 2006). Water use and energy are linked in at least three critical ways (CEC, 2011):

1. Water pumping and purification: The amount of energy used to pump water will depend upon the source (e.g., surface versus groundwater), the distance and height the water must be moved, and the treatment requirements. For example, pumping water to San Diego County through the State Water Project, which accounts for nearly 80% of the County's water supply, uses about 4,600 kilowatt hours (kWh) per acre-foot of electricity (DWR, 2012a), while groundwater pumping typically uses 300 kWh/AF (Cohen, 2007).
2. Wastewater treatment: The amount of energy used in wastewater treatment plant typically ranges from 1,100 to 4,600 kWh per million gallons of wastewater treated (CEC, 2006).
3. Water heating: In an average California home, 41 percent of the water is used for dishwashing, faucets, laundry, and bathing water that is often heated.

These amounts, in total, are so significant that we must also count the amount of GHGs from the fossil fuels that are burned to produce the oil, gas, coal and other combustibles which are then burned to produce the electricity. Understanding the water-energy nexus in California provides opportunities to attain significant energy benefits through two primary strategies (CEC, 2006):

1. Conserving water saves the energy that would have been used to convey, treat, and distribute the water, and energy that may have been needed to collect, treat and dispose of the wastewater.
2. Reducing the energy intensity of water operations reduces the total amount of energy consumed in the water sector and ultimately reduces the value of energy embedded in saved water.

By reducing the energy used through the above strategies, GHG production can be reduced.

It should be noted that, at times, the above processes may also be used to generate energy, such as through cogeneration at wastewater treatment plants, or capturing energy as water flows downhill. Concurrently, energy production processes require water for steam production for thermoelectric power and to cool equipment by absorbing waste heat. Energy conservation in the Region can reduce this need.

These strategies are reflected in California's legislation and policy regarding climate change mitigation and greenhouse (GHG) emissions reduction discussed in the remainder of Chapter 1.

1.4 Legislative and Policy Context

In order to address currently-projected climate change impacts to California's water resources, the Department of Water Resources' (DWR's) 2012 IRWM Grant Program Guidelines require that IRWM Plans describe and consider climate change adaptation and mitigation. Below is a summary of State legislation and policy that were considered as part of this IRWM Plan.

Executive Order S-3-05

Executive Order (EO) S-3-05, signed on June 1, 2005 by Governor Arnold Schwarzenegger, is one of the key pieces of legislation that has laid the foundation for California's climate change policy. This piece of legislation recognizes California's vulnerabilities to the impacts of climate change, which include its water-related natural resources. EO S-3-05 established three GHG reduction targets for California:

- By 2010, reduce GHG emissions to 2000 California levels
- By 2020, reduce GHG emissions to 1990 California levels
- By 2050, reduce GHG emissions to 80 percent below 1990 California levels

In addition to establishing GHG reduction targets for California, EO S-3-05 dictates that the Secretary of the California Environmental Protection Agency (CalEPA) establish the Climate Action Team (CAT) for State agencies to coordinate oversight of efforts to meet these targets. As laid out in EO S-3-05, the CAT submits biannual reports to the governor and State legislature describing progress made toward reaching the targets.

There are currently 12 sub-groups within the CAT, one of which is the Water-Energy group (also known as WET-CAT). WET-CAT was tasked with coordinating the study of GHG effects on California's water supply system, including the development of GHG mitigation strategies for energy consumption related to water use. Since the adoption of the Assembly Bill 32 Scoping Plan (see the following section), WET-CAT has been working on the implementation and analyses of six water-related measures identified in the Scoping Plan:

- Water Use Efficiency
- Water Recycling
- Water System Energy Efficiency
- Reuse Urban Runoff
- Increase Renewable Energy Production
- Public Goods Charge for Water

Assembly Bill 32: The California Global Warming Solutions Act of 2006

Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006 was signed by Governor Schwarzenegger to codify the mid-term GHG reduction target established in EO S-3-05 (reduce GHG emissions to 1990 levels by 2020) through, among other mechanisms, imposing an enforceable cap on GHG emissions. AB 32 directed the California Air Resources Board (CARB) to develop discrete early actions to reduce GHG emissions by 2007, and to adopt regulations to implement early action measures by January 1, 2010.

Climate Change Scoping Plan

AB 32 also required CARB to prepare a Scoping Plan to identify and achieve reductions in GHG emissions in California. The approved Climate Change Scoping Plan, adopted by CARB in December 2008, recommends specific strategies for different business sectors, including water management, to achieve the 2020 GHG emissions limit. The Scoping Plan as it relates to water resources is discussed further in Section 0 below.

Senate Bill 97

Senate Bill 97 (SB 97) directed the Governor's Office of Planning and Research (OPR) to develop amendments to the California Environmental Quality Act (CEQA) Guidelines to determine how climate change is analyzed in documents required by CEQA. On December 31, 2009, the California Natural Resources Agency adopted amendments to the CEQA Guidelines and sent them to the California Office of Administrative Law for approval and filing with the Secretary of State. These CEQA Guideline amendments became effective on March 18, 2010. The CEQA Guidelines are not prescriptive; rather they encourage lead agencies to consider many factors in performing a CEQA analysis, and maintain discretion with lead agencies to make their own determinations based on substantial evidence.

Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water

DWR, in collaboration with the State Water Resources Control Board, other state agencies, and numerous stakeholders, has initiated a number of projects to begin climate change adaptation planning for the water sector. In October 2009, DWR released the first state-level climate change adaptation strategy for water resources in the U.S., and the first adaptation strategy for any sector in California. Entitled Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water, the report details how climate change is currently affecting the state's water supplies, and sets forth ten adaptation strategies to help avoid or reduce climate change impacts to water resources.

Central to these adaptation efforts will be the full implementation of IRWM plans, which address regionally-appropriate management practices that incorporate climate change adaptation. These plans will evaluate and provide a comprehensive, economical, and sustainable water use strategy at the watershed level for California.

Executive Order S-13-08

Given the potentially serious threat of sea level rise to California's water supply and coastal resources, and the subsequent impact it would have on our state's economy, population, and natural resources, Governor Schwarzenegger issued EO S-13-08 to enhance the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation, and extreme weather events. It requested a California Sea Level Rise Assessment Report to be conducted by the National Academy of Sciences, which was released in June 2012.

California Climate Adaptation Strategy

In response to the passage of EO S-13-08, the California Natural Resources Agency released the report entitled 2009 California Climate Adaptation Strategy that summarizes the best known science on climate change impacts in the state, assesses vulnerabilities, and outlines possible solutions that can be implemented within and across the state agencies to promote resilience to climate change.

GHG Reporting Rule

While California has taken the lead in climate change policy and legislation, there have been several recent important developments at the federal level. On September 22, 2009, the United States Environmental Protection Agency (USEPA) released its final GHG Reporting Rule (Reporting Rule). Starting in 2010, facility owners that emit 25,000 metric tons of CO2 emissions or more per year are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. These activities will dovetail with the AB 32 reporting requirements in California.

Water Code Section 10541

California has included climate change in its water code to ensure that it is considered as part of water management. California Water Code Section 10541 contains requirements for considering climate change in IRWM Plans. Specifically, it states that the guidelines for IRWM Plans are required to include:

- Consideration of GHG emissions of identified programs and projects
- Evaluation of the adaptability to climate change of water management systems in the region

1.5 AB 32 Scoping Plan and CARB Strategies

As stated previously, AB 32 required CARB to prepare a Scoping Plan to identify and achieve reductions in GHG emissions in California, and recommended specific strategies for different business sectors to achieve the 2020 GHG emissions limit. This Scoping Plan was introduced in 2005, and adopted in 2008. Water use is identified in the AB 32 Scoping Plan as a sector requiring significant amounts of energy, and sets a goal to "continue efficiency programs and use cleaner energy sources to move and treat water." This goal recognizes that California has a history of advancing water efficiency and conservation programs.

The Scoping Plan identifies six greenhouse gas emissions reduction (mitigation) measures for the water sector that could reduce GHGs if implemented statewide (please note that not all of these measures may be applicable to the San Diego IRWM Region):

1. Water Use Efficiency: Through increases in water use efficiency measures, reduce total statewide emissions
2. Water Recycling: Through increases in water recycling, reduce total statewide emissions
3. Water system energy efficiency: Through increases in water system energy efficiency, reduce total statewide emissions
4. Reuse of urban runoff: Through reuse of urban runoff, reduce total statewide emissions
5. Increase renewable energy production: Through the increase in renewable energy production, reduce statewide emissions
6. Public goods charge: To be determined

The first three of the measures will reduce energy requirements associated with providing reliable water supplies. The next two measures will reduce the amount of non-renewable electricity associated with conveying and treating water. The final measure (public goods charge) focuses on providing sustainable funding for implementing these actions. Other sectors identified in the Scoping Plan, such as Agriculture and Green Building, recognize that water use efficiency measures

will help to decrease GHG emissions as well, but do not calculate water use efficiency savings separately. The Scoping Plan states that to implement these GHG reduction measures, CARB and other State agencies will work with stakeholders and the public to develop regulatory measures and other programs.

1.6 California Climate Action Registry/The Climate Registry

The California Climate Action Registry (CCAR) was a program of the Climate Action Reserve which closed in December 2010. It served as a voluntary GHG registry to promote early actions to reduce GHG emissions by organizations. CCAR members voluntarily measured, verified, and publicly reported their GHG emissions. Members of the CCAR have been transitioned over to The Climate Registry (TCR), which is a nonprofit GHG emissions registry for North America that provides organizations with the tools to help them calculate, verify, report and manage their GHG emissions within a single registry. A number of agencies and organizations in the IRWM Region are voluntary members of TCR, including:

- San Diego County Water Authority
- City of San Diego
- County of San Diego
- Metropolitan Water District of Southern California

TCR's tools and database are particularly useful to those entities required to report their GHG emissions according to the EPA's Greenhouse Gas Reporting Rule (74 FR 56260) which requires reporting of GHG data and other relevant information from large sources and suppliers in the United States, and went into effect in January 2010. Though primarily affecting facilities that supply fossil fuels or industrial GHGs, manufacturers of vehicles and engines, this rule also applies to facilities that are responsible for the emission of 25,000 metric tons or more of GHG emissions per year, and therefore may apply to water and wastewater utilities, and large water purchasers. In addition to meeting USEPA requirements, by becoming a member of TCR, a utility, agency or company may better be able to respond to California's requirements for reporting and reducing GHG emissions.

1.7 Climate Action Plans and Climate Initiatives

Climate action plans are becoming more common among California's cities and counties. A climate action plan, which may also be referred to as a climate mitigation and adaptation plan, is a set of strategies intended to guide efforts for reducing GHG emissions, and typically covers a range of sectors such as energy, transportation, water, wastewater, solid waste, infrastructure, urban forestry and agriculture, and public health. Plans may also include strategies to guide efforts for reducing the impact of climate change effects on the area. Within the Region, the County and a number of cities and agencies have developed or are developing climate action plans and adaptation plans:

- County of San Diego Climate Action Plan
- San Diego County Water Authority Climate Action Plan and Climate Mitigation Plan
- City of San Diego Climate Mitigation and Adaptation Plan

- City of San Diego Long Range Water Resources Plan
- City of Chula Vista Adaptation and Mitigation Plan
- City of Encinitas Climate Action Plan
- City of Escondido Climate Action Plan
- City of San Marcos Climate Action Plan
- Port of San Diego Climate Mitigation and Adaptation Plan
- San Diego Association of Governments (SANDAG) Regional Energy Strategy and Climate Action Strategy
- San Diego Bay Sea Level Rise Adaptation Study
- San Diego Foundation Focus 2050 Study

In addition to the Climate Action Plans developed in the Region, the San Diego Foundation has developed a Climate Initiative to support community awareness about the local impacts of climate change. This initiative aims to educate the community about climate change, support climate change research, partner with local governments to address climate change, and provide technical assistance for climate action planning. As part of this initiative, every jurisdiction in the County has completed a GHG emissions inventory.

2 Climate Change in IRWM Planning

2.1 DWR Requirements

As previously discussed, the California Water Code contain language stating that IRWM Plan guidelines require climate change be considered as part of IRWM Plans. In line with this, DWR has included a Climate Change Standard in the IRWM Guidelines that requires IRWM plans to include a "cursory analysis of the effects on the region due to climate change, with the intent that a more refined analysis be required as additional guidance is made available." To meet these guidelines, DWR has suggested that climate change be included in IRWM Plans as shown in Table 1.

Table 1: IRWM Plan Standards in Relation to Climate Change

Plan Section According to IRWM Plan Standards	Climate Change Information to Include[1]
Region Description	Language that describes likely climate change impacts on the Region as determined from a vulnerability assessment
Plan Objectives	Adaptation to climate change: • Address adapting to changes in the amount, intensity, timing, quality and variability precipitation, runoff and recharge. • Consider sea level rise effects on water supply and other water resource conditions (e.g., recreation, habitat) and identify suitable adaptation measures. Consider OPC's Sea Level Rise Policy Reducing emissions (mitigation of greenhouse gasses) • Reduce carbon consumption, especially the energy embedded in water use, and ultimately reduce GHG emissions • Consider the strategies adopted by CARB in its AB 32 Scoping Plan, including innovative applications • Consider options for carbon sequestration where such options are integrally(directly or indirectly) tied to supporting IRWM Plan objectives
Resource Management Strategies	Identify and implement adaptation strategies that address region-specific or local climate change contributions or impacts
Project Review Process	Include the following factors: • Contribution of the project to adapting to climate change • Contribution of the project in reducing GHG emissions as compared to project alternatives
Relation to Local Water Planning	Consider and incorporate water management issues and climate change adaptation and mitigation strategies from local plans into the IRWM Plan.
Relation to Local Land Use Planning	Demonstrate information sharing and collaboration with regional land use planning in order to management multiple water demands through the state (as described in CWP Update 2009), adapt water management systems to climate change, and potentially offset climate change impacts to water supply.
Plan Performance and Monitoring	Contain policies and procedures that promote adaptive management.
Coordination	Consider the following: • Stay involved in CNRA's California Adaptation Strategy process • Consider joining The California Registry (www.theclimateregistry.org)

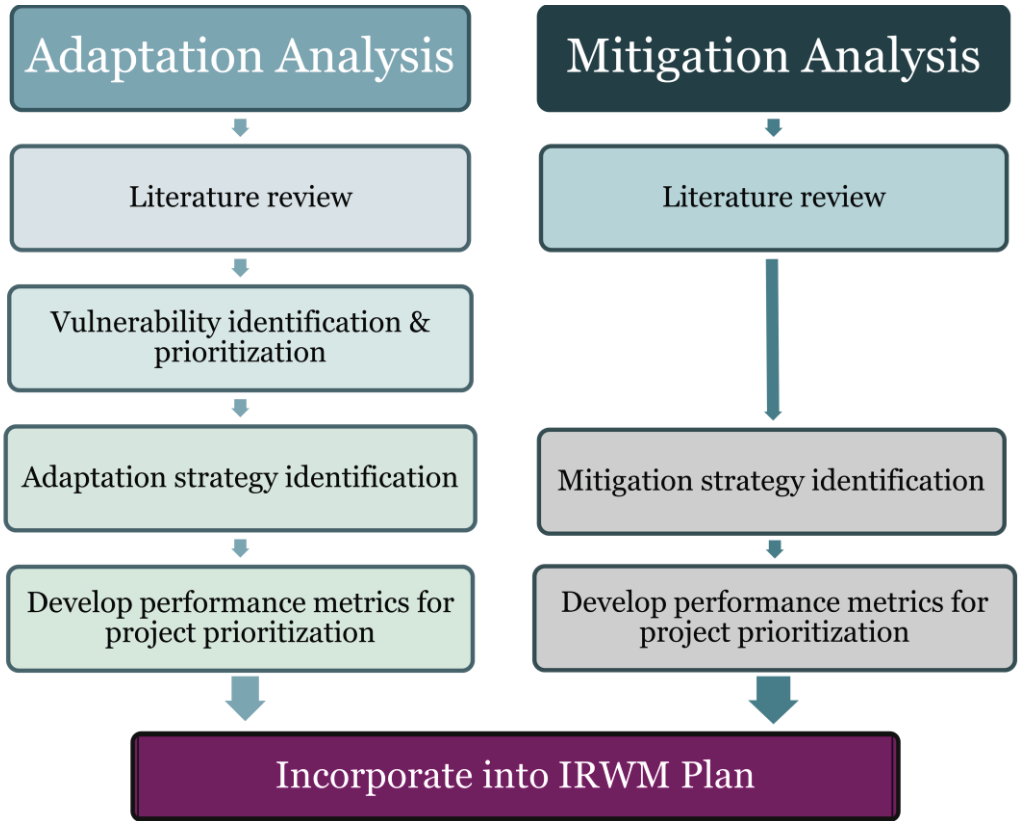
1. Based on information in DWR's 2012 Prop 84 and Prop 1E IRWM Guidelines, Appendix C, Table 7

2.2 Adaptation and Mitigation Analysis

In order to meet the IRWM Plan standards discussed in the previous section, the climate change analysis process shown in Figure 1 was followed. As previously discussed in this Study, climate change includes both adaptation (responding to climate change) and mitigation (reducing GHGs), and therefore is reflected in the analysis process below. While both the adaptation analysis and mitigation analysis include a literature review, strategy identification and performance metrics

development, the adaptation analysis includes an extra step to identify and prioritize climate change vulnerabilities. The information gathered through this climate change analysis will be incorporated into the Region's IRWM Plan update. By working through each of these steps, the Region can meet the requirements contained in DWR's IRWM Plan Guidelines.

Figure 1: Climate Change Analysis Process



2.3 San Diego IRWM Region Climate Change Study

To fulfill DWR's requirements and work through the climate change analysis discussed above, the Region established a Climate Change Workgroup (Workgroup) comprised of various water resources and planning representatives that have experience in climate change planning within the Region to work with a consultant to develop this Climate Change Planning Study (Study). In addition, local climate change efforts, in particular the San Diego Foundation Regional Focus 2050 Study which defines Region-specific climate change impacts, were used in the climate change assessment.

3 Effects of Climate Change on Region

3.1 Impacts and Effects on Region

Estimating the impacts of climate change at a regional level is challenging due to the coarse spatial scale of models that project climate change impacts of temperature and rainfall, and due to the long time scale evaluated in many models (to the year 2100). Recently, state and local entities have been working to downscale climate models to allow for climate change planning at a level that can be useful for planning efforts. The timescale used for these models has also been downscaled to provide outputs for the year 2050, and though this is still a longer timescale than is used in IRWM planning, is still useful for assessing climate change.

To incorporate climate change into water resources management, downscaled temperature and precipitation projections are input into other models, such as hydrologic models, to project impacts to water supply, water demand, snow pack, sea level rise, and wildfires. The results of these models have been summarized in a variety of studies and planning documents at the state, regional, and local levels. As part of this Study, a number of these documents were reviewed to determine which best represented the impacts for the Region. These documents include:

- *Regional Focus 2050 Study* (San Diego Foundation, 2008a & 2008b)
- *2010 Urban Water Management Plan* (San Diego County Water Authority, 2011)
- *Using Future Climate Projections to Support Water Resources Decision Making in California,* (California Climate Change Center, 2009)
- *Reconciling Projections of Colorado River Streamflow, Southwest Hydrology* (Hoerling et al., 2009)

Climate change impacts and effects are based on very different climate change assumptions and analysis approaches. Table 2 summarizes the impacts and effects of climate change on the San Diego Region by 2050 (unless otherwise indicated), which are typically based on an average of various climate change analyses. Generally, climate change is expected to increase temperature in the region. Rainfall projections vary with some projections showing that the Region will receive as much as 35% less rainfall and some showing up to 17% more rainfall (San Diego Foundation, 2008a). It's generally accepted that storms will be less frequent, but more intense (San Diego Foundation, 2008a). With higher temperatures and changes in rainfall volume and frequency, additional impacts will be felt in the Region.

Imported water supply from the State Water Project is projected to decrease by up to 25% (California Climate Change Center, 2009), while Colorado River Aqueduct supply may decrease by up to 20% (Hoerling et al, 2009). An overall shortfall of 164,000 acre-feet per year (AFY) in imported water is expected by 2050 (San Diego Foundation, 2008b).

Preliminary analysis of regional water demand trends in the San Diego County Water Authority service area indicate that climate change impacts may result in a slight demand increase, between 0.6 and 1.8%, by the year 2035. (SDCWA, 2011).

In currently accepted models, sea level rise is projected to be at least 12 to 18 inches by 2050, which would both inundate the coast due to the average rise, and impact coastal flood control during storms (San Diego Foundation, 2008a).

The changes to climate are also expected to increase the frequency of wildfires. Studies suggest that there will be a 40% increase in Coastal Sage Scrub acreage burned (San Diego Foundation, 2008a), and that 54% more acreage in the Western U.S. will burn compared to present (San Diego Foundation, 2008a). Increases in wildfires have the potential to increase sedimentation and turbidity of surface waters, and increase flash flooding.

Knowing what climate change impacts and effects are projected to have on the Region, it's possible to determine what water resources in the Region are most vulnerable to climate change. The next sections identify and prioritize the vulnerabilities to determine how to best apply management practices. These effects were presented to and vetted by the Workgroup at a meeting held on June 12, 2012.

Table 2: Impacts and Effects of Climate Change on Region by 2050

Impact	Effect
Temperature	• 1.5°F to 4.5°F average temperature increase
Rainfall	• Variable projections predict between 35% drier and 17% wetter • Increase in variability between years
Supply	• Up to 25% decrease in SWP supply • Up to 20% decrease in Colorado River supply • 164,000 afy average shortfall in imported supply
Demand	• Potential 0.6% to 1.8% increase in demand by 2035
Sea level rise	• 12 to 18 inch rise in mean sea level rise
Wildfires	• 40% increase in California Coastal Shrub acreage burned in Southwestern U.S. • 54% increase in overall acreage burned in Western U.S.

3.2 Identification of Vulnerabilities

Understanding the potential impacts and effects that climate change is projected to have on the Region allows an informed vulnerability assessment to be conducted for the Region's water resources. A climate change vulnerability assessment helps a Region to assess its water resource sensitivity to climate change, prioritize climate change vulnerabilities, and ultimately guides decisions as to what strategies and projects would most effectively adapt to and mitigate against climate change. DWR has identified a series of questions to help regions identify key indicators of potential vulnerability, including (DWR, 2011):

- Currently observable climate change impacts (climate sensitivity)
- Presence of particularly climate sensitive features, such as specific habitats and flood control infrastructure (internal exposure)
- Resiliency of a region's resources (adaptive capacity)

The Workgroup developed an analysis of the Region's vulnerabilities to climate change at the June 12, 2012 climate change workshop by asking a series of questions suggested by DWR in its 2011 *Climate Change Handbook for Regional Water Planning.* Table 3 summarizes the analysis, which includes:

- Vulnerability Question: Taken from Box 4-1 of DWR's *Climate Change Handbook*

- Answer: Provided at June 12, 2012 workshop
- Justification: Why Y (yes) or N (no) was selected
- Vulnerability Issue: What is the climate change vulnerability issue that is identified by asking the question?

Following this analysis, the vulnerability issues were prioritized by the Workgroup. This activity and results are described in Chapter 4.

Table 3: Climate Change Vulnerability Indicator Questions

Vulnerability Question	Answer	Justification	Vulnerability Issue
Water Demand			
Are there major industries that require cooling/process water in your planning region?	Y	Electronics and aerospace manufacturing, energy generation, research development, pharmaceutical. Biotech and energy growing. Room for efficiency improvements	Increase in industrial demand
Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?	Y	Primary crops include avocados, nurseries and citrus which can be climate sensitive, but agricultural land use is expected to decrease. Rise in smaller agricultural/urban farms/residential gardens, and increased crop diversity. Decrease in larger agricultural users.	Increase in agricultural crop water demand per acre; small food production use of permaculture could decrease per acre use
Do groundwater supplies in your region lack resiliency after drought events?	Y	The small groundwater basins in the Region tend to decrease resiliency. Increasing impermeability reduces recharge. Sweetwater, Oceanside, Escondido/Vista. Salt water intrusion as water tables drop.	Lack of groundwater storage to buffer drought
Are water use curtailment measures effective in your region?	Y	Shortage management activities currently in place were effective in meeting demands during the last major drought which began in 2007. Management measures not previously considered, such as soil conditions, may provide additional opportunities.	Perceived limited ability to conserve further
Does water use vary by more than 50% seasonally in parts of your region?	Y	Water agencies have peaking factors ranging from 2:1 to 6:1. Some of the higher peaking agencies dependent on imported water will have reduced peaking as agricultural use declines and more development occurs.	Limited ability to meet summer demand
Are some in-stream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?	N	Most streams are intermittent; however, some agencies that move water between reservoirs via streams have in-stream requirements to protect species during certain times of the year which impacts when water can be moved.	Habitat demand would be impacted
Water Supply			
Does a portion of the water supply in your region come from snowmelt?	Y	Imported supplies (SWP, Colorado River) come from snowmelt.	Decrease in imported supply
Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?	Y	Approximately 80% of the Region's supplies are imported.	Decrease in imported supply

Vulnerability Question	Answer	Justification	Vulnerability Issue
Would your region have difficulty in storing carryover supply surpluses from year to year?	N	No, the County has sufficient storage capacity, and is currently completing an emergency storage carryover project. It should be noted that there is little transfer market available in California, with a focus of storage in northern California.	Decrease in reliability
Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?	Y	Some brackish groundwater exists near the coast which limits the use of coastal aquifers.	Decrease in groundwater supply
Has your region faced a drought in the past during which it failed to meet local water demands?	Y	Drought management plans had to be put into effect. It should be noted that the Region has never failed to meet its customers' demands once drought measures were put into place. Development of additional supplies may reduce the Region's vulnerability to this issue.	Sensitivity due to higher drought potential
Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?	Y	Quagga, Arundo, Tamarisk	Invasives can reduce supply available
Water Quality			
Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?	Y	Wildfires are a common occurrence in the area, and often cause increased erosion in the Region's watersheds.	Increased erosion and sedimentation
Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?	Y	Several water bodies are 303(d) listed for water quality issues related to eutrophication including the Lake Hodges, Famosa Slough, Guajome Lake, Loma Alta Slough, Mission Bay at the mouths of Rose Creek and Tecolote Creek, lower San Diego River, Sal Elijo Lagoon, Santa Margarita Lagoon, Tijuana River, and the Tijuana River Estuary.	Increased eutrophication
Are seasonal low flows decreasing for some water bodies in your region? If so, are the reduced low flows limiting the water bodies' assimilative capacity?	Y	At times during the year, the only flow in some streams is irrigation overflow, which in turn increase the concentration of constituents.	Increased constituent concentration
Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?	Y	At times recreation use in some reservoirs is impacted, and beach closures occur. Wildlife habitat and freshwater habitat issues as well.	Decrease in recreational opportunity

Vulnerability Question	Answer	Justification	Vulnerability Issue
Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?	Y	Total dissolved solids (TDS), turbidity and nutrient levels in reservoirs may increase during storm events, impacting water treatment, particularly after fires. Oils and feces show up in reservoirs as well.	Increase in treatment needs and cost
Sea Level Rise			
Has coastal erosion already been observed in your region?	Y	Coastal erosion occurs at unstable bluffs along the coast, for example: Sunset cliff, bluffs along City of San Diego, Encinitas, military infrastructure at Coronado Island and Camp Pendleton..	Decrease in land due to erosion
Do tidal gauges along the coastal parts of your region show an increase over the past several decades?	Y	San Diego Bay Adaptation shows increasing levels	Damage to coastal recreation/tourism due to inundation
Is there land subsidence in the coastal areas of your region?	N	None noted	
Are there coastal structures, such as levees or breakwaters, in your region?	Y	Examples include Mission Bay, San Diego Harbor	
Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?	Y	Beach community - wide-spread	
Are there climate-sensitive low-lying coastal habitats in your region?	Y	Habitat type - salt marsh	Damage to ecosystems/habitats
Are there areas in your region that currently flood during extreme high tides or storm surges?	Y	Mission Valley flooded from San Diego river during high tidal events	Storm drains and sewer systems will be inundated
Flooding			
Does critical infrastructure in your region lie within the 200-year floodplain?	Y	There is low-lying water and wastewater infrastructure. Pump stations.	Increases in inland flooding
Does aging critical flood protection infrastructure exist in your region?	Y	San Diego River Flood Improvement project. San Diego River Improvement Project (SDRIP) at Mission Valley.	

Vulnerability Question	Answer	Justification	Vulnerability Issue
Have flood control facilities (such as impoundment structures) been insufficient in the past?	Y	Flooding (and flash flooding in particular) has been a danger in certain areas of the Region due to overflowing drainage channels, low lying areas with poor drainage, and debris build-up in basins. Some areas identified by the County include localized areas in Mission Valley, Moreno Valley, Ocotillo Wells, Lemon Crest, below San Vicente Reservoir, Ramona, etc.	
Are wildfires a concern in parts of your region?	Y	Wildfires are a common occurrence in the Region.	Increases in flash flooding
Does part of your region lie within the Sacramento-San Joaquin Drainage District?	N	Not applicable	Not applicable
Ecosystem and Habitat			
Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?	Y	Erosion and sedimentation issues in Penasquitos Canyon, San Onofre, Crest Canyon, San Dieguito lagoon, Del Mar area, Encinitas area,	Increased impacts to coastal species
Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?	Y	A number of brackish lagoons exist along the coast including Batiquitos Lagoon, Buena Vista Lagoon, Agua Hedionda Lagoon, and San Elijo Lagoon.	
Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?	Y	Estuaries, coastal dunes, wetlands, marshes and exposed beaches exist along the entire coast of the region. Historically, coastal storms have caused erosion.	
Do climate-sensitive fauna or flora populations live in your region?	Y	Numerous species dependent upon the Mediterranean climate live in the Region	Decreases in ecosystem services
Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?	Y	A number of endangered and threatened species exist in the Region.	Decrease in available, necessary habitat
Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?	Y	Beach tourism, reservoir recreation, river trails	
Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?	Y	Multiple Species Habitat Conservation Plans (MSHCPs) working on ensuring corridors but some need to be created	

Vulnerability Question	Answer	Justification	Vulnerability Issue
Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change?	N	No, the Region is not within any of the ten listed habitats.	
Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?	Y	Some rivers and streams have quantified flow requirements but are primarily related to water rights. There is a bacteria Total Maximum Daily Load (TMDL) covers almost every water body in region. Nutrient TMDLs on lots of water bodies	Decrease in environmental flows
Hydropower			
Is hydropower a source of electricity in your region?	Y	Approximately 10% of electricity provided by SDG&E is hydropower. The Water Authority also produces hydroelectric power which is sold to San Diego Gas & Electric (SDG&E).	Decrease in hydropower potential
Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?	Y	Energy demand is expected to increase in the future with population increase and development. Additional hydropower was recently created at Lake Hodges/Olivenhain Reservoir, and an additional project is possible at the San Vicente Dam.	

4 Vulnerability Analysis

Once the Workgroup identified the Region's areas of concern in terms of climate change issues, it was able to begin examining the adaptability of its water resources to climate change by prioritizing the vulnerability issues. In prioritizing the vulnerability issues, the Workgroup identified those water resources that are of highest concern to the Region in terms of the significance of the impact of climate change and therefore the level of adaptation that will be needed.

4.1 Vulnerability Prioritization Process

The vulnerabilities identified were then prioritized during an exercise conducted with the Working group. Each member selected five vulnerability issues they determined should have the highest priority in being addressed. In total, the nine members of the Workgroup resulted in 45 votes. Votes were spread across nearly all of the categories, indicating the Workgroup perceived there to be a wide range of climate change vulnerabilities. The vulnerability issues were then grouped into five priority levels ranging from very high to very low according to the number of votes: very high (nine votes), high (three to four votes), medium (two to three votes), low (one to two votes), very low (no votes).

At a subsequent meeting held on July 26, 2012, the Workgroup reviewed the results and made suggestions for refinements that could be made to better align the prioritization with the vulnerabilities identified in planning documents. These suggestions were incorporated into the prioritized vulnerability issues which are shown in the next section.

4.2 Vulnerability Prioritization Results

The Region's list of prioritized vulnerabilities developed by the Workgroup is shown in Table 4, and discussed further below.

Table 4: Prioritized Climate Change Vulnerability Issues

Priority Level	Category and Vulnerability Issue
Very High	• Water Supply: Decrease in imported supply
High	• Water Supply: Sensitivity due to higher drought potential • Water Quality: Increased constituent concentrations • Flooding: Increases in flash flooding and inundation (extreme weather) • Sea Level Rise: Inundation of storm drains and sewer systems • Ecosystem/Habitat: Decrease in available necessary habitatEcosystem/Habitat: Decrease in ecosystem services
Medium	• Water Demand: Crop demand would increase • Water Demand: Industrial demand would increase • Water Supply: Decrease in groundwater supply • Water Quality: Increase in treatment cost • Sea Level Rise: Damage to coastal recreation / tourism due to inundation
Low	• Water Demand: Limited ability to conserve further • Water Supply: Lack of groundwater storage to buffer drought • Water Quality: Increased eutrophication • Flooding: Increases in inland flooding • Ecosystem/Habitat: Increased impacts to coastal species

Priority Level	Category and Vulnerability Issue
Very Low	• Water Demand: Limited ability to meet summer demand • Water Supply: Invasives can reduce supply available • Water Quality: Decrease in recreational opportunity • Sea Level Rise: Decrease in land • Sea Level Rise: Damage to ecosystem/habitat • Ecosystem/habitat: Decrease in environmental flows • Hydropower: Decrease in hydropower potential

Very High Prioritization

Water supply: Decrease in imported supply

The water supply vulnerability issue of "decrease in imported supply" was identified by the Workgroup as the highest priority issue. The Region is highly dependent on imported water with nearly 80% of its supplies currently coming from the State Water Project and the Colorado River aqueduct. Given the Region's limited local water supplies and the projected 20% to 25% decrease in imported water supply, a decrease in imported supply with climate change could have a significant impact on the Region and is an issue that needs to be addressed.

High Prioritization

Water Supply: Sensitivity due to higher drought potential

Climate change is expected to increase drought potential in the Region. In past years, water suppliers in the Region have successfully implemented drought management measures in order to lower demand. However, there are limits on the effectiveness of drought management measures. For example, tourists visiting the area are not likely to take part in drought management measures. Taking these issues into account, the Region is expected to be more susceptible to drought conditions. As drought is expected to increase in frequency and severity, more direct/long-term measures may be warranted as well as evaluation of revenue impacts to local water districts.

Water Quality: Increased constituent concentrations

The water quality vulnerability issue of increased constituent concentrations with climate change was ranked highly as water bodies in the area already require treatment to meet water quality standards, such as pathogens and nutrients. Climate change is expected to decrease local water resources in the future, which will increase constituent concentrations leading to difficulty in meeting water quality standards and increases to treatment cost.

Flooding: Increases in flash flooding and inundation (extreme weather)

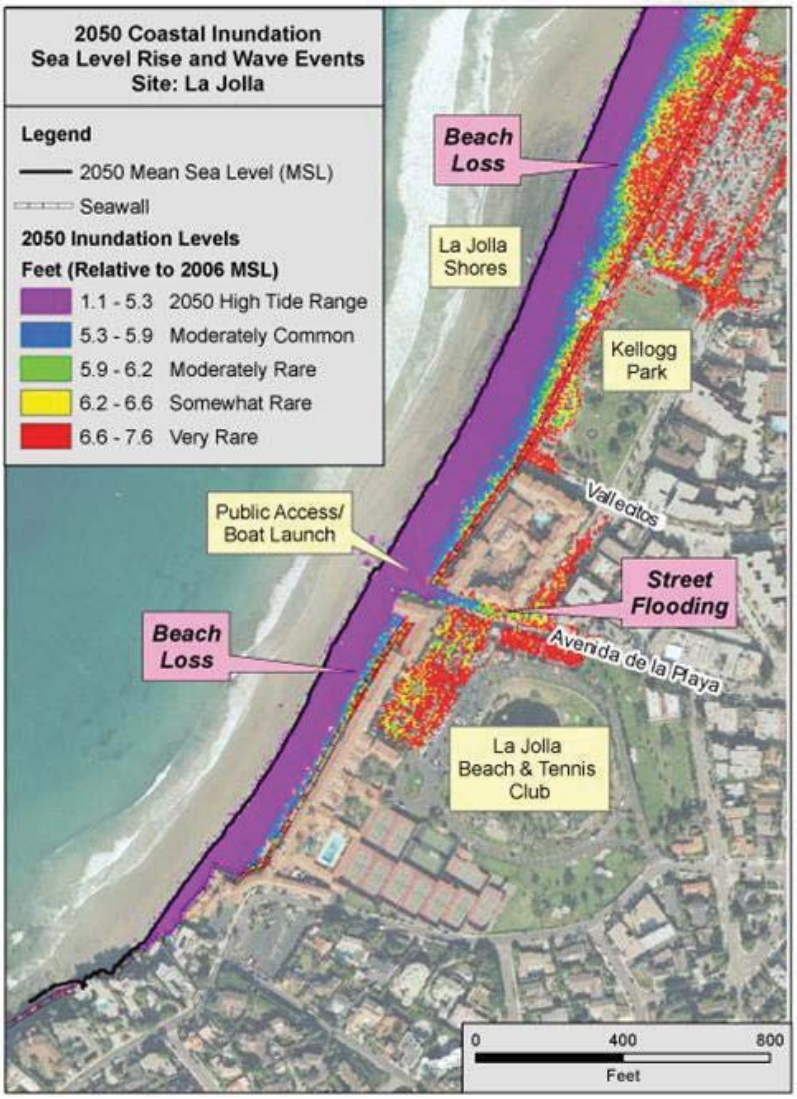
Flash flooding has been an issue for the Region in the past. Foothill areas are especially in danger from flash floods from large seasonal storms, which become a greater concern as the Region is prone to wildfires. Given that more frequent and intense storms are predicted as a consequence of climate change, in addition to increased wildfire risk, increases in flash flooding and inundation are of high concern.

Sea Level Rise: Inundation of storm drains and sewer systems

Regional studies have found that sea level rise is already occurring, and is expected to continue to rise an additional 12 and 18 inches by 2050. This new sea level will inundate a number of low-lying areas along the Region's coast such as Oceanside, La Jolla, Del Mar, Mission Beach, Coronado Island

and Camp Pendleton (Coastal Data Information Program, 2008), and impact their storm drains, wastewater systems, and other facilities and infrastructure. Coastal stormwater infrastructure and wastewater infrastructure that discharge to the ocean will be inundated with increased sea level rise, in particular during coastal storms, causing increased coastal flooding and sewer system overflows. An example of the extent of sea level rise on La Jolla is shown in Figure 2. Concern over aging systems and systems not designed for the increased capacity that will be needed with sea level rise led the group to give this issue a high-priority ranking

Figure 2: Projected 2050 Coastal Inundation with Sea Level Rise in La Jolla



(CDIP, 2008)

Ecosystem/Habitat: Decrease in available necessary habitat

The Region has numerous unique habitat areas extending from the mountains to the oceans which sensitive and endangered species are dependent upon. Anticipated higher temperatures, longer more frequent droughts, and more extreme precipitation events are projected to cause shifts and

loss of habitat necessary for these species. Of particular concern to IRWM planning is the shift and loss of riparian and wetland habitat. Riparian habitat will be altered due to decreased flows, increased water temperatures and increased constituent concentrations. These reductions in habitat and associated loss of sensitive and endangered species will, in turn, create biodiversity shifts and increase invasive species.

Ecosystem/Habitat: Decrease in ecosystem services

Ecosystem services provide important functions, such as material cycling and treatment of stormwater runoff that, if decreased, may result in the need for additional water treatment. As discussed above, climate change is expected to decrease available necessary habitat. This reduction in habitat and associated biodiversity shift and increase in invasive species is expected to decrease ecosystem services in the Region, and could result in additional cost.

Medium Prioritization

Water Demand: Increase in agricultural crop water demand per acre

Crop water demands are expected to increase with the increased temperatures caused by climate change. Though the number of acres of agricultural land is expected to decrease slightly in the future, the net demand for irrigation supply on the remaining acres may exceed current demand under climate change conditions. Through current jurisdictional plans, notably the County of San Diego General Plan, it is apparent that agriculture is an important industry to the Region, particularly smaller agricultural productions and urban farms that provide an economic base and community character to the Region. Given that agricultural land is decreasing, the Workgroup has given this climate change vulnerability issue a medium prioritization.

Water Demand: Increase in industrial demand

Industrial demand is expected to increase with temperature increases due to the need for cooling and process water. This vulnerability issue is particularly of concern for industries such as electronics and aerospace manufacturing, energy generation, research development and the pharmaceutical industry. Industrial demand increases are of concern in particular as increased demand in the Region could impact companies' decision to locate their plants within the Region, which would impact economic development.

Water Supply: Decrease in groundwater supply

Groundwater supply is projected to decline by seven inches per year with climate change. In addition, sea water intrusion caused by rising sea levels also has the potential to impact groundwater supply quality, which will reduce the amount of groundwater available for pumping. Despite these impacts, this vulnerability issue was prioritized as medium since the Region only obtains a small portion of its supplies through groundwater due to the limited size of the groundwater basins. This issue may be of a higher priority in localized areas such as the community of Lakeside, the Marine Corps Base at Camp Pendleton, Pauma Valley, the San Luis Rey River area, and National City where groundwater is a greater portion of supply.

Water Quality: Increase in treatment cost

Total dissolved solids (TDS) levels in reservoirs may increase due to increases in precipitation intensity, particularly after fires, which would in turn increase the cost of water treatment. The Region has a number of reservoirs which are downstream of forested watersheds, and are

susceptible to increased turbidity due to runoff from the surrounding area. However, this is not currently a large issues and therefore, the Workgroup rated this vulnerability issue as medium.

Sea Level Rise: Damage to coastal recreation / tourism due to inundation

As discussed previously, sea level rise is already documented as occurring, and is expected to continue to rise to between 12 and 18 inches by 2050. This rise in sea level is expected to cause damage to coastal recreation and tourism areas (such as beaches), though planning efforts such as the *Sea Level Rise Adaptation Strategy for San Diego Bay*, are ongoing. As the Region's economy relies partially on recreation and tourism, this vulnerability issue has been given a medium prioritization.

Low Prioritization

Water Demand: Limited ability to conserve further

The Region has already succeeded in implementing a large amount of water use efficiency measures. These measures have proven to be successful in mitigating against droughts such as in the severe drought that occurred in 2007. With this in mind, the Region may have difficulty in conserving further to meet greater drought frequency and intensity. However, additional savings measures are available and are being incorporated into Urban Water Management Plans and local climate action plans, which allow the Region to classify this issue as low.

Water Supply: Lack of groundwater storage to buffer drought

As mentioned under the water supply issue of decrease in groundwater supply, the Region's groundwater basins are limited in size, meaning there is very limited storage availability in the groundwater basins for use in buffering drought. Despite this, the Region's low reliability on groundwater makes this issue relatively less of a priority.

Water Quality: Increased eutrophication

Several water bodies in the Region are 303(d) listed for water quality issues related to eutrophication, including a number of lagoons, Tecolote Creek, lower San Diego River, and the Tijuana River Estuary. Consequently, it's probable that temperature increases caused by climate change could increase eutrophication of the Region's water bodies. This climate change vulnerability was ranked low, however, relative to other water quality vulnerability issues.

Flooding: Increases in inland flooding

Inland flooding was listed as a low priority for the Region, though there has been localized flooding in low-lying areas caused by insufficient and/or aging flood infrastructure. More extreme storms due to climate change could cause an increase in inland flooding, but as this is not a Region-wide issue, it has been prioritized as low as the Workgroup felt that this issue could best be addressed through local planning efforts.

Ecosystem/Habitat: Increased impacts to coastal species

Coastal dunes, wetlands, marshes and beaches provide unique habitats for the Region's species. Changes to temperature and precipitation have the potential to impact sensitive species. In addition, brackish lagoons provide estuarine habitat that depends on seasonal freshwater flow patterns. Habitat shifts and loss caused by climate change induced sea level rise, coastal erosion, and changes to freshwater flow patterns could also impact coastal species. Because coastal species

are already protected and because this is a localized issue, the Workgroup decided to classify it as low priority.

Very Low Prioritization

Water Demand: Limited ability to meet summer demand

Increased seasonal temperatures associated with climate change may create a challenge for the Region in meeting summer demands. However, as this is an issue mainly caused by agricultural and urban irrigation, it is ranked low compared to other vulnerability issues.

Water Supply: Invasives can reduce supply available

Invasive species in the Region such as Arundo, Tamarisk and Quagga mussels have the potential to damage water conveyance facilities. Climate change is expected to increase invasive species in the region, which has the potential to impact water supplies in the future. However, this is not currently an issues affecting the Region's water supply infrastructure, and therefore is ranked very low.

Water Quality: Decrease in recreational opportunity

As previously discussed, climate change is expected to increase constituent concentrations in the Region's reservoirs and beaches, a number of which are frequently used for recreation. The Regional already experiences beach closures due to poor stormwater quality which deposits contaminants in near shore areas. A decrease in water quality could impact this beneficial use of these water resources. However, because this is a localized issue, it is ranked very low.

Sea Level Rise: Decrease in land

Coastal erosion is already occurring in the Region along bluffs and cliffs. The continued rise of sea level with climate change is expected to continue to erode land along the Region's coast, and could eventually begin to impact water and wastewater facilities near to the coast, but is a localized issue.

Sea Level Rise: Damage to ecosystem/habitat

As discussed under the vulnerability issue of *increased impacts to coastal species*, sea level rise can be expected to damage coastal ecosystems and habitats. This may occur both through loss of land and through alterations to freshwater flow patterns. Again though, this is a localized issue.

Ecosystem/habitat: Decrease in environmental flows

Aquatic and wetland species often depend upon a minimum flow to survive, and could be impacted with a decrease in minimum flow caused by climate change. In addition, a reduction in flows may increase constituent concentrations in the Region's waters that could stress aquatic life. There are a number of known water quality issues that have the potential to impact species should they worsen in the future, however, there are currently no minimum environmental flows in the Region's rivers and streams,

Hydropower: Decrease in hydropower potential

The Region currently generates 40 megawatts of peak hydropower at the Olivenhain Reservoir and additional hydropower at the Rancho Peñasquitos Pressure Control Hydroelectric Facility, and is examining potential for construction of hydropower facilities elsewhere. Alterations to the Region's hydrology could decrease hydropower generation potential, however, hydropower generation within the Region is not currently a major electricity source.

Vulnerabilities Summary

As can be seen in the above discussion, the Region is faced with a wide range of climate change vulnerability issues. Should the Region not implement strategies to adapt to these, it would face a number of risks, such as:

- Insufficient water supply if current dependence on imported supply is maintained
- Inability to meet demand during droughts given increased overall seasonal demands without increases in long-term operational storage
- Poorer water quality that further impacts beneficial uses and increases treatment needs
- Damage from increased flash flooding and inland flooding
- Coastal flooding and inundation of storm drains and sewer systems due to sea level rise
- Damage to coastal ecosystems and habitats, and associated impacts to sensitive species due to reduced terrestrial flows and sea level rise

5 Climate Change Management Strategies

The next step in conducting the Region's climate change analysis is to identify appropriate strategies for adapting to the climate change vulnerability issues identified and prioritized in Chapter 4. The strategies selected will help the region to respond to or prevent future impacts of climate change on water resources. These strategies also have the potential to mitigate against further climate change by reducing the energy used to treat or convey water supplies and reducing GHG emissions, and some have the potential to provide carbon sequestration. This chapter details how the Workgroup identified, evaluated and prioritized adaptation and mitigation strategies relevant to the Region.

5.1 Identification of Strategies

Strategies were identified through the review of relevant climate change related documents. These documents include:

- California Water Plan (DWR, 2009)
- Managing an Uncertain Future (DWR, 2008)
- Climate Change Scoping Plan (CARB, 2006)
- Climate Action Team Biennial Report (CalEPA, 2010)
- Resolution on Sea Level Rise (OPC, 2010)
- California Climate Extremes Workshop Report (Scripps, 2011)

The California Water Plan contains Resource Management Strategies (RMS) that provide the primary list of strategies used for this Study. The remaining documents in the above list were reviewed for additional and/or more detailed versions of the strategies. The Workgroup reviewed the strategies from the above documents, and discussed them relative to each strategy's potential for addressing the vulnerability issues prioritized above and mitigating GHG emissions.

5.2 Strategy Prioritization

A series of criteria were used by the Workgroup to refine and prioritize the list of strategies. The Workgroup first determined which strategies may be infeasible or not currently relevant to the Region at this time, or were determined not to be desired by the Region, and were not considered further in the strategy identification process.

Following the acceptance screening process, the strategies were analyzed further by evaluating each strategy according to the following questions:

- Is the strategy a "no regret" strategy?
- Does the strategy help to adapt to the vulnerability issues identified and evaluated in Chapters 3 and 4 of this Study?
- Does the strategy help the Region to mitigate GHGs?

By definition, "no regret" strategies are those strategies that would provide benefits today while also reducing vulnerability to climate change impacts. "No regret" strategies are desirable for immediate implementation as they will provide some benefit even under the uncertainty of climate change projections. The strategies were cross referenced with the vulnerability issues discussed in Chapters 2 and 3 to determine the number and type of climate change vulnerabilities that can be addressed. In addition, a strategy received a higher priority if it addresses vulnerability issues vulnerable determined to be high priority. Finally, the strategies were evaluated to determine whether they would mitigate GHG emissions through energy efficiency, emissions reduction, and/or carbon sequestration. Appendix A shows the results of this evaluation.

Using this evaluation, an initial prioritization was completed based on the criteria shown in Table 5.

Table 5: Initial Strategy Prioritization Criteria

Tier	Criteria
Tier 1	• Considered "no regret" • Mitigates GHGs/is GHG neutral • Addresses the imported water (very high) vulnerability
Tier 2	• Included in other local climate change documents • Mitigates GHGs/is GHG neutral • Addresses at least 3 vulnerability areas
Tier 3	• Addresses at least 1 vulnerability or mitigates GHGs

This initial prioritization was then presented to the Workgroup at the August 23, 2012 meeting where the listing of strategies and prioritization were further refined to best represent the needs of the Region. The final list of prioritized climate change management strategies and definitions is shown in Table 6, Table 7 and

Table 8 as Tier 1, 2, and 3 strategies. Strategies that were not prioritized as they were determined to be infeasible or irrelevant for the Region, or would have opposition, are shown Table 9. By

prioritizing these strategies, the Region can better define the types of projects and targets that will help respond to climate change.

Table 6: Tier 1 Climate Change Management Strategies

Strategy	Description
Reduce Water Demand	
Urban water use efficiency	Technological and behavioral improvements that decrease indoor and outdoor residential, commercial, industrial and institutional water use.
Crop idling for water transfers	Remove lands from irrigation (with the aim of returning the lands to irrigation at a later time) in order to make water available for transfer.
Education	Implement outreach program to educate urban and agricultural water users in water demand reduction practices.
Gray water use	Implement gray water use systems to reduce water supply demand.
Rainfed agriculture	Transfer crop consumptive use to be supplied directly by rainfall.
Improve Operational Efficiency/Transfers	
Conveyance - Regional/local	Improvements to regional and local conveyance facilities that improve conveyance capacity, including locating and widening narrow points that constrict the movement of water to increase the water transmission capacity of the entire system, and improve operational flexibility.
System Reoperation	Change existing operation and management procedures for existing reservoirs and conveyance facilities to increase water related benefits from these facilities. May improve the efficiency of existing water uses or may increase the emphasis of one use over another.
Increase Water Supply	
Conjunctive Management & Groundwater Storage	Coordinate and plan use and management of both surface and groundwater resources to maximize the available and reliability of supplies.
Recycled Municipal Water	Increase supply of recycled water through additional wastewater treatment, and/or expand conveyance of recycled water to end users.
Improve Water Quality	
Drinking Water Treatment and Distribution	Develop and maintain adequate water treatment and distribution facilities, and protect the quality and safety of the raw water supply.
Groundwater/Aquifer Remediation	Remove contaminants that affect the beneficial use of groundwater. Can include passive or active methods.
Pollution Prevention	Prevent pollution of local surface waters and groundwater using tools that prevent point and non-point sources of pollution. Examples include water management actions and projects such as the increase of local flows, recharge area protection, etc.
Salt and Salinity Management	Manage salt and salinity in surface and/or groundwater. Examples of methods include dilution and displacement, desalination, and salt collection and storage. The Region is currently working to meet State Salinity/Nutrient Management Planning Guidelines, and will help to implement this strategy.
Urban Runoff Management	Prevent pollution of local surface waters by implementing best management practices (BMPs) designed to reduce the pollutant loading and reduce the volumes and velocities of urban runoff discharged to surface waters.
Improve Flood Management	
Flood Risk Management	Enhance flood protection through projects and programs that assist in the management of flood flows and to prepare for, respond to, and recover from a flood.
Practice Resource Stewardship	

Strategy	Description
Agricultural Lands Stewardship	Conserve natural resources and protect the environment by conserving and improving land for food, fiber and biofuels production, watershed functions, soil, air, energy, plant and other conservation purposes. Can also protect open space and the traditional characteristics of rural communities.
Economic Incentives (Loans, Grants, Water Pricing)	Provide incentives such as financial assistance, water pricing, and water market policies intended to influence water management in order to influence amount of use, time of use, wastewater volume, and source of supply.
Ecosystem Restoration	Improve the condition of modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations.
Land Use Planning and Management	Integrate land use and water management for the planning of housing and economic development needs of a growing population while providing for the efficient use of water, water quality, energy and other resources.
Recharge area protection	Protect recharge areas to ensure that areas suitable for recharge continue to be capable of adequate recharge rather than covered by urban infrastructure, and prevent pollutants from entering groundwater.
Water-dependent recreation protection	Incorporate planning for water-dependent recreation activities in water project, and implement project that protect/create water-dependent recreation opportunities.
Watershed/Soils/Forest management	Create and implement plans, programs, projects and activities to restore, sustain, and enhance watershed functions, soil functions, and forests.
Water-dependent cultural resources and practices preservation	Create and implement plans, programs, projects and activities to preserve water-dependent cultural resources and practices
Increase urban forest management	Encourage the planting of trees in urban areas to improve urban water quality and local supplies.
Sea Level Rise	
Building water facilities in coordination with land use/sea level rise (SLR) planning	Integrate water/wastewater resources planning with land use/sea level rise planning.

Table 7: Tier 2 Climate Change Management Strategies

Strategy	Description
Improve Operational Efficiency/Transfers	
Conduct emissions inventory and target	Create inventory of all emission coming from water/wastewater operations, and develop a target for reduction of emissions.
Increase use of renewable energy sources	Use renewable energy sources for the treatment and conveyance of water and wastewater.
Increase Water Supply	
Surface Storage - Regional/local	Add or increase the storage capacity of surface storage reservoirs to increase carryover storage and optimize supplies in drought situations.
Improve Flood Management	
Protective Infrastructure	Construct flood management facilities to reduce the impact of climate change enhanced flooding.
Sediment Management	Implement sediment management practices to reduce the impact of climate change enhanced flash flooding.
Sea Level Rise	
Protect water facilities through the relocation or removal of vulnerable structures	Relocate or remove water/wastewater facilities that may be impacted by sea level rise.
Protect resources and facilities by constructing seawalls or levees	Construct seawalls or levees to protect from sea level rise caused by climate change.
Protect/restore/create coastal wetlands	Protect, restore or create coastal wetlands to prevent the loss of wetland due to sea level rise.

Table 8: Tier 3 Climate Change Management Strategies

Strategy	Description
Reduce Water Demand	
Water Meters Installation	Installation of water meters in order to bill customers volumetrically.
Improve Operational Efficiency/Transfers	
Treatment and Distribution Efficiency	Improve treatment and distribution efficiency or water/wastewater systems in order to reduce energy usage.
Water Transfers	Transfer or exchange of water or water rights that result in temporary or long-term change in the point of diversion, place of use, or purpose of use.
Localized Treatment	Implement localized (or decentralized) treatment of water/wastewater to reduce the energy required for conveyance.
Shift water use to off-peak hours	Implement policies that will shift water use (e.g. irrigation) to off-peak hours to reduce evaporative loss.
Optimize Sewer Systems	Optimize sewer systems (wastewater or stormwater) to adapt to increased precipitation caused by climate change.
Increase Water Supply	
Desalination (Seawater or Brackish Groundwater)	Construct desalination plant to treat seawater or brackish groundwater.
Indirect Potable Reuse/ Potable Reuse	Implement program that will use recycled water to recharge groundwater, or use advanced treated recycled water to augment drinking water supplies.

Table 9: Additionally Reviewed Climate Change Management Strategies

Strategy
Reduce Water Demand
Irrigated Land Retirement
Improve Operational Efficiency/Transfers
Conveyance - Delta
Increase Water Supply
Waterbag Transport/Storage Technology
Precipitation Enhancement
Surface Storage – CALFED
Dewvaporation or Atmospheric Pressure Desalination
Fog Collection
Matching Quality to Use
Sea Level Rise
Rolling Easements
Expendable/Movable Structures in Risk Areas

5.3 Performance Measures/Metrics for Adaptation and Mitigation Strategies

The set of strategies evaluated in the previous section were determined to be those that will best help the Region in responding to and reducing climate change impacts. When implementing these strategies, it will be necessary to develop performance measures or metrics to assess the effectiveness of a project in meeting the Region's goals. Though specific measures and metrics will be defined according a specific project or portfolio of projects, Table 10 provides examples of how these measures or metrics might be defined according to general water resource perspective. It should be noted that several of the strategies (the no regret strategies) may apply to additional objectives in the Region's IRWM Plan, and not solely to adapting to and/or mitigating climate change. Without specific metrics, it would be difficult to assess the effectiveness of strategies in responding to climate change. Moreover, some of the strategies implemented to adapt to climate change are "good planning" for future vulnerabilities and may not be immediately measurable. Many of the effects of climate change are anticipated past the planning horizon of the IRWM Plan. To respond to this uncertainty, the Region should update this climate change analysis during each IRWM Plan update, and implement adaptive management measures which will be discussed in the next chapter.

Table 10: Sample Performance Measures/Metrics

Strategy Category	Sample Performance Measures/Metrics
Reduce Water Demand	• Average (annual) water demand reduction • Peak (seasonal, monthly) water demand reduction
Improve Operational Efficiency	• Additional supply • Supply reliability
Increase Water Supply	• Additional supply • Potable demand offset • Supply reliability
Improve Water Quality	• Salt line migration • Stream temperature • Dissolved oxygen • Turbidity • Pollutant concentrations
Improve Flood Management	• Acres of a certain habitat or floodplain function restored/protected • Volume of natural flood storage provided • Storm return period used for planning • Expected damage resulting for a certain return period storm
Practice Resource Stewardship	• Presence/absence of key indicator species • Acres of a certain habitat or floodplain function restored/protected • Volume of natural flood storage provided • Acres of recharge area protected
Sea Level Rise	• Acres of coastal wetlands created/restored/protected • Miles of pipeline or number of facilities relocated away from coastlines • Length of coastline protected by seawalls or levees

6 Recommendations

The Region has taken the first steps in planning for climate change by examining current climate change projections to determine potential impacts, assessing water resource vulnerabilities, and developing a series of strategies that can be used in projects to adapt to climate change and mitigate GHGs. Chapter 6 discussed recommendations that may be used to successfully implement these strategies, including: use of adaptive management, objectives and targets for inclusion in the IRWM Plan, and project selection considerations for including climate change.

6.1 Adaptive Management

There is a level of uncertainty in projecting the effects and impacts of climate change. To respond to this, DWR recommends the use of adaptive management in implementing climate change strategies (DWR, 2011). Adaptive management consists of identifying and monitoring the most important uncertainties and translating them into risk triggers or early warning indicators. This allows for a flexible path of actions to take as triggers occur. DWR's *Climate Change Handbook* recommends the following steps in developing an adaptive management plan:

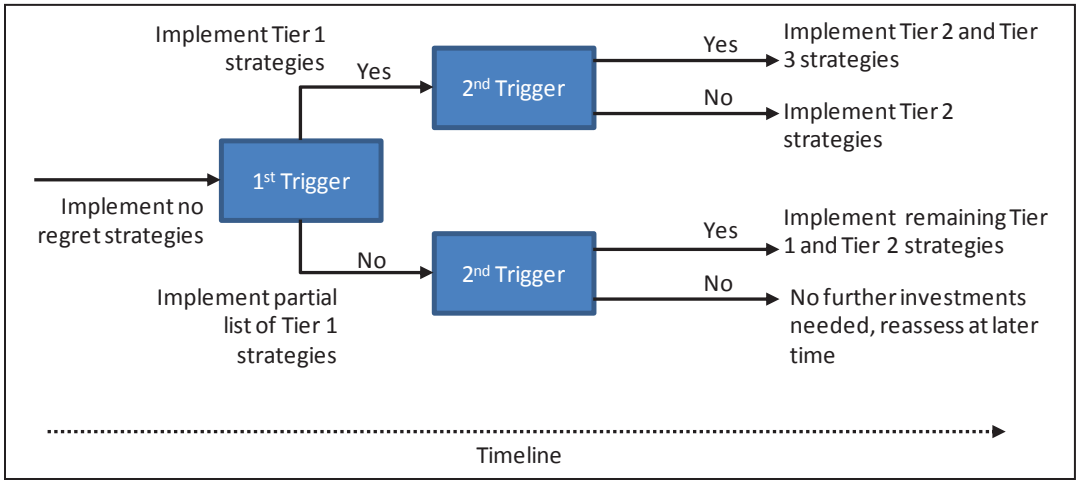
1. Identify risk triggers associated with important vulnerabilities or uncertainties
2. Quantify impacts and uncertainties
3. Evaluate strategies and define flexible implementation paths of action that allows for multiple options at specific triggers
4. Monitor performance and critical variables in the system
5. Implement or reevaluate strategies when triggers are reached

Under Step 1, the Region identifies risk triggers in order to monitor the Region's response to climate change. Risk triggers can be established deterministically (e.g., a threshold) or probabilistically (e.g. frequency of exceedance). The quantification of risk triggers are developed in Step 2, and serve as the basis for the definition of a path for plan implementation under Step 3.

Step 3 involves the definition of an implementation path for the evaluated strategies, and is central to the adaptive management process. The implementation path incorporates risk triggers over the course of time to allow the Region to determine what level of climate change adaptation/mitigation strategy should be implemented. Step 4 of the process, performance monitoring, incorporates performance measures and metrics used to evaluate water resources projects, and will help to define whether a risk trigger has been reached. Step 4 leads into the final step of implementing or reevaluating strategies, Step 5. The general structure of an adaptive management plan can be seen in Figure 3.

The key to successfully implementing the adaptive management process over time is continued active participation by stakeholders, and a clear understanding of project objectives. This should involve ongoing identification, monitoring, and updating of the most important impacts and uncertainties, and re-evaluation of the Region's vulnerabilities (DWR, 2011).

Figure 3: General Adaptive Management Plan



6.2 Climate Change Related Objectives and Targets

DWR requires that climate change be incorporated in the development of IRWM Plan objectives in terms of both climate change adaptation and GHG mitigation (DWR, 2012b). The strategies developed in Chapter 4 include both adaptation and mitigation, and therefore can be incorporated into climate change related objectives and targets that will meet DWR's requirement. The following objective and targets are recommended for inclusion in the IRWM Plan:

Objective: Effectively address climate change through adaptation and mitigation in water resource management.

Target 1: Encourage development of cost-effective carbon-efficient strategies for water management projects.

Target 2: Incorporate adaptation strategies to respond to sea-level rise, rainfall variability, and temperature variability in planning for water and wastewater management.

Target 3: Reduce or neutralize GHG emissions in all areas of water resource management.

6.3 Climate Change in Project Selection Considerations

In order for the Region to adapt to and mitigate against climate change, it will be necessary to ensure that projects utilize strategies identified in this study as helping the Region to adapt to and mitigate against climate change. It is recommended that the Region consider using the strategy priority levels discussed in Chapter 5 to assess the adaptation capacity of the project, and also consider whether the project helps the Region to mitigate GHGs. Oftentimes, a project that implements multiple strategies has the potential to increase the level of benefits provided while reducing the unit cost.

A recommended prioritization approach is presented in Table 11. In these prioritization criteria, projects are given higher priority for utilizing Tier 1 strategies and lower priority for Tier 3 strategies. Additionally, projects that contribute to two or more GHG measures, including energy efficiency, emissions reduction and carbon sequestration, are prioritized more highly. Projects that

contribute to one of these mitigation measures receive higher prioritization, and projects that would increase GHGs receive reduce prioritization. In the future, it is recommended that the Region define a threshold for GHG production or remediation to be used in the prioritization of projects. A worksheet to assist the Region in scoring projects according to the number of strategies utilized can be found in Appendix B. In this way, the Region can ensure that projects will help it to both adapt to climate change vulnerabilities of high concern, and will mitigate against climate change.

Table 11: Climate Change Project Prioritization Criteria

Adaptation	Mitigation[1]	Priority
Tier 1 Strategy	Contributes to 2 out of 3 mitigation measures	High
	Contributes to 1 out of 3 mitigation measures	High
	Increases greenhouse gasses	Medium or Low
Tier 2 Strategy	Contributes to 2 out of 3 mitigation measures	High
	Contributes to 1 out of 3 mitigation measures	Medium
	Increases greenhouse gasses	Low
Tier 3 Strategy	Contributes to 2 out of 3 mitigation measures	Medium
	Contributes to 1 out of 3 mitigation measures	Low
	Increases greenhouse gasses	Low

1. Mitigation measures referred to are: energy efficiency, emissions reduction, and carbon sequestration

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Appendix D - AWWA Water Loss Audit

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AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.1

Back to Instructions

? Click to access definition

Water Audit Report for: CITY OF OCEANSIDE
Reporting Year: 2015 7/2014 - 6/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED

<< Enter grading in column 'E'

Volume from own sources:	?	9	3,231.800	acre-ft/yr
Master meter error adjustment (enter positive value):	?	10	0.000	acre-ft/yr
Water imported:	?	9	23,081.700	acre-ft/yr
Water exported:	?			acre-ft/yr
WATER SUPPLIED:			26,313.500	acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:	Value:
Billed metered:	?	9	24,937.300	acre-ft/yr		
Billed unmetered:	?		0.000	acre-ft/yr		
Unbilled metered:	?		0.000	acre-ft/yr		
Unbilled unmetered:	?	8	60.300	acre-ft/yr		60.300
AUTHORIZED CONSUMPTION:	?		24,997.600	acre-ft/yr		

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

1,315.900 acre-ft/yr

Apparent Losses

					Pcnt:	Value:
Unauthorized consumption:	?		65.784	acre-ft/yr	0.25%	
Customer metering inaccuracies:	?	9	1,039.054	acre-ft/yr	4.00%	
Systematic data handling errors:	?	8	7.000	acre-ft/yr		
Apparent Losses:	?		1,111.838			

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

? Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	?		204.062	acre-ft/yr
WATER LOSSES:			1,315.900	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 1,376.200 acre-ft/yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	?	9	591.0	miles	
Number of active AND inactive service connections:	?	9	43,755		
Connection density:			74	conn./mile main	
Average length of customer service line:	?	9	24.0	ft	(pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	?	9	60.0	psi	

COST DATA

Total annual cost of operating water system:	?	8	$46,825,839	$/Year
Customer retail unit cost (applied to Apparent Losses):	?	10	$3.87	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	?	9	$1,208.00	$/acre-ft/yr

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	5.2%
Non-revenue water as percent by cost of operating system:	4.7%
Annual cost of Apparent Losses:	$1,874,305
Annual cost of Real Losses:	$246,507

Operational Efficiency Indicators

Apparent Losses per service connection per day:	22.69	gallons/connection/day
Real Losses per service connection per day*:	4.16	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.07	gallons/connection/day/psi
? Unavoidable Annual Real Losses (UARL):	246.42	million gallons/year
From Above, Real Losses = Current Annual Real Losses (CARL):	204.06	million gallons/year
? Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.27	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 87 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Unauthorized consumption
3: Total annual cost of operating water system

For more information, click here to see the Grading Matrix worksheet

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Appendix E - Drought Ordinances

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ORDINANCE NO. 08-OR0439-1

AN ORDINANCE OF THE CITY OF OCEANSIDE AMENDING THE OCEANSIDE CITY CODE, CHAPTER 37, ARTICLE V., BY REVISING THE EXISTING WATER CONSERVATION PROGRAM AND ADDING DROUGHT RESPONSE CONSERVATION MEASURES TO BE IMPLEMENTED IN THE EVENT OF MANDATORY WATER REDUCTIONS

WHEREAS, on March 27, 1991, the City Council adopted Ordinance No. 091-15, which established a water conservation program for the City;

WHEREAS, article 10, section 2 of the California Constitution declares that waters of the State are to be put to beneficial use, that waste, unreasonable use, or unreasonable method of use of water be prevented, and that water be conserved for the public welfare; and

WHEREAS, conservation of current water supplies and minimization of the effects of water supply shortages that are the result of drought are essential to the public health, safety and welfare; and

WHEREAS, regulation of the time of certain water use, manner of certain water use, design of rates, method of application of water for certain uses, installation and use of water-saving devices, provide an effective and immediately available means of conserving water; and

WHEREAS, adoption and enforcement of a comprehensive water conservation program will allow the City of Oceanside to delay or avoid implementing measures such as water rationing or more restrictive water use regulations pursuant to a declared water shortage emergency as authorized by California Water Code sections 350 et seq; and

WHEREAS, San Diego County is a semi-arid region and local water resources are scarce. The region is dependent upon imported water supplies provided by the San Diego County Water Authority, which obtains a substantial portion of its supplies from the Metropolitan Water District of Southern California. Because the region is dependent upon

imported water supplies, weather and other conditions in other portions of this State and of the Southwestern United States affect the availability of water for use in San Diego County; and

WHEREAS, the San Diego County Water Authority has adopted an Urban Water Management Plan that includes water conservation as a necessary and effective component of the Water Authority's programs to provide a reliable supply of water to meet the needs of the Water Authority's 24 member public agencies, including the City of Oceanside. The Water Authority's Urban Water Management Plan also includes a contingency analysis of actions to be taken in response to water supply shortages. This ordinance is consistent with the Water Authority's Urban Water Management Plan; and

WHEREAS, as anticipated by its Urban Water Management Plan, the San Diego County Water Authority, in cooperation and consultation with its member public agencies, has adopted a Drought Management Plan, which establishes a progressive program for responding to water supply limitations resulting from drought conditions. This ordinance is intended to be consistent with and to implement the Water Authority's Drought Management Plan; and

WHEREAS, the Water Authority's Drought Management Plan contains three stages containing regional actions to be taken to lessen or avoid water supply shortages. This ordinance contains drought response levels that correspond with the Drought Management Plan stages; and

WHEREAS, the City of Oceanside, due to the geographic and climatic conditions within its territory and its dependence upon water imported and provided by the San Diego County Water Authority, may experience shortages due to drought conditions, regulatory restrictions enacted upon imported supplies and other factors. The City of Oceanside has adopted an Urban Water Management Plan and a Water Conservation Program (Oceanside City Code, Chapter 37, Article V) that includes water conservation as a necessary and effective component of its programs to provide a reliable supply of water to meet the needs of the public within its service territory. The City of Oceanside's Urban Water Management Plan and Water Conservation Program also include a contingency analysis of actions to be taken in response to water supply

shortages. This ordinance is consistent with the Urban Water Management Plan and the Water Conservation Program adopted by the City of Oceanside; and

WHEREAS, the water conservation measures and progressive restrictions on water use and method of use identified by this ordinance provide certainty to water users and enable the City of Oceanside to control water use, provide water supplies, and plan and implement water management measures in a fair and orderly manner for the benefit of the public.

WHEREAS, the City Council has determined that the water conservation program shall be amended by including revised methods to reduce under certain circumstances potable water use and establishing a Drought Response Conservation Program to be implemented in the event of mandatory water reductions as determined by the Metropolitan Water District of Southern California and the San Diego County Water Authority, which are the City's external water providers.

NOW, THEREFORE, the City Council of the City of Oceanside DOES ORDAIN as follows:

SECTION 1. Sec. 37.101 of the Oceanside City Code shall be amended to read as follows:

"Sec. 37.101 Declaration of Necessity and Intent

"(a) This ordinance establishes water management requirements necessary to conserve water, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, prevent unreasonable use of water, prevent unreasonable method of use of water within the City of Oceanside in order to assure adequate supplies of water to meet the needs of the public, and further the public health, safety, and welfare, recognizing that water is a scarce natural resource that requires careful management in times of drought, but at all times.

(b) This ordinance establishes regulations to be implemented during times of declared water shortages, or declared water shortage emergencies. It establishes four levels of drought response actions to be implemented in times of shortage, with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies.

(c) Level 1 condition drought response measures are voluntary and will be reinforced through local and regional public education and awareness measures that may be funded in part by the City of Oceanside. During drought response conditions Levels 2 through 4, all conservation measures and water-use restrictions are mandatory and become increasingly restrictive in order to attain escalating conservation goals.

(d) During a Drought Response Level 2 condition or higher, the water conservation measures and water use restrictions established by this ordinance are mandatory and violations are subject to criminal, civil, and administrative penalties and remedies specified in this ordinance and as provided in the Oceanside City Code."

SECTION 2. Sec.37.101.1 shall be added and shall read as follows:

"Sec. 37.101.1 Application

(a) The provisions of this ordinance apply to any person in the use of any water provided by the City of Oceanside.

(b) This ordinance is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to Chapter 40 of the Oceanside City Code or the Regional Water Quality Control Board for information on any urban runoff/stormwater ordinances or urban runoff/stormwater management plans.

(c) Nothing in this ordinance is intended to affect or limit the ability of the City of Oceanside to declare and respond to an emergency, including an emergency that affects the ability of the City of Oceanside to supply water.

(d) The provisions of this ordinance do not apply to use of water from private wells or to recycled water.

(e) Nothing in this ordinance shall apply to use of water that is subject to a special supply program, such as the Metropolitan Interim Agricultural Water Program or the Water Authority Special Agricultural Rate programs. Violations of the conditions of the special supply programs are subject to the penalties established under the applicable program. A

person using water subject to a special supply program and other water provided by the City of Oceanside is subject to this ordinance in the use of the other water."

SECTION 3. Sec. 37.103 (c) shall be amended to read as follows:

"(c) Water users shall not let water leave the property by draining onto adjacent properties or public or private roadways due to irrigation or failure to correct known leaks. Spraying hard surfaces during irrigation activities is prohibited."

SECTION 4. **Sec. 37.105. Definitions** shall be amended by adding the following:

" (j) *DMP* means the Water Authority's Drought Management Plan in existence on the effective date of this ordinance and as readopted or amended from time to time, or an equivalent plan of the Water Authority to manage or allocate supplies during shortages.

(k) *Grower* refers to those engaged in the growing or raising, in conformity with recognized practices of husbandry, for the purpose of commerce, trade, or industry, or for use by public educational or correctional institutions, of agricultural, horticultural or floricultural products, and produced: (1) for human consumption or for the market, or (2) for the feeding of fowl or livestock produced for human consumption or for the market, or (3) for the feeding of fowl or livestock for the purpose of obtaining their products for human consumption or for the market. "Grower" does not refer to customers who purchase water subject to the Metropolitan Interim Agricultural Water Program or the Water Authority Special Agricultural Rate programs.

(l) *Metropolitan* means the Metropolitan Water District of Southern California.

(m) *Person* means any natural person, corporation, public or private entity, public or private association, public or private agency, government agency or institution, school district, college, university, or any other user of water provided by the City of Oceanside.

(n) *Water Authority* means the San Diego County Water Authority."

SECTION 5. Sec. 37.106 shall be amended to read as follows:

"**Sec. 37.106. Conservation levels**

(a) General conditions. Customers are always asked to use water wisely and to practice water conservation measures so that water is not wasted. Under these conditions, the City of

Oceanside has sufficient water supplies to meet normal and local emergency water supply needs. To protect and to enhance the city's overall use of local water supply, water treatment devices that waste potable water or that degrade wastewater so that it cannot be utilized for reclaimed water or local basin recharge will not be sold to or utilized by any users unless necessary for authorized medical reasons. The City encourages customers to follow the water conservation practices listed in Drought Response Level 1 at all times.

(b) Drought Response Level 1 – Drought Watch Condition

1. A Drought Response Level 1 condition is also referred to as a "Drought Watch" condition. A Level 1 condition applies when the Water Authority notifies its member agencies that due to drought or other supply reductions, there is a reasonable probability there will be supply shortages and that a consumer demand reduction of up to 10 percent is required in order to ensure that sufficient supplies will be available to meet anticipated demands. The Water Utilities Director shall declare the existence of a Drought Response Level 1 and take action to implement the Level 1 conservation practices indentified in this ordinance.

2. During a Level 1 Drought Watch condition, the City of Oceanside will increase its public education and outreach efforts to emphasize increased public awareness of the need to implement the following water conservation practices:

a. Stop washing down paved surfaces, including but not limited to sidewalks, driveways, parking lots, tennis courts, or patios, except when it is necessary to alleviate safety or sanitation hazards.

b. Stop water waste resulting from inefficient landscape irrigation, such as runoff, low head drainage, or overspray, etc. Similarly, stop water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

c. Irrigate residential and commercial landscape before 10:00 a.m. and after 6:00 p.m. only.

d. Use a hand-held hose equipped with a positive shut-off nozzle or bucket to water landscaped areas, including trees and shrubs located on residential and commercial properties that are not irrigated by a landscape irrigation system.

e. Irrigate nursery and commercial grower's products before 10:00 a.m. and after 6:00 p.m. only. Watering is permitted at any time with a hand-held hose equipped with a positive shut-off nozzle, a bucket, or when a drip/micro-irrigation system/equipment is used. Irrigation of nursery propagation beds is permitted at any time. Watering of livestock is permitted at any time.

f. Use re-circulated water to operate ornamental fountains.

g. Wash vehicles using a bucket and a hand-held hose with positive shut-off nozzle, mobile high pressure/low volume wash system, or at a commercial site that re-circulates (reclaims) water on-site. Avoid washing during hot conditions when additional water is required due to evaporation.

h. Serve and refill water in restaurants and other food service establishments only upon request.

i. Offer guests in hotels, motels, and other commercial lodging establishments the option of not laundering towels and linens daily.

j. Repair all water leaks within five (5) days of notification by the City of Oceanside unless other arrangements are made with the Water Utilities Director.

k. Use recycled or non-potable water for construction purposes when available.

3. During a Drought Response Level 2 condition or higher, all persons shall be required to implement the conservation practices established in a Drought Response Level 1 condition.

(c) Drought Response Level 2 – Drought Alert Condition

1. A Drought Response Level 2 condition is also referred to as a "Drought Alert" condition. A Level 2 condition applies when the Water Authority notifies its member agencies that due to cutbacks caused by drought or other reduction in supplies, a consumer demand reduction of up to 20 percent is required in order to have sufficient supplies available to meet anticipated demands. The Oceanside City Council shall adopt a resolution declaring the existence of a Drought Response Level 2 condition and implementing the mandatory Level 2 conservation measures indentified in this ordinance.

2. All persons using City of Oceanside water shall comply with Level 1 Drought Watch water conservation practices during a Level 2 Drought Alert, and shall also comply with the following additional conservation measures:

a. Limit residential and commercial landscape irrigation to no more than three (3) assigned days per week on a schedule established by the Water Utilities Director and posted by the City of Oceanside. During the months of November through May, landscape irrigation is limited to no more than once per week on a schedule established by the Water Utilities Director and posted by the City of Oceanside. This section shall not apply to commercial growers or nurseries.

b. Limit lawn watering and landscape irrigation using sprinklers to no more than ten (10) minutes per water station per assigned day. This provision does not apply to landscape irrigation systems using water efficient devices, including but not limited to: weather-based controllers, drip/micro/irrigation systems or stream rotor sprinklers.

c. Water landscaped areas, including trees and shrubs located on residential and commercial properties, and not irrigated by a landscape irrigation system governed by subsection 37.106(c)2.a., on the same schedule set forth in subsection 37.106(c)2.a. by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation.

d. Repair all leaks within seventy-two (72) hours of notification by the City of Oceanside unless other arrangements are made with the Water Utilities Director.

e. Stop operating ornamental fountains or similar decorative water features unless recycled water is used.

(d) Drought Response Level 3 – Drought Critical Condition

1. A Drought Response Level 3 condition is also referred to as a "Drought Critical" condition. A Level 3 condition applies when the Water Authority notifies its member agencies that due to increasing cutbacks caused by drought or other reduction of supplies, a consumer demand reduction of up to 40 percent is required in order to have sufficient supplies available to meet anticipated demands. The Oceanside City Council shall adopt a resolution declaring

the existence of a Drought Response Level 3 condition and implementing the Level 3 conservation measures identified in this ordinance.

2. All persons using City of Oceanside water shall comply with Level 1 Drought Watch and Level 2 Drought Alert water conservation practices during a Drought Response Level 3 condition, and shall also comply with the following additional mandatory conservation measures:

a. Limit residential and commercial landscape irrigation to no more than two (2) assigned days per week on a schedule established by the Water Utilities Director and posted by the City of Oceanside. During the months of November through May, landscape irrigation is limited to no more than once per week on a schedule established by the Water Utilities Director and posted by the City of Oceanside. This section shall not apply to commercial growers or nurseries.

b. Water landscaped areas, including trees and shrubs located on residential and commercial properties, and not irrigated by a landscape irrigation system governed by subsection 37.106(d)2.a., on the same schedule set forth in subsection 37.106(d)2.a. by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation.

c. Stop filling or re-filling ornamental lakes or ponds, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a drought response level under this ordinance.

d. Stop washing vehicles except at commercial carwashes that re-circulate water, or by high pressure/low volume wash systems.

e. Repair all leaks within forty-eight (48) hours of notification by the City of Oceanside unless other arrangements are made with the Water Utilities Director.

3. Upon the declaration of a Drought Response Level 3 condition, no new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve

letters, certificates, or letters of availability) shall be issued, except under the following circumstances:

a. A valid, unexpired building permit has been issued for the project; or

b. The project is necessary to protect the public's health, safety, and welfare; or

c. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City of Oceanside.

This provision shall not be construed to preclude the resetting or turn-on of meters to provide continuation of water service or to restore service that has been interrupted for a period of one year or less.

d. Upon declaration of a Drought Response Level 3 condition, the City of Oceanside will suspend consideration of annexations to its service area.

e. The City of Oceanside may establish a water allocation for property served by the City of Oceanside using a method that does not penalize persons for the implementation of conservation methods or the installation of water saving devices. If the City of Oceanside establishes a water allocation it shall provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the City of Oceanside customarily mails the billing statement for the fees or charges for on-going water service. The notice of allocation may also include notice that water usage in excess of the allocation will be subject to a penalty in a specified amount for each billing unit of water used in excess of the allocation. The penalty for excess water use shall be cumulative to any other remedy or penalty that may be imposed for violation of this ordinance.

(e) Drought Response Level 4 – Drought Emergency Condition

1. A Drought Response Level 4 condition is also referred to as a "Drought Emergency" condition. A Level 4 condition applies when the Water Authority Board of Directors declares a water shortage emergency pursuant to California Water Code section 350 and notifies its member agencies that a Level 4 requires a demand reduction of more than 40 percent in order for the City of Oceanside to have maximum water supplies available to meet anticipated

demands. The City of Oceanside shall declare a Drought Emergency in the manner and on the grounds provided in California Water Code section 350.

2. Upon declaration of a Drought Emergency, all persons using City of Oceanside water shall comply with conservation measures required during Level 1 Drought Watch, Level 2 Drought Alert, and Level 3 Drought Critical conditions and shall also comply with the following additional mandatory conservation measures:

a. Stop all landscape irrigation, except crops and landscape products of commercial growers and nurseries. This restriction shall not apply to the following categories of use unless the City of Oceanside has determined that recycled water is available and may be lawfully applied to the use.

(1) Maintenance of trees and shrubs that are watered on the same schedule set forth in subsection 37.106(d)2.a. by using a bucket, hand-held hose with a positive shut-off nozzle, or low-volume non-spray irrigation;

(2) Maintenance of existing landscaping necessary for fire protection as specified by the Fire Marshall of the local fire protection agency having jurisdiction over the property to be irrigated;

(3) Maintenance of existing landscaping for erosion control;

(4) Maintenance of plant materials identified to be rare or essential to the well-being of rare animals;

(5) Maintenance of landscaping within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two (2) days per week according the schedule established under subsection 37.106(d)2.a.;

(6) Watering of livestock; and

(7) Public works projects and actively irrigated environmental mitigation projects.

b. Repair all leaks within twenty-four (24) hours of notification by the City of Oceanside unless other arrangements are made with the Water Utilities Director.

3. The City of Oceanside may establish a water allocation for property served by the City of Oceanside. If the City of Oceanside establishes a water allocation it shall provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the City of Oceanside customarily mails the billing statement for the fees or charges for on-going water service. The notice of allocation may also include notice that water usage in excess of the allocation will be subject to a penalty in a specified amount for each billing unit of water used in excess of the allocation. The penalty for excess water use shall be cumulative to any other remedy or penalty that may be imposed for violation of this ordinance.

SECTION 6. Sec. 37.107 shall be amended to read as follows:

"Sec. 37.107. Correlation between Drought Management Plan and Drought Response Levels

(a) The correlation between the Water Authority's DMP stages and the City of Oceanside's drought response levels identified in this ordinance is described herein. Under DMP Stage 1, the City of Oceanside would implement Drought Response Level 1 actions. Under DMP Stage 2, the City of Oceanside would implement Drought Response Level 1 or Level 2 actions. Under DMP Stage 3, the City of Oceanside would implement Drought Response Level 2, Level 3, or Level 4 actions.

(b) The drought response levels identified in this ordinance correspond with the Water Authority DMP as identified in the following table:

Drought Response Levels	Use Restrictions	Conservation Target	DMP Stage
1 – Drought Watch	Voluntary	Up to 10%	Stage 1 or 2
2 – Drought Alert	Mandatory	Up to 20%	Stage 2 or 3
3 – Drought Critical	Mandatory	Up to 40%	Stage 3
4 – Drought Emergency	Mandatory	Above 40%	Stage 3

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SECTION 7. Sec. 37.108 shall be amended to read as follows:

"Sec. 37.108. Procedures for Determination and Notification of Drought Response Level.

(a) The existence of a Drought Response Level 1 condition may be declared by the Water Utilities Director upon a written determination of the facts and circumstances supporting the determination. A copy of the written determination shall be filed with the Oceanside City Clerk and provided to the Oceanside City Council. The Water Utilities Director may publish a notice of the determination of existence of Drought Response Level 1 condition in one or more newspapers, including a newspaper of general circulation within the City of Oceanside. The City of Oceanside may also post notice of the condition on its website.

(b) The existence of Drought Response Level 2 or Level 3 conditions may be declared by resolution of the Oceanside City Council adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation measures applicable to Drought Response Level 2 or Level 3 conditions shall take effect on the tenth (10) day after the Oceanside City Council adopts a resolution declaring the response level. Within five (5) days following the declaration of the response level, the City of Oceanside shall publish a copy of the resolution in a newspaper used for publication of official notices.

(c) The existence of a Drought Response Level 4 condition may be declared in accordance with the procedures specified in California Water Code Sections 351 and 352. The mandatory conservation measures applicable to Drought Response Level 4 conditions shall take effect on the tenth (10) day after the date the response level is declared. Within five (5) days following the declaration of the response level, the City of Oceanside shall publish a copy of the resolution in a newspaper used for publication of official notices. If the City of Oceanside establishes a water allocation, it shall provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the City of Oceanside customarily mails the billing statement for the fees or charges for on-going water service. Water allocation shall be effective on the fifth (5) day following the date of the mailing or at such later date as specified in the notice.

(d) The Oceanside City Council may declare an end to the Drought Response Level by the adoption of a resolution at any regular or special meeting held in accordance with State law."

SECTION 8. Subsection (a) of 37.109 shall be amended to read as follows:

"Sec. 37.109. **Violation, remedies.**

(a) The penalties for violations of this article are set forth in Section 1.7 and Section 1.14 et seq. of the City Code."

SECTION 9. **Severability.**

If any section, sentence, clause or phrase of this ordinance is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance and adopted this ordinance and each section, sentence, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared invalid or unconstitutional."

SECTION 10. The City Clerk of the City of Oceanside is hereby directed to publish this ordinance, or the title hereof as a summary, pursuant to state statute, once within ten (10) days after its passage in the North County Times, a newspaper of general circulation published in the City of Oceanside.

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SECTION 11. This ordinance shall take effect and be in force upon adoption.

INTRODUCED at a regular meeting of the City Council of the City of Oceanside held on the 18th day of June, 2008, and, thereafter,

PASSED, AND ADOPTED by the City Council of the City of Oceanside, California this 9th day of July, 2008, by the following vote:

AYES: WOOD, CHAVEZ, FELLER, KERN, SANCHEZ
NAYS: NONE
ABSENT: NONE
ABSTAIN: NONE

MAYOR, CITY OF OCEANSIDE

ATTEST:

CITY CLERK

APPROVED AS TO FORM:

CITY ATTORNEY

AN ORDINANCE OF THE CITY OF OCEANSIDE AMENDING THE OCEANSIDE CITY CODE, CHAPTER 37, ARTICLE V., BY REVISING THE EXISTING WATER CONSERVATION PROGRAM AND ADDING DROUGHT RESPONSE CONSERVATION MEASURES TO BE IMPLEMENTED IN THE EVENT OF MANDATORY WATER REDUCTIONS

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ORDINANCE NO. 15-OR0276-1

AN URGENCY ORDINANCE OF THE CITY OF OCEANSIDE AMENDING OCEANSIDE CITY CODE, CHAPTER 37, ARTICLE V REVISING AND UPDATING THE WATER CONSERVATION PROGRAM AND THE DROUGHT RESPONSE CONSERVATION MEASURES

WHEREAS, on March 27, 1991, the City Council adopted Ordinance No. O91-15, which established a water conservation program for the City; and

WHEREAS, Article 10, Section 2 of the California Constitution declares that waters of the State are to be put to beneficial use, that waste, unreasonable use, or unreasonable method of use of water be prevented, and that water be conserved for the public welfare; and

WHEREAS, conservation of current water supplies and minimization of the effects of water supply shortages that are the result of drought are essential to the public health, safety and welfare; and

WHEREAS, the State of California is experiencing unprecedented drought conditions with 2014 projected to become the driest year on record; and

WHEREAS, on January 17, 2014, the Governor issued a proclamation of a state of emergency under the California Emergency Services Act based on drought conditions; and

WHEREAS, on April 1, 2015, the Governor issued an Executive Order that, in part, directs the State Board to impose restrictions on water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February, 2016; and

WHEREAS, the present year is critically dry and has been immediately preceded by two or more consecutive below normal, dry, or critically dry years; and

WHEREAS, the drought conditions will likely continue for the foreseeable future and additional action by both the State Water Resources Control Board and local water suppliers will likely be necessary to prevent waste and unreasonable use of water and to further promote conservation; and

Whereas, present conditions create an imminent threat to the public health and welfare, and must be addressed immediately. Failure to address present conditions may result in a shortage of water for the Citizens of Oceanside, and could subject the City to substantial fines and penalties.

NOW, THEREFORE, the City Council of the City of Oceanside DOES ORDAIN as follows:

SECTION 1. Section 37.101, subdivision (a) of the Oceanside City Code shall be amended to read as follows:

Sec. 37.101 Declaration of Necessity and Intent

(a) This article establishes water management requirements necessary to conserve water, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, prevent unreasonable use of water, prevent unreasonable method of use of water within the City of Oceanside in order to assure adequate supplies of water to meet the needs of the public, and further the public health, safety, and welfare, recognizing that water is a scarce natural resource that requires careful management not only in times of drought, but at all times

SECTION 2. Sec.37.101.1, subdivisions (a) through (d) shall be amended to read as follows:

"Sec. 37.101.1 Application

(a) The provisions of this article apply to any person in the use of any water provided by the City of Oceanside, except that the provisions of this ordinance do not apply to use of recycled water.

(b) This article is intended solely to further the conservation of water. It is not intended to implement any provision of Federal, State, or local statutes ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to chapter 40 of the Oceanside City Code or the Regional Water Quality Control Board for information on any urban runoff/stormwater ordinances or urban runoff/stormwater management plans.

(c) Nothing in this article is intended to affect or limit the ability of the City of Oceanside to declare and respond to an emergency, including an emergency that affects the ability of the City of Oceanside to supply water.

(d) Nothing in this article shall apply to use of water that is subject to a special supply program, such as the Water Authority Special Agricultural Water Rate program. Violations of the conditions of the special supply program is subject to the penalties established under the applicable program. A person using water subject to a special supply program

and other water provided by the City of Oceanside is subject to this ordinance in the use of other water.

SECTION 3. Sec.37.103, subdivision (c) shall be amended to read as follows:

"Sec. 37.103

"(c) Water users shall not let water leave the property by draining onto adjacent properties or public or private roadways for any reason. Spraying hard surfaces during irrigation activities is prohibited."

SECTION 4. Sec.37.105, subdivision (k) shall be amended by adding the following:

"Sec. 37.105 Definitions

(k) "Grower" refers to those engaged in the growing or raising in conformity with recognized practices of husbandry, for the purpose of commerce trade or industry, or for use by public educational or correctional institutions, of agricultural, horticultural or floricultural products, and produced (1) for human consumption or for the market, or (2) for the feeding of fowl or livestock produced for human consumption or for the market. *Grower* does not refer to customers who purchase water subject to the Water Authority Special Agricultural Rate program. All growers classified for agricultural use must be certified to meet the definition of Government Code section 51201, subdivision (b) and comply with the San Diego regional Agricultural Water Management Plan.

SECTION 5. Sec. 37.106, subdivisions (b) and (c) shall be amended to read as follows:

"Sec. 37.106. Conservation stages

(b) Drought Response Level 1 – Drought Watch Condition

1. A Drought Response Level 1 condition is also referred to as a "Drought Watch" condition. A Level 1 condition applies when the Water Authority notifies its member agencies that due to drought or other supply reductions, there is a reasonable probability there will be supply shortages and that a consumer demand reduction of up to 10 percent is required in order to ensure that sufficient supplies will be available to meet anticipated demands. The City of Oceanside never operates below a Level 1 condition in order to encourage water use efficiency and awareness.

2. During a Level 1 Drought Watch condition, the City of Oceanside actively promotes water efficiency through public education and outreach efforts to emphasize increased public awareness of the need to implement the following water conservation practices:

a. Stop washing down paved surfaces, including but not limited to sidewalks, driveways, parking lots, tennis courts, or patios, except when it is necessary to alleviate safety or sanitation hazards.

b. Stop water waste resulting from inefficient landscape irrigation, such as runoff, low head drainage, or overspray, etc. Similarly, stop water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways or structures.

c. Irrigate residential and commercial landscape before 10:00 a.m. and after 6:00 p.m. only.

d. Stop the application of potable water to driveways and sidewalks.

e . Use a hand-held hose equipped with a positive shut-off nozzle or bucket to water landscaped areas, including trees and shrubs located on residential and commercial properties that are not irrigated by a landscape irrigation system.

f. Irrigate nursery and commercial grower's products before 10:00 a.m. and after 6:00 p.m. only. Watering is permitted at any time with a hand-held hose equipped with a positive shut-off nozzle, a bucket, or when a drip/micro-irrigation system/equipment is used. Irrigation of nursery propagation beds is permitted at any time. Watering of livestock is permitted at any time. Use re-circulated water to operate ornamental fountains.

g. Use re-circulated water to operate ornamental fountains.

h. Wash vehicles using a bucket and a hand-held hose with positive shut-off nozzle, mobile high pressure/low volume wash system, or at a commercial site that re-circulates (reclaims) water on-site. Avoid washing during hot conditions when additional water is required due to evaporation.

i. Serve and refill water in restaurants and other food service establishments only upon request.

j. Offer guests in hotels, motels, and other commercial lodging establishments the option of not laundering towels and linens daily.

k. Repair all water leaks within five (5) days of notification by the City of Oceanside unless other arrangements are made with the water utilities director.

l. Use recycled or non-potable water for construction purposes when available

3. During a Drought Response Level 2 condition or higher, all persons shall be required to implement the conservation practices established in a Drought Response Level 1 condition.

(c) Drought Response Level 2 – Drought Alert Condition

1. A Drought Response Level 2 condition is also referred to as a "Drought Alert" condition. A level 2 condition applies when the Water Authority notifies its member agencies that due to cutbacks caused by drought or other reduction in supplies, a consumer demand reduction of up to twenty (20) percent is required in order to have sufficient supplies available to meet anticipated demands. The Oceanside City Council shall adopt a resolution declaring the existence of a Drought Response Level 2 condition and implementing the mandatory Level 2 conservation measures identified in this ordinance.

2. All persons using City of Oceanside water shall comply with Level 1 Drought Watch water conservation practices during a Level 2 Drought Alert, and shall also comply with the following additional conservation measures:

a. Limit residential and commercial landscape irrigation to no more than two (2) assigned days per week on a schedule established by the Water Utilities Director and posted by the City of Oceanside. This section shall not apply to commercial growers or nurseries unless under direct order by the Governor or by a State agency acting on his behalf.

b. Limit lawn watering and landscape irrigation using sprinklers to no more than ten (10) minutes per water station per assigned day. This provision does not apply to landscape irrigation systems using water efficient devices, including but not limited to: weather-based controllers, drip/micro/irrigation systems or stream rotor sprinklers.

c. Water landscaped areas, including trees and shrubs located on residential and commercial properties, and not irrigated by a landscape irrigation system governed by subsection 37.106(c)2.a., on the same schedule set forth in subsection 37.106(c)2.a. by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation

d. Stop irrigation with potable water of ornamental turf on public street medians when under direct order by the Governor, or by a State agency acting on his behalf.

e. Repair all leaks immediately upon notification by the City of Oceanside unless other arrangements are made with the Water Utilities Director.

f. Stop operating ornamental fountains or similar decorative water features unless recirculated water is used.

g. Stop all watering during and forty-eight (48) hours after measureable precipitation.

h. Stop irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development when under direct order by the Governor or by a State agency acting on his behalf.

SECTION 6. Severability.

If any section, sentence, clause or phrase of the Ordinance is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance. The City Council hereby declares that it would have adopted this Ordinance and each section, sentence, clause or phrase thereof, irrespective of the fact that any one or more section, subsections, sentences, clauses or phrases be declared invalid or unconstitutional.

Section 7. Effective Date.

This ordinance shall be effective immediately upon its adoption by 4/5ths vote of the City Council in accordance with Government Code section 36937.

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INTRODUCED AND ADOPTED at a regular meeting of the City Council of the City of Oceanside held on the 20th day of May, 2015,

by the following vote:

AYES: WOOD, FELLER, KERN, LOWERY, SANCHEZ
NAYS: NONE
ABSENT: NONE
ABSTAIN: NONE

MAYOR, CITY OF OCEANSIDE

ATTEST:

CITY CLERK

APPROVED AS TO FORM:

CITY ATTORNEY

AN URGENCY ORDINANCE OF THE CITY OF OCEANSIDE AMENDING OCEANSIDE CITY CODE, CHAPTER 37, REVISING AND UPDATING THE WATER CONSERVATION PROGRAM AND THE DROUGHT RESPONSE CONSERVATION MEASURES

Appendix F - Water Efficient Landscape Ordinance

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ORDINANCE NO. **10-OR0412-1**

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF OCEANSIDE, CALIFORNIA, AMENDING CHAPTER 37 OF THE OCEANSIDE CITY CODE BY ADDING A NEW ARTICLE VII PERTAINING TO WATER EFFICIENT LANDSCAPING

WHEREAS, Government Code section 65595 requires local agencies to adopt a water efficient landscape ordinance that is at least as effective in conserving water as the updated model ordinance described in subsection (a) of said Government Code section.

Now, THEREFORE, the City Council of the City of Oceanside does ordain as follows:

SECTION 1. Chapter 37 of the Oceanside City Code is hereby amended by adding a new Article VII, as follows:

ARTICLE VII. WATER EFFICIENT LANDSCAPE REGULATIONS

SEC. 37.114. Purpose.

The State Legislature determined in the Water Conservation in Landscaping Act (the "Act"), Government Code sections 65591 et seq., that the State's water resources are in limited supply. The Legislature also recognized that while landscaping is essential to the quality of life in California, landscape design, installation, maintenance and management must be water efficient. The general purpose of this Article is to establish water use standards for landscaping in the City of Oceanside that implement the 2006 development landscape design requirements established by the Act. Consistent with the Legislature's findings, the purpose of this ordinance is to:

(a) Promote the values and benefits of landscapes while recognizing the need to utilize water and other resources as efficiently as possible.

(b) Establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction.

(c) Promote the use, when available, of tertiary treated recycled water, for irrigating landscaping.

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

(e) Encourage water users of existing landscapes to use water efficiently and without waste.

SEC. 37.115. Findings.

This Article implements the Water Conservation in Landscaping Act. The requirements of this Article reduce water use associated with irrigation of outdoor landscaping by setting a maximum amount of water to be applied to landscaping and by designing, installing and maintaining water efficient landscapes consistent with the water allowance. The provisions of this ordinance are equivalent to and at least as effective as the provisions of the state Model Water Efficient Landscape Ordinance because the calculation of MAWA and the resulting restrictions on irrigation and process are similar, though tailored to the City of Oceanside's existing regulatory procedures.

SEC. 37.116. Definitions.

The following definitions shall apply to this Article:

(a) "Automatic irrigation controller" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers shall schedule irrigation events using either evapotranspiration (ETo) (weather-based) or moisture sensor data.

(b) "Building permit" means a permit to engage in a certain type of construction on a specific location.

(c) Certified landscape irrigation auditor means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other accredited certification program.

(d) "Developer" means a person who seeks or receives permits for or who undertakes land development activities' who is not a single-family homeowner. Developer includes a developer's partner, associate, employee, consultant, trustee or agent.

(e) "Director" means the person designated by the City Manager to direct the activities of the Development Services Department including planning, building, and engineering services or anyone to whom the Director has designated or hired to administer or enforce this Article.

(f) "Discretionary permit" means any permit requiring a decision making body to exercise judgment prior to its approval, conditional approval or denial.

(g) "Estimated total water use" (ETWU) means the estimated total water use in gallons per year for a landscaped area.

(h) "ET adjustment factor" (ETAF) means a factor that when applied to reference ETo, adjusts for plant water requirements and irrigation efficiency, two major influences on the amount of water that is required for a healthy landscape.

(i) "Evapotranspiration" (ETo) means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time period. "Reference evapotranspiration" means a standard measurement of environmental parameters which affect the water use of plants. ETo is given in inches per day, month, or year and is an estimate of the ETo of a large field of four-inches to seven-inches tall, cool season turf that is well watered. Reference ETo is used as the basis of determining the MAWA so that regional differences in climate can be accommodated.

(j) "Grading" means any importation, excavation, movement, loosening or compaction of soil or rock.

(k) "Hardscape" means any durable surface material, pervious or non-pervious.

(l) "Homeowner-provided landscaping" means landscaping installed either by a private individual for a single-family residence or installed by a licensed contractor hired by a homeowner.

(m) "Hydrozone" means a portion of the landscape area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

(n) "Invasive species" means species of plants not historically found in California that spread outside cultivated areas and may damage environmental or economic resources.

(o) "Irrigation audit" means an inspection which includes an in depth evaluation of the performance of an irrigation system conducted by a certified landscape irrigation auditor. An irrigation audit may include, but is not limited to, inspection, system tune up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow and preparation of an irrigation schedule.

(p) "Irrigation efficiency" means the measurement of the amount of water beneficially used divided by the water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices.

(q) "Landscaped area" means an area with outdoor plants, turf and other vegetation. A landscaped area includes a water feature either in an area with vegetation or that stands alone. A landscaped area may also include design features adjacent to an area with vegetation when allowed under Section 37.128. A landscaped area does not include the footprint of a building, decks, patio, sidewalk, driveway, parking lot or other hardscape that does not meet the criteria in Section 37.128. A landscaped area also does not include an area without irrigation designated for non-development such as designated open space or area with existing native vegetation.

(r) "Landscape Design Manual" means the manual, approved by the City of Oceanside that establishes specific design criteria and guidance to implement the requirements of this Article.

(s) "Landscape Development Manual" means the manual, approved by the City of Oceanside that establishes specific design criteria, guidance, and construction details to implement the requirements of this Article and development within the City of Oceanside.

(t) "Licensed" means licensed by the State of California

(u) "Low *he*ad drainage" means a sprinkler head or other irrigation device that continues to emit water after the water to the zone in which the device is located has shut off.

(v) "Low volume irrigation" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low volume emitters such as drip lines or bubblers.

(w) "Mass grading" means the movement of soil per the grading ordinance.

(x) "Maximum Applied Water Allowance" (MAWA) means the maximum allowed annual water use for a specific landscaped area based on the square footage of the area, the ETAF and the reference ETo.

(y) "Mulch" means an organic material such as leaves, bark, straw or inorganic mineral materials such as rocks, gravel or decomposed granite left loose and applied to the soil surface to reduce evaporation, suppress weeds, moderate soil temperature or prevent soil erosion.

(z) "Overspray" means the water from irrigation that is delivered outside an area targeted for the irrigation and makes contact with a surface not intended to be irrigated.

(aa) "Pervious" means any surface or material that allows the passage of water through the material and into underlying soil.

(bb) "Plant factor" means a factor when multiplied by the ETo, estimates the amount of water a plant needs.

(cc) "Public water purveyor" means a public utility, municipal water district, municipal irrigation district or municipality that delivers water to customers.

(dd) "Recycled water" means waste water that has been treated at the highest level required by the California Department of Health Services for water not intended for human consumption. "Tertiary treated recycled water," means water that has been through three levels of treatment including filtration and disinfection.

(ee) "Runoff" means water that is not absorbed by the soil or landscape to which it is applied and flows from the landscaped area.

(ff) "Special landscaped area" means an area of the landscape dedicated to edible plants, an area irrigated with recycled water, or an area dedicated as turf area within a park, sports field or golf course where turf provides a passive or active recreational surface.

(gg) "Subsurface irrigation" means an irrigation device with a delivery line and water emitters installed below the soil surface that slowly and frequently emit small amounts of water into the soil to irrigate plant roots.

(hh) "Transitional area" means a portion of a landscaped area that is adjacent to a natural or undisturbed area and is designated to ensure that the natural area remains unaffected by plantings and irrigation installed on the property.

(ii) "Turf" means a groundcover surface of mowed grass.

(jj) "Water feature" means a design element where open water performs an aesthetic or recreational function. A water feature includes a pond, lake, waterfall, fountain, artificial streams, spa and swimming pool. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices are not water features.

(kk) "WUCOLS III" means Water Use Classification of Landscape Species and refers to the Department of Water Resources 1999 publication or the most current version.

SEC. 37.117. Applicability.

(a) This Article shall apply to the following projects which require a building permit or a discretionary permit:

(1) A project for an industrial, commercial, institutional, or multi-family residential use where the landscaped area is greater than or equal to 2,500 square feet.

(2) Developer installed residential and common area landscapes where the total landscaped area for the development is greater than or equal to 2,500 square feet.

(3) A new single-family residence with homeowner provided landscaping where the landscaped area is greater than or equal to 5,000 square feet.

(4) A model home that includes a landscaped area greater than or equal to 2,500 square feet.

(5) A public agency project that contains a landscaped area 2,500 square feet or more.

(6) A rehabilitated landscape for an existing industrial, commercial, institutional, public agency, or multifamily use where a building permit or discretionary permit is being issued and the applicant is installing or modifying 2,500 square feet or more of landscaping.

(7) A cemetery under limited requirements in Section 37.130.

(8) A new single-family residence with homeowner provided landscaping, where the landscape area is less than 5,000 square feet, under limited requirements in Section 37.129.

(b) This Article shall not apply to the following:

(1) A registered local, State or federal historical site.

(2) An ecological restoration project that does not require a permanent irrigation system.

(3) A mined land reclamation project that does not require a permanent irrigation system.

(4) A botanical garden or arboretum, open to the public.

(5) Any single-family residence that is being rebuilt after it was destroyed due to a natural disaster, such as a fire, earthquake, hurricane or tornado.

SEC. 37.118. Landscape Approval – Project Entitlement Phase

(a) No person shall install landscaping for a project subject to this Article without the review and approval required by this Article.

(b) A person constructing a project subject to the requirements of this Article shall obtain approval for the landscaped area as follows:

(1) A person applying for a building permit for a single-family residence shall obtain an approval of the landscaping from the City of Oceanside as part of the permitting process.

(2) A person applying for a discretionary permit described in section 37.117:

(i) Shall submit a landscape concept plan as required by the discretionary permit application. The concept plan shall include representation of the site features, proposed planting areas and the proposed method and type of irrigation.

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(ii) Shall obtain approval for landscaping as part of the permitting process for each building permit for each project segment that requires installation of a water meter or connection to an existing water meter.

(iii) May use "typical" plans for Developer-installed landscaping for Single-family homes.

SEC. 37.119. Administration, Landscape Design and Development Manual.

(a) The Director shall administer and enforce this Article.

(b) The Director shall prepare a landscape design manual or may designate the current County of San Diego Landscape Design Manual as the City of Oceanside's Landscape Design Manual to provide guidance to applicants on how to comply with the requirements of this Article.

(c) The Director shall enforce the construction and installation of landscape items to be subject to the City of Oceanside guidelines and specifications for landscape development and in accordance with the current Landscape Development Manual.

SEC. 37.120. Landscape Documentation Package – Final Landscape Improvement Plans.

(a) Except as provided in subsection (b), building permit applications for projects subject to Section 37.117 shall include a landscape documentation package that complies with the provisions of this Article, with the Landscape Design Manual and the current City of Oceanside Landscape Development Manual.

(b) An applicant for a building permit for a single family residence with a landscaped area less than 5,000 square feet is not required to submit a landscape documentation package with the permit application, but shall comply with Section 37.129. An applicant for a permit for a cemetery is not required to submit a landscape documentation package, but shall comply with Section 37.130.

(c) The landscape documentation package required by subsection (a) shall contain the following:

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(1) A soil management report and plan that complies with Section 37.121 that analyzes the soil within each landscaped area of the project and makes recommendations regarding soil additives.

(2) Planting and irrigation plans that comply with Section 37.122 that describe the landscaping and irrigation for the project.

(3) A water efficient landscape worksheet that complies with Section 37.123 that calculates the MAWA and the ETWU for the project.

(4) A grading design plan that complies with Section 37.124 that describes the grading of the project. If the project applicant has submitted a grading plan with the application for the project, the Director may accept that grading plan in lieu of the grading design plan required by this subsection if the grading plan complies with Section 37.124.

SEC. 37.121. Soil Management Report

(a) The soil management report required by Section 37.120 shall be prepared by a licensed landscape architect, licensed civil engineer, licensed architect, or other landscape professional licensed by the state to do this work and shall contain the following information:

(1) An analysis of the soil for the proposed landscaped areas of the project that includes information about the soil texture, soil infiltration rate, pH, total soluble salts, sodium, and percent organic matter.

(2) Recommendations about soil amendments that may be necessary to foster plant growth and plant survival in the landscaped area using efficient irrigation techniques.

(b) When a project involves mass grading of a site the applicant shall submit the soil management report that complies with subsection (a) above with the certificate of completion required by Section 37.136.

(c) The soil management report shall include information regarding proposed soil amendments and mulch:

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(1) The report shall identify the type and amount of mulch for each area where mulch is applied. Mulch shall be used as follows:

(i) A minimum three-inch layer of mulch shall be applied on all exposed soil surfaces in each landscaped area except in turf areas, creeping or rooting ground covers or direct seeding applications where mulch is contraindicated.

(ii) Stabilizing mulch shall be applied on slopes.

(iii) The mulching portion of seed/mulch slurry in hydro-seeded applications shall comply with subsection (a) above.

(iv) Highly flammable mulch material shall not be used.

(2) The report shall identify any soil amendments and their type and quantity.

SEC. 37.122. Planting and Irrigation Plans

(a) The planting and irrigation plans required by Section 37.120 shall be prepared by a licensed landscape architect, or other professional licensed by the state to do this work. The plans shall:

(1) Include the MAWA for the plans, including the calculations used to determine the MAWA. The calculations shall be based on the formula in Section 37.126.

(2) Include the ETWU for the plans, including the calculations used to determine the ETWU. The calculations shall be based on the formula in Section 37.127.

(3) Include a statement signed under penalty of perjury by the person who prepared the plan that provides, "I am familiar with the requirements for landscape and irrigation plans contained in the City of Oceanside's Water Efficient Landscape Regulations. I have prepared this plan in compliance with those regulations, the Landscape Design Manual and the current City of Oceanside Landscape Development Manual. I certify that the plan implements those regulations to provide efficient use of water."

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(4) Demonstrate compliance with best management practices required by *Watershed Protection, Stormwater Management and Discharge Control regulations*.

(5) Address fire safety issues and demonstrate compliance with applicable requirements for defensible space around buildings and structures and shall avoid the use of fire prone vegetation.

(b) The planting plan shall meet the following requirements:

(1) The plan shall include a list of all vegetation by common and botanical plant name, which exists in the proposed landscaped area. The plan shall state what vegetation will be retained and what will be removed.

(2) The plan shall include a list of all vegetation by common and botanical plant name, which will be added to each landscaped area. No invasive plant species shall be added to a landscaped area. The plan shall include the total quantities by container size and species. If the applicant intends to plant seeds, the plan shall describe the seed mixes, applicable purity, germination specifications, slurry mix specification and tackifier information.

(3) The plan shall include a detailed description of each water feature that will be included in the landscaped area.

(4) The plan shall be accompanied by a drawing showing on a page or pages, the specific location of all vegetation, retained or planted, the plant spacing and plant size, natural features, water features, and hardscape areas. The drawing shall include a legend listing the common and botanical plant name of each plant shown on the drawing.

(5) All plants shall be grouped in hydrozones and the irrigation shall be designed to deliver water to hydrozones based on the moisture requirements of the plant grouping. A hydrozone may mix plants of moderate and low water use or mix plants of high water use with plants of moderate water use. No high water

use plants shall be allowed in a low water use hydrozone. The plan shall also demonstrate how the plant groupings accomplish the most efficient use of water.

(6) The plan shall identify areas permanently and solely dedicated to edible plants.

(7) The plan shall demonstrate that landscaping when installed and at maturity will be positioned to avoid obstructing motorists' views of pedestrian crossings, driveways, roadways and other vehicular travel ways. If the landscaping will require maintenance to avoid obstructing motorist's views, the plan shall describe the maintenance and the frequency of the proposed maintenance.

(8) The plan shall avoid the use of landscaping with known surface root problems adjacent to a paved area, unless the plan provides for installation of root control barriers or other appropriate devices to control surface roots.

(9) Plants in a transitional area shall consist of a combination of site adaptive and compatible native and/or non-native species. No invasive species shall be introduced or tolerated in a transitional area. The irrigation in a transitional area shall be designed so that no overspray or runoff shall enter an adjacent area that is not irrigated.

(10) On a project other than a single-family residence, the plan shall identify passive and active recreational areas.

(c) The Irrigation Plan shall meet the following requirements:

(1) The plan shall show the location, type and size of all components of the irrigation system that will provide water to the landscaped area, including the controller, water lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices.

(2) The plan shall show the static water pressure at the point of connection to the public water supply and the flow rate in gallons, the application rate in inches per hour and the design operating pressure in pressure per square inch for each station.

(3) The irrigation system shall be designed to prevent runoff, overspray, low-head drainage and other similar conditions where irrigation water flows or sprays onto areas not intended for irrigation. The plan shall also demonstrate how grading and drainage techniques promote healthy plant growth and prevent erosion and runoff.

(4) The plan shall identify each area irrigated with recycled water.

(5) The plan shall provide that any slope greater than 25 percent will be irrigated with an irrigation system with a precipitation rate of .75 inches per hour or less to prevent runoff and erosion. As used in this Article, 25 percent grade means one foot of vertical elevation change for every four feet of horizontal length. An applicant may employ an alternative design if the plan demonstrates that no runoff or erosion will occur.

(6) The plan shall provide that all wiring and piping under a paved area that a vehicle may use, such as a parking area, driveway or roadway, will be installed inside a PVC conduit.

(7) The plan shall provide that irrigation piping and irrigation devices that deliver water, such as sprinkler heads, shall be installed below grade if they are within 24 inches of a vehicle or pedestrian use area. The Director may allow on-grade piping where landform constraints make below grade piping infeasible.

(8) The plan shall provide that only low volume or subsurface irrigation shall be used to irrigate any vegetation within 24 inches of an impermeable surface unless the adjacent impermeable surfaces are designed and constructed to cause water to drain entirely into a landscaped area.

(9) The irrigation system shall provide for the installation of a manual shutoff valve as close as possible to the water supply. Additional manual shutoff valves shall be installed between each zone of the irrigation system and the water supply.

(10) The irrigation system shall provide that irrigation for any landscaped area will be regulated by an automatic irrigation controller.

(11) The irrigation system shall be designed with a landscape irrigation efficiency necessary to meet the MAWA.

(12) The plan shall describe each automatic irrigation controller the system uses to regulate the irrigation schedule and whether it is a weather based system or moisture detection system. The plan shall depict the location of electrical service for the automatic irrigation controller or describe the use of batteries or solar power that will power valves or a smart controller.

SEC. 37.123. Water Efficient Landscape Worksheet

The water efficient landscape worksheet required by Section 37.120 shall be prepared by a licensed landscape architect, or other professional licensed by the state to do this work and shall contain the following:

(a) A hydrozone information table that contains a list of each hydrozone in the landscaped area of the project and complies with the following requirements:

(1) For each hydrozone listed, the table shall identify the plant types and water features in the hydrozone, the irrigation methods used, the square footage and the percentage of the total landscaped area of the project that the hydrozone represents.

(2) The plant types shall be categorized as turf, high water use, moderate water use or low water use.

(b) Water budget calculations, which shall meet the following requirements:

(1) The plant factor used shall be from WUCOLS III. The plant factor shall be 0.1 for very low water use plants 0.3 for low water use plants, 0.5 for moderate water use plants and 0.8 for high water use plants. A plan that mixes plants in a hydrozone that require a different amount of water shall use the plant factor for the highest water using plant in the hydrozone.

(2) Temporarily irrigated areas shall be included in the low water use hydrozone. Temporarily irrigated as used in this Article means the period of time when plantings only receive water until they become established.

(3) The surface area of a water feature, including swimming pools, shall be included in a high water use hydrozone.

(4) The calculations shall use the formula for the MAWA in Section 37.126 and for the ETWU in Section 37.127.

(5) Each special landscaped area shall be identified on the worksheet and the area's water use calculated using an ETAF of 1.0.

SEC. 37.124. Grading Design Plan

The grading design plan required by Section 37.120 shall be prepared by a California licensed civil engineer, or other professional licensed by the state to do this work and shall comply with the following requirements:

(a) The grading on the project site shall be designed for the efficient use of water by minimizing soil erosion, runoff and water waste, resulting from precipitation and irrigation.

(b) The plan shall show the finished configurations and elevations of each landscaped area including the height of graded slopes, the drainage pattern, pad elevations, finish grade and any stormwater retention improvements.

SEC. 37.125. Irrigation Schedule

The irrigation schedule required by Section 37.120, shall be prepared by a licensed landscape architect, or other professional licensed by the state to do this work and provide the following information:

(a) A description of the automatic irrigation system that will be used for the project.

(b) The ETo data relied on to develop the irrigation schedule, including the source of the data.

(c) The time period when overhead irrigation will be scheduled and confirm that no overhead irrigation shall be used between 10:00 a.m. and 6:00 p.m.

(d) The parameters used for setting the irrigation system controller for watering times for:

(1) The plant establishment period.

(2) Established landscaping.

(3) Temporarily irrigated areas.

(4) Different seasons during the year.

(e) The consideration used for each station for the following factors:

(1) The days between irrigation.

(2) Station run time in minutes for each irrigation event, designed to avoid runoff.

(3) Number of cycle starts required for each irrigation event, designed to avoid runoff.

(4) Amount of water to be applied on a monthly basis.

(5) The root depth setting.

(6) The plant type setting.

(7) The soil type.

(8) The slope factor.

(9) The shade factor.

SEC. 37.126. Maximum Applied Water Use

(a) A landscape project subject to this Article shall not exceed the MAWA. The MAWA for a landscape project shall be determined by the following calculation:

MAWA = (ETo)(0.62)[0.7 x LA + 0.3 x SLA]

(b) The abbreviations used in the equation have the following meanings:

(1) MAWA = Maximum Applied Water Allowance in gallons per year.

(2) ETo = Evapotranspiration in inches per year.

(3) 0.62 = Conversion factor to gallons per square foot.

(4) 0.7= ET adjustment factor for plant factors and irrigation efficiency.

(5) LA = Landscaped area includes special landscaped area in square feet.

(6) 0.3 = the additional ET adjustment factor for a special landscaped area (1.0 - 0.7 = 0.3)

(7) SLA = Portion of the landscaped area identified as a special landscaped area in square feet.

SEC. 37.127. Estimated Total Water Use

(a) An applicant for a project subject to this Article shall calculate the ETWU for each landscaped area and the entire project using the following equation:

(1) ETWU = (ETo)(0.62)(PF x HA / IE + SLA)

(b) The abbreviations used in the equation have the following meanings:

(1) ETWU = Estimated total water use in gallons per year.

(2) ETo = Evapotranspiration in inches per year.

(3) 0.62 = Conversion factor to gallons per square foot.

(4) PF = Plant factor from WUCOLS

(5) HA = Hydrozone Area in square feet. Each HA shall be classified based upon the data included in the landscape and irrigation plan as high, medium or low water use.

(6) IE = Irrigation Efficiency of the irrigation method used in the hydrozone.

(7) SLA = Special landscaped area in square feet.

(c) The ETWU for a proposed project shall not exceed the MAWA.

SEC. 37.128. Adjustment to Landscaped Area For Non-Vegetated Area

Rock and stone or pervious design features, such as decomposed granite ground cover that are adjacent to a vegetated area may be included in the calculation of the MAWA and ETWU provided the features are integrated into the design of the landscape area and the primary purpose of the feature is decorative.

SEC. 37.129. New Single Family Residential Projects With Limited Landscaping

An applicant for a building permit for a new single-family residence subject to this Article where the landscaped area of the project is less than 5,000 square feet shall, as a condition of obtaining a building permit, submit an application (short form) to establish a MAWA and/or a best landscape design practices checklist for the property on the form approved by the Director.

SEC. 37.130. Cemeteries

(a) A person submitting an application for a cemetery shall include the following:

(1) A concept plan, as described in Section 37.118.

(2) A water efficient irrigation worksheet that calculated the MAWA for the project with the application that complies with Section 37.123.

(3) A landscape irrigation and maintenance schedule that complies with Section 37.135.

SEC. 37.131. Regulations Applicable to Use of Turf on Landscaped Areas

The following regulations shall apply to the use of turf on a project subject to this Article:

(a) Only low volume or subsurface irrigation shall be used for turf in a landscaped area:

(1) On a slope greater than 25 percent grade where the toe of the slope is adjacent to an impermeable hardscape.

(2) Where any dimension of the landscaped area is less than six feet wide.

(b) On a commercial, industrial, institutional or multi-family project, no turf shall be allowed on a center island median strip or on a parking lot island.

(c) A ball field, park, golf course, cemetery and other similar use shall be designed to limit turf in any portion of a landscaped area not essential for the operation of the facility.

(d) No turf shall be allowed in a landscaped area that cannot be efficiently irrigated, such as avoiding runoff or overspray.

SEC. 37.132. Projects With Model Homes

A person who obtains a permit to construct a single-family residential development that contains a model home or homes shall provide a summary of this Article to each adult visitor who visits a model home. If an adult visitor is accompanied by one or more adults during the visit, only one set of written materials is required to be provided. Each model home shall provide an educational sign in the front yard of the model home visible and readable from the roadway that the home faces that states in capital black lettering at least two inches high on a white sign, "THIS MODEL HOME USES WATER EFFICIENT LANDSCAPING AND IRRIGATION."

SEC.37.133. Recycled Water

(a) A person who obtains a permit for a project that is subject to this Article shall use recycled water for irrigation when tertiary treated recycled water is available from the water purveyor who supplies water to the property for which the City of Oceanside issues a permit.

(b) A person using recycled water shall install a dual distribution system for water received from a public water purveyor. Pipes carrying recycled water shall be purple.

(c) A person who uses recycled water under this section shall be entitled to an ETAF of 1.0.

(d) This section does not excuse a person using recycled water from complying with all State and local laws and regulations related to recycled water use.

SEC. 37.134. Landscaping and Irrigation Installation

A person issued a landscape approval for a project, other than a single-family residence where the landscaped area of the project is less than 5,000 square feet, shall install the approved landscaping and irrigation system before final inspection of the project.

SEC. 37.135. Landscaping and Irrigation Maintenance

(a) A property owner using water on property subject to a landscape approval other than a single-family residence with a total landscaped area less than 5,000 square feet, shall prepare a maintenance schedule for the landscaping and irrigation system on the project. The schedule shall provide for (1) routine inspection to guard against runoff and erosion and to detect plant or irrigation system failure, (2) replacement of dead, dying and diseased vegetation, (3) eradication of invasive species, (4) repairing the irrigation system and its components, (5) replenishing mulch, (6) soil amendment when necessary to support and maintain healthy plant growth, (7) fertilizing, pruning and weeding and maintaining turf areas, and (8) maintenance to avoid obstruction of motorists' view. The schedule shall also identify who will be responsible for maintenance.

(b) After approval of a landscape plan, the owner is required to:

(1) Maintain and operate the landscaping and irrigation system on the property consistent with the MAWA.

(2) Maintain the irrigation system to meet or exceed an irrigation efficiency necessary to meet MAWA.

(3) Replace broken or malfunctioning irrigation system components with components of the same materials and specifications, their equivalent or better.

(4) Ensure that when vegetation is replaced, replacement plantings are representative of the hydrozone in which the plants were removed and are typical of the water use requirements of the plants removed, provided that the replaced vegetation does not result in mixing high water use plants with low water use plants in the same hydrozone.

SEC. 37.136. Certificate of Completion

Prior to receiving final approval for completion of the project, each applicant, other than for a single family residence with a total landscaped area less than 5,000 square feet, shall submit a signed certificate of completion and final documentation for the project under penalty of perjury within 10 days after installation.

(a) The certificate of completion shall:

(1) Be submitted on a form provided by the City of Oceanside.

(2) Include a statement verifying that the landscaping and irrigation were installed as allowed in the approved landscape and irrigation plan, all approved soil amendments were implemented, the installed irrigation system is functioning as designed and approved, the irrigation control system was properly programmed in accordance with the irrigation schedule, and the person operating the system has received all required maintenance and irrigation plans, and

(3) Be signed by the professional of record for the landscape design.

(b) The final submittal shall include:

(1) Irrigation schedule that complies with Section 37.125, that describes the irrigation times and water usage for the project

(2) A landscaping and irrigation system maintenance schedule that complies with Section 37.135, and

(3) A soil management report that complies with Section 37.121, if the applicant did not submit the report with the landscape documentation package.

(4) Final "as built" plans, submitted by the professional of record, where there have been significant changes to the landscape plan during the installation of landscaping or irrigation devices or irrigation system components.

SEC. 37.137. Waste Water Prevention

(a) No person shall use water for irrigation that due to runoff, low head drainage, overspray or other similar condition, water flows onto adjacent property, non-irrigated areas, structures, walkways, roadways or other paved areas.

(b) No person whose landscape is subject to a landscape approval pursuant to this Article shall apply water to the landscape in excess of the MAWA.

SEC. 37.138. Enforcement

(a) The City Manager shall administer and enforce the provisions of this Article. Any City authorized personnel or enforcement officer may exercise any enforcement powers as set forth in the Code.

(b) The City may delegate to or enter into a contract with a local agency or other person to implement and administer any of the provisions of this Article on behalf of the City.

SEC. 37.139. Fees

An applicant for a project subject to this Article shall include with the application, all fees established by the City of Oceanside to cover the City of Oceanside's cost to review an application, any required landscape documentation package and any other documents the City of Oceanside reviews pursuant to the requirements of this Article.

SECTION 2. If any section, sentence, clause or phrase of this Article is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Article.

The City Council hereby declares that it would have passed this ordinance and adopted this Article and each section, sentence, clause or phrase thereof, irrespective of the fact that any

one or more sections, subsections, sentences, clauses or phrases be declared invalid or unconstitutional.

SECTION 3. The City Clerk of the City of Oceanside is hereby directed to publish this ordinance, or the title hereof as a summary, pursuant to state statute, once within fifteen (15) days after its passage in the North County Times, a newspaper of general circulation published in the City of Oceanside.

SECTION 4. This ordinance shall take effect and be in force on the thirtieth (30th) day from and after its final passage.

INTRODUCED at a regular meeting of the City Council of the City of Oceanside, California held on the 21st day of April, 2010, and thereafter,

PASSED AND ADOPTED by the City Council of the City of Oceanside, California, this 26th day of May, 2010, by the following vote:

AYES: WOOD, FELLER, KERN, SANCHEZ
NAYS: NONE
ABSENT: NONE
ABSTAIN: NONE

MAYOR OF THE CITY OF OCEANSIDE

ATTEST:

CITY CLERK

APPROVED AS TO FORM:

CITY ATTORNEY

Appendix G - Recycled Water Ordinance

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ORDINANCE NO. 14-OR0565-1

AN ORDINANCE OF THE CITY OF OCEANSIDE AMENDING CHAPTER 37 OF THE OCEANSIDE CITY CODE BY DELETING SUBSECTION 37.102(d) AND ADDING ARTICLE VIII, RECYCLED WATER

WHEREAS, the City Council has determined the necessity of establishing general regulations for the installation and connection of service, cross connection control program, meters, mains and main extensions for the recycled water system within the City of Oceanside; and

WHEREAS, the City Council has determined that such regulations provide for the protection and maximum beneficial public use of the City's recycled water system.

WHEREAS, on March 27, 1991, the City Council approved Ordinance No. 91-15 related to water conservation;

WHEREAS, Ordinance No. 91-15, Section 37.102 (d) does not comply with current requirements;

NOW, THEREFORE, the City Council of the City of Oceanside DOES ORDAIN as follows:

SECTION 1. Subsection (d) of Section 37.102 of the Oceanside City Code is hereby deleted.

SECTION 2. Article VIII is hereby added to Chapter 37 of the Oceanside City Code and shall read as follows:

"ARTICLE VIII. RECYCLED WATER"

Section 37.140 Intent and Purpose.

It is the intent of this Article to promote the conservation and establish regulations for the installation and connection of service, cross connection control program, meters, mains and main extensions for the recycled water system within the City. The City Council, in enacting the ordinance codified in this article, intends to provide for the protection and maximum beneficial public use of the City's recycled water system, to enable the proper installations of

the recycled water system, to ensure the correct uses of the recycled water within the City, and to promote public health and safety.

The City shall provide recycled water wherever the City determines its use is economically and technically feasible and consistent with the City's Recycled Water Master Plan, developed to meet the projected economic, regulatory and facility needs of the City's recycled program.

Section 37.141 Definitions.

As used in this Article, the following terms are defined in this section.

"Administrative Authority" means the director of the Water Utilities Department or his or her designated representative.

"Applicant" means any person or entity that may request recycled water service.

"Authorized Enforcement Officials" means the Water Utilities Director of the Water Utilities Department or his or her designated representative.

"Authorized Enforcement Staff" means any city employee supervised by an authorized enforcement official, assigned to duties involving permits and other city approvals, inspections, and enforcement related to this chapter.

"Authorized Inspector" means the director of the Water Utilities Department or his or her designated representative.

"*Customer*" means any person to whom the City supplies recycled water service under contract, either expressed or implied, to make payment therefor.

"*Delivery Charge*" means the minimum monthly charge to a customer for the availability of service, the revenue from which enables the City to maintain and operate the recycled water system ready to deliver to a customer. The delivery charge shall be based on the size of the water meter that is appropriate to provide service for the customer.

"*Design Manual*" means the latest edition of the City of Oceanside's Water, Sewer and Recycled Water Design and Construction Manual adopted by Resolution 04-R940-1.

"*Dwelling Unit*" is one (1) or more habitable rooms which are occupied or which are intended or designed to be occupied by one (1) or more individuals with facilities for living,

sleeping, cooking, and eating and includes a mobile home and manufactured home.

"*Extension*" means recycled water pipeline extension.

"*Grey Water*" means untreated waste water which has not come into contact with toilet waste. Grey water includes waste water from bathtubs, showers, bathroom wash basins, clothes washing machines, and laundry tubs.

"*Industrial or Commercial*" means any customer using recycled water for landscape irrigation on the site that is not a residential unit, but used for the purpose of producing either goods or services.

"*Landscape Impoundment*" means a body of water used for aesthetic or irrigation purposes and not intended for public contact or ingestion, which may contain recycled water.

"*Meter*" means a device to measure the amount of recycled water the customer uses in units, where one unit is 748 gallons.

"*Pipeline*" means an existing or proposed recycled water pipeline in the recycled water distribution system.

"*Off-Site Recycled Water Facilities*" means facilities under the control of the City generally located between the supply main and the recycled water meter.

"*On-Site Recycled Water Facilities*" means the customer-operated portion of the recycled water system located within private property, between the recycled water meter and the point of use.

"*Recycled Water,*" sometimes referred to as reclaimed water, means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and also meets the highest level of conformance with California Code of Regulations, Title 22, Division 4, Chapter 3 (use of recycled water for irrigation and for impoundments), currently section 60304 and section 60305. The meaning of recycled water in this definition does not include grey water.

"*Recycled Water Connection Fee*" means the fee paid for the planning, design and construction of capacity improvements and/or new facilities required for the delivery, distribution and storage or recycled water.

"*Water Utilities Director*" shall mean the person designated by the City Manager to have charge of the administration and supervision of the Water Utilities Department and such other duties as the City Manager may prescribe.

Section 37.142 Recycled Water Mains

All new commercial, industrial, multi-family and residential developments of four (4) units or more are required to install a dual recycled water system for the purposes of irrigation of landscape and all common areas.

A. All new and extensions to recycled water mains shall be a minimum of six inches in diameter.

B. All sub-dividers shall be required to install recycled water pipelines within the property subdivision and extend this system to the external limits of the subdivision, or to the nearest recycled water main if one exists within a maximum of seventy-five (75) feet.

C. All off-site recycled water facilities and services shall be planned, designed and installed in accordance with the City's design manual and all applicable federal, state and local laws.

D. All services shall be metered with meters purchased from the City and installed by a City-approved contractor at developers' expense.

E. The City's ownership and maintenance responsibilities shall terminate at the valve on the customer's side of the meter assembly.

All plans and necessary specifications associated with the installation or extension of new recycled water mains within the City must be submitted to the Administrative Authority for review and approval prior to such installation or extension.

Section 37.143 Determination of Feasible and Authorized Uses

The uses of recycled water may include but are not limited to, landscape irrigation, agricultural irrigation, natural treatment system irrigation, construction water, industrial process water, cooling tower makeup water, water for flushing toilets and urinals, trap primers in dual-plumbed buildings, and public and private recreational impoundment. The Administrative Authority is authorized to consider on a case-by-case basis each use for approval by the City,

and the Administrative Authority may determine in its discretion whether it is feasible to furnish recycled water for the specific use involved. Prior to approving such uses, the Administrative Authority may, in its discretion, set forth specific requirements as conditions to providing such services and/or require specific prior approval from the appropriate regulatory agencies. The City's determination of feasibility will be based on the following factors:

1) Whether recycled water may be furnished for the intended use at a reasonable cost to the customer and the City;
2) Whether recycled water use is in accordance with the standards of treatment and water quality requirements set forth in Title 22, Division 4, of the Code of California Regulations and all other applicable federal, state and local laws and regulations including Health and Safety Code Chapter 5, Article 2, Title 17, Division 1 and California Water Code Division 7;
3) Whether the use of recycled water can be made in a manner not detrimental to public health.

Section 37.144 Requirement to Use Recycled Water

The Administrative Authority will identify customers who are located within the City's service area and within an area identified in the Recycled Water Master Plan as an area capable of receiving service from the City's recycled water system and will determine the feasibility of providing recycled water service to these customers. The Administrative Authority will also review applications for new Recycled Water permits to determine the feasibility of providing recycled water service to these applicants. If recycled water service is determined by the Administrative Authority to be feasible, applicants for new water service shall be required to install onsite facilities to accommodate both potable water and recycled water service in accordance with the latest Water, Sewer, and Reclaimed Water Design and Construction Manual. The Administrative Authority may also require existing customers to retrofit existing onsite water service facilities to accommodate recycled water service. When an existing customer is required by the City to convert to recycled water service, the customer will pay the reasonable capital costs of retrofitting the onsite water service facilities and the City will

provide the offsite facilities necessary to deliver recycled water to the customer. The City will provide a minimum of 6 months notification prior to commencement of recycled water deliveries.

Existing customers of potable water service who are directed to retrofit onsite water service facilities to permit the extension of recycled water infrastructure may appeal the final decision of the Administrative Authority to require retrofit to the City Council where such extension of recycled water service was not sought by the customer. The City Council may grant an appeal where the existing customer makes a showing based on substantial evidence that the Administrative Authority's decision would:

1) impose disproportionate cost on the customer compared to the potential benefits to be received by the customer as a result of the retrofit; or
2) constitute a threat to public health or safety at the location to be retrofitted; or
3) would be technically infeasible to implement.

Where the Council makes one or more of the above findings, the Council may disapprove the final decision of the Administrative Authority, in whole or in part, and may place such conditions on the requirement to retrofit as it deems appropriate and fair. The requirement to administratively appeal shall be a prerequisite to the initiation of any legal challenge to the Administrative Authority's final decision.

Section 37.145 Determination of Potential Recycled Water Customer Conversion

The Administrative Authority will identify potential sites where recycled water may be used based on historical water demands or projected demands from similar uses. The identified potential recycled water use sites must meet the following criteria:

1) The City's recycled water distribution system is in a street adjacent to the subject property;
2) The City can provide recycled water in the needed volume, quality, pressure and flow rate;
3) The anticipated use(s) at the subject site are allowed per Title 22 of the California Code of Regulations;

4) The construction/retrofit can be accomplished in compliance with Federal, State, County, and City requirements.
5) The anticipated use(s) will not negatively impact public health;
6) The use of recycled water will not diminish water rights; and
7) Recycled water is available at a reasonable cost, meaning:
    a. The commodity cost for recycled water is less than the commodity cost for a like quantity of non-interruptible potable water; and
    b. The net customer cost of facilities and appurtenances required to be installed can be amortized by the difference in potable and recycled water rates of a period of not more than one-hundred and twenty (120) months.

The Administrative Authority will contact the potential recycled water customer site representative to discuss the use of recycled water. If the potential recycled water customer contends recycled water is not feasible, the customer shall provide written documentation supporting their position to the Administrative Authority for review.

Section 37.146 Determination of Adequate Size and Reimbursement

For new developments where recycled water is anticipated and incorporated into the plans and conditions of approval, the Administrative Authority is authorized to determine if the size of any proposed recycled water pipeline is adequate to serve the intended use of the applicant. Further, the Administrative Authority is authorized to determine if there is other property within the City not being served with recycled water which could be served by the proposed recycled water pipeline. If the Administrative Authority determines that the proposed recycled water pipeline and appurtenant facilities should be constructed to a greater capacity than the immediate needs of the applicant, then the Administrative Authority may require the applicant to enter into a reimbursement agreement with the City providing for the construction of such recycled water pipeline with excess capacity.

The reimbursement agreement shall set forth a description of the project the applicant wishes to construct or have constructed, including complete specifications as to the type of pipe and other appurtenances, a map showing accurately the proposed route and size of such facility,

the estimated cost of construction of such facility, and the allocation of such cost between the applicant and the City. The reimbursement agreement shall be finalized and executed prior to commencement of construction on the project.

Section 37.147 Conversion of Facilities

Prior to the conversion of existing potable water systems or irrigation systems to a recycled water system, the applicant shall submit the record drawings to the City to review and determine the necessary measures to bring the recycled water system into full compliance with all applicable federal, state and local laws. If record drawings for a site do not exist, the applicant is responsible to locate the existing irrigation system and provide adequate as-built plans for the system prior to requesting a conversion of facilities. No existing potable water facilities shall be converted or incorporated into the recycled water system without proper testing and approval by the City and other regulatory agencies.

Section 37.148 Cross-Connection Control

All sites being served by both potable and recycled water services shall have an approved backflow assembly installed in compliance with all applicable laws.

A. Backflow Assemblies are required at every potable water service connection. The customer, at his or her sole expense, shall install, test and maintain an approved backflow assembly in accordance with California Code of Regulations Title 17, Section 7605.

B. Recycled water use site inspections will be performed per the requirements of the State of California Department of Public Health, County of San Diego Department of Environmental Health, California Regional Water Quality Control Board, San Diego Region, or other regulatory agency as determined by the City.

C. As required by the State Department of Health Services and the County of San Diego Department of Environmental Health Services, the City will periodically conduct a cross-connection control test of the integrity of the on-site recycled water system at those facilities having both potable and recycled water service.

D. The recycled water user shall provide the City with an accurate set of controller charts. The chart is to be a reduced drawing of the as-built system. The chart shall use a

different color to show the area of coverage for each station.

Section 37.149 Unlawful Use of Recycled Water Facilities and Appurtenances

It is unlawful for any person to turn on/off a recycled water pipeline of the City or to tap, break, or injure any recycled water pipelines within the City, or to tamper with or tap any recycled water service pipe.

Section 37.150 Interference with Inspection; Stoppage of Service

If any authorized employee or agent of the City is refused access to any premises supplied with recycled water by the City, or on being admitted is hindered or prevented from examining or inspecting the premises by any person, or for any reason, including but not limited to the maintenance on such premises of a vicious dog or animal, the Administrative Authority may provide written notice to the owner or occupant of the premises that the City intends to discontinue the service of recycled water to such premises. The notice shall provide the owner or occupant a reasonable opportunity to allow access so as to avoid discontinuance of service. The Administrative Authority may cause recycled water service to the premises to be discontinued if access is not allowed or restored within the time set forth in said written notice.

Section 37.151 Irrigation Recycled Water Meters

A meter and service connection used for landscape irrigation shall be installed in accordance with the Design Manual Standard Specifications and Drawings in effect at the time the connection is made. The size of the irrigation meter(s) and service connection(s) shall be determined by the landscape architect based on the flow demand in gallons per minute (gpm) for the area to be irrigated.

Only the City's Recycled Water Buy-in fees and meter fees shall be applied for any new recycled water meter.

Section 37.152 Interfering with Meter

It is unlawful for any person to interfere with or cut off or remove a recycled water meter from any service connection where it has been installed, without first receiving written permission from the City's Water Utilities Department. Such permission shall be granted only for the purpose of tests, repairs or replacement to customer service, readjustment of service or

similar emergencies.

Section 37.153 Rate Structure

The City rate structure for recycled water service shall be approved by the City Council. Rates shall be set at a level sufficient to pay for water treatment, maintenance and operations, debt service, replacement funding and to meet the objectives established by the Administrative Authority.

Recycled Water Rate - Recycled water is a flat rate per unit of recycled water used where one unit equals 748 gallons and applies only to the delivery of recycled water to the customer.

Section 37.154 Recycled Water System Buy-In Fees

Each new connection to the city's recycled water system shall be assessed a fee based on the meter size to pay the costs for a new meter and installation equipment provided by the city. Such fee shall be established hereafter by resolution of the Oceanside City Council. Customers shall pay only for the new meter and installation costs. Costs associated with the San Diego County Water Authority Capacity and Treatment charges and the City's buy-in costs, shall not apply to new recycled water system connections.

Section 37.155 Recycled Water System Meter Exchanges.

When converting to recycled water services, current potable water customers may exchange potable irrigation meters at no cost to the customer, provided the recycled meter required is of the same size as the existing meter. There shall be no refunds of buy-in fees as a result of this exchange.

SECTION 3. Severability.

If any section, sentence, clause or phrase of the Ordinance is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance. The City Council hereby declares that it would have adopted this Ordinance and each section, sentence, clause or phrase thereof, irrespective of the fact that any one or more section, subsections, sentences, clauses or phrases be declared invalid or unconstitutional.

SECTION 4. The City Clerk of the City of Oceanside is hereby directed to publish this ordinance, or the title hereof as a summary, pursuant to state statute, once within fifteen (15) days after its passage in the San Diego Union Tribune, North County edition, a newspaper of general circulation published in the City of Oceanside.

SECTION 5. This ordinance shall take effect and be in force on the thirtieth (30^{th}) day from and after its final passage.

INTRODUCED at a regular meeting of the City Council of the City of Oceanside held on the 6th day of August, 2014, and, thereafter,

PASSED, AND ADOPTED by the City Council of the City of Oceanside, California this 10th day of September, 2014, by the following vote:

AYES: WOOD, FELIEN, FELLER, KERN, SANCHEZ
NAYS: NONE
ABSENT: NONE
ABSTAIN: NONE

MAYOR, CITY OF OCEANSIDE

ATTEST:

CITY CLERK

APPROVED AS TO FORM:

CITY ATTORNEY

AN ORDINANCE OF THE CITY OF OCEANSIDE AMENDING CHAPTER 37 OF THE OCEANSIDE CITY CODE BY ADDING ARTICLE VIII, RECYCLED WATER

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Appendix H - CUWCC Reports

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CUWCC BMP Retail Coverage Report 2013

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

70 City of Oceanside, Water Dept

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name: Teresa Gomez

Title: Senior Management Analyst

Email: tkgomez@ci.oceanside.ca.us

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.		http://www.ci.oceanside.ca.us/civicax/filebank/blobdload.aspx?blobid=25976	Attached is the City of Oceanside's adopted Water Conservation Master Plan. For our targeted conservation efforts and messaging, see our website at www.savewateroceanside.com
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			City of Oceanside Chapter 37 Water Ordinances: -37.3 Wasting Water -Article V. Water Conservation Program City of Oceanside Chapter 29 Sewer Ordinances: -Art X Regulation of discharge -clean water act
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.		http://www.ci.oceanside.ca.us/civicax/filebank/blobdload.aspx?blobid=22659	In addition to the ordinance above, the City of Oceanside adopted a drought rate structure. Add'l reporting of water waste can be found https://www.ci.oceanside.ca.us/gov/water/services_programs/save/report.asp
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			Oceanside participated in the development of the San Diego regional model landscape ordinance with several member agencies, cities, representatives from the BIA & CLCA. Chapter 37 of the city code: -Article VII Water Efficient Landscape Regulations
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			

CUWCC BMP Retail Coverage Report 2013

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			The City of Oceanside requires water efficient design in development as well as adherence to the California Plumbing Code which regulates water efficiency with fixtures.

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

NOT ON TRACK

70 City of Oceanside, Water Dept

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
FY13OceansideWtrLoss.xls	
AWWA Water Audit Validity Score?	88
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

NOT ON TRACK

70 City of Oceanside, Water Dept

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 4/1/2013

Uploaded file name:

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption Yes Cost Effectiveness

Comments:

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

70 City of Oceanside, Water Dept

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	32986393.15	10164402.21
Multi-Family	Increasing Block	Yes	1750939.78	539533.26
Commercial	Uniform	Yes	1384865.59	426731.43
Industrial	Uniform	Yes	9497.21	2926.46
Institutional	Uniform	Yes	252107.7	77684.28
Dedicated Irrigation	Uniform	Yes	1040375.96	320580.66
Agricultural	Uniform	Yes	118283.41	36447.76
Other	Uniform	Yes	863.38	266.04
			37543326.18	**11568572.1**

Calculate: V / (V + M) **76 %**

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes

Customer Class	Rate Type	Conserving Rate?
Single-Family	Increasing Block	Yes
Multi-Family	Uniform	Yes
Commercial	Uniform	Yes
Industrial	Uniform	Yes
Institutional	Uniform	Yes

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

70 **City of Oceanside, Water Dept** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Diego County Water Authority

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quater of the reporting year? No

Public Outreach Program List	Number
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	45000
Website	4000
Landscape water conservation media campaigns	45000
General water conservation information	10000
Total	**104000**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Television contacts	5
News releases	2
Total	**7**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Outreach	11000
Total Amount:	**11000**

Description of all other Public Outreach programs

Plant Fair offering discounts on drought-tolerant plantsSDG&E for energy-related rebates/programs; AgriService for free compost

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2013

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

70 City of Oceanside, Water Dept **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Diego County Water Authority

Materials meet state education framework requirements? Yes

H2O Central website, H20 Where Do you Go? (Assembly), Waterology (Assembly), and Splash Lab mobile lab including handouts and worksheets

Materials distributed to K-6? Yes

H2O Central website provides brochures, websites, and links to educational water games, posters are available for classrooms, Splash Lab mobile lab including handouts and worksheets on water conservation and clean water.

Materials distributed to 7-12 students? Yes (Info Only)

Regional Water Quality Testing Workshop

Annual budget for school education program: 25000.00

Description of all other water supplier education programs

A customized presentation developed by the City of Oceanside that encompasses water conservation, clean water and recycling concepts is available to all K-6 schools.

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Retail Coverage Report 2014

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

70 City of Oceanside, Water Dept

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name: Teresa Gomez

Title: Senior Management Analyst

Email: tkgomez@ci.oceanside.ca.us

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.		http://www.ci.oceanside.ca.us/civicax/filebank/blobdload.aspx?blobid=25976	Attached is the City of Oceanside's adopted Water Conservation Master Plan. For our targeted conservation efforts and messaging, see our website at www.savewateroceanside.com
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			City of Oceanside Chapter 37 Water Ordinances: -37.3 Wasting Water -Article V. Water Conservation Program City of Oceanside Chapter 29 Sewer Ordinances: -Art X Regulation of discharge -clean water act
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.		http://www.ci.oceanside.ca.us/civicax/filebank/blobdload.aspx?blobid=22659	In addition to adoption of our drought ordinance above, the City of Oceanside adopted a drought rate structure. Add'l reporting of water waste can be found https://www.ci.oceanside.ca.us/gov/water/services_programs/save/report.asp
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			Oceanside participated in the development of the San Diego regional model landscape ordinance with several member agencies, cities, representatives from the BIA & CLCA. Chapter 37 of the city code: -Article VII Water Efficient Landscape Regulations
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			

CUWCC BMP Retail Coverage Report 2014

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			The City of Oceanside requires water efficient design in development as well as adherence to the California Plumbing Code regulates water efficiency with fixtures.

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control

NOT ON TRACK

70 City of Oceanside, Water Dept

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
FY14OceansideWtrLoss.xls	
AWWA Water Audit Validity Score?	88
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

NOT ON TRACK

BMP 1.3 Metering With Commodity

70 City of Oceanside, Water Dept

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 4/1/2013

Uploaded file name: BMP 1.3 Feasibility Study response for Oceanside.pdf

Completed a written plan, policy or program to test, repair and replace meters	Yes

At Least As effective As No

Exemption Yes Cost Effectiveness

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

On Track

70 City of Oceanside, Water Dept

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	36721732.47	10826623.36
Multi-Family	Increasing Block	Yes	1935796.41	570728.48
Commercial	Uniform	Yes	1535616.94	452744.06
Industrial	Uniform	Yes	10531.04	3104.85
Institutional	Uniform	Yes	285295.42	84113.3
Dedicated Irrigation	Uniform	Yes	1159371.64	341816.12
Agricultural	Uniform	Yes	131159.3	38669.54
Other	Uniform	Yes	957.37	282.26
			41780460.59	**12318081.97**

Calculate: V / (V + M) **77 %**

Implementation Option: Use Annual Revenue As Reported

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: Yes

Customer Class	Rate Type	Conserving Rate?
Single-Family	Increasing Block	Yes
Multi-Family	Uniform	Yes
Commercial	Uniform	Yes
Industrial	Uniform	Yes
Institutional	Uniform	Yes

At Least As effective As No

Exemption No

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

70 **City of Oceanside, Water Dept** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Diego County Water Authority

The name of agency, contact name and email address if not CUWCC Group 1 members

Home Depot

Did at least one contact take place during each quater of the reporting year? No

Public Outreach Program List	Number
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	135000
Website	6000
Landscape water conservation media campaigns	45000
General water conservation information	15000
Total	**201000**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Television contacts	9
News releases	4
Total	**13**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Billing inserts	8000
Printing	5000
Design	4000
Public Relations	8000
Total Amount:	**25000**

Description of all other Public Outreach programs

Plant Fair offering discounts on drought-tolerant materialSDG&E - community events; AgriService - free mulch/compost

Comments:

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

At Least As effective As	No	
Exemption	No	0

CUWCC BMP Coverage Report 2014

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

70 City of Oceanside, Water Dept **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

San Diego County Water Authority

Materials meet state education framework requirements? Yes

H2O Central website, H20 Where Do you Go? (Assembly), Waterology (Assembly), and Splash Lab mobile lab including handouts and worksheets

Materials distributed to K-6? Yes

H2O Central website provides brochures, websites, and links to educational water games, posters are available for classrooms, Splash Lab mobile lab including handouts and worksheets on water conservation and clean water.

Materials distributed to 7-12 students? Yes (Info Only)

Regional Water Quality Testing Workshop

Annual budget for school education program: 38000.00

Description of all other water supplier education programs

A customized presentation developed by the City of Oceanside that encompasses water conservation, clean water and recycling concepts is available to all K-6 schools.

Comments:

At Least As effective As No

Exemption No 0

CUWCC BMP Coverage Report 2014

70 City of Oceanside, Water Dept

Baseline GPCD: 170.31

GPCD in 2014 142.29

GPCD Target for 2018: 139.70

Biennial GPCD Compliance Table

ON TRACK

		Target		Highest Acceptable Bound	
Year	Report	% Base	GPCD	% Base	GPCD
2010	1	96.4%	**164.20**	100%	**170.30**
2012	2	92.8%	**158.00**	96.4%	**164.20**
2014	3	89.2%	**151.90**	92.8%	**158.00**
2016	4	85.6%	**145.80**	89.2%	**151.90**
2018	5	82.0%	**139.70**	82.0%	**139.70**

Appendix I - Notification

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Agencies Notified of the City of Oceanside 2015 UWMP
Olivenhain Municipal Water District
Rincon del Diablo Municipal Water District
San Elijo Joint Powers Authority
San Diego County Water Authority
San Diego Association of Governments
County of San Diego
City of Carlsbad
Carlsbad Municipal Water District
Vallecitos Water District
City of Escondido
Leucadia Wastewater District
Metropolitan Water District of Southern California
Santa Fe Irrigation District
Rainbow Municipal Water District
Vista Irrigation District
Valley Center Municipal Water District
Camp Pendleton

CITY OF OCEANSIDE
WATER UTILITIES DEPARTMENT

CITY OF OCEANSIDE
60-DAY PUBLIC HEARING NOTICE
2015 URBAN WATER MANAGEMENT PLAN

City of Oceanside
300 North Coast Highway
Oceanside, CA 92054

March 30, 2016

This letter is to inform you that City of Oceanside (City) is updating its Urban Water Management Plan (UWMP). California state law requires each urban water supplier to prepare and adopt an UWMP every five years. The City is currently preparing an update to its 2010 UWMP. The 2015 UWMP documents the City's plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions, including water shortages.

In conformance with the California Water Code Division 6, Part 2.6, §10621, this letter serves as a notification to all city and county agencies within which the City provides water supplies that the UWMP is being reviewed and updated. The draft 2015 UWMP will be available for public review on May 9, 2016 on the City's website. Notice is hereby given that on Wednesday, June 1, 2016 at 6:00pm at the Council Chambers of the Civic Center, 300 North Coast Highway, Oceanside, CA 92054, the City Council will conduct a public hearing to discuss the draft 2015 UWMP. The final 2015 UWMP will be considered for adoption by the City Council on Wednesday, June 22, 2016 at 5:00pm at the same location. The adopted 2015 UWMP will be submitted to the California Department of Water Resources by July 1, 2016.

Please contact Ms. Teresa Gomez at (760) 435-5815 or tkgomez@ci.oceanside.ca.us if you would like additional information or to set up a meeting to discuss the City's 2015 UWMP.

Sincerely,

City of Oceanside

Cari Dale
Water Utilities Director

CITY OF OCEANSIDE
CITY COUNCIL
NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the City Council of the City of Oceanside will conduct a **public hearing** on **Wednesday, June 1, 2016 at 6:00 PM,** or soon thereafter as possible, in the Council Chambers of the Civic Center, 300 North Coast Highway, Oceanside, California, to consider the following:

REVIEW OF DRAFT 2015 URBAN WATER MANAGEMENT PLAN FOR COMPLIANCE WITH THE CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT (CALIFORNIA WATER CODE DIVISION 6, PART 2.6).

For further information on this item, please contact Teresa Gomez, Water Utilities Department at (760) 435-5815, 7:30 a.m. to 5:00 p.m. Monday through Thursday and 7:30 a.m. to 4:00 p.m. on Friday.

The agenda and staff report will be available the Monday before the public hearing. You may view this information at www.ci.oceanside.ca.us by clicking on City Council Agenda/Minutes and the June 1, 2016 Staff Reports.

If you should wish to challenge this matter in court at some future time, you may be limited to raising only those issues you or someone else raised at the public hearing described in the notice or in written correspondence delivered to the City Clerk at or prior to the public hearing at 300 North Coast Highway, Oceanside, CA 92054.

Zack Beck
City Clerk

Publish: On or before May 18 and 25, 2016

Order ID: 4199879

* Agency Commission not included

GROSS PRICE * : **$116.84**

PACKAGE NAME: Legal-6col-Legal Notices

Product(s): San Diego Union Tribune, CApublicnotice.com, mobile.sduniontribune.com
AdSize(s): 2 Column,
Run Date(s): Sunday, May 22, 2016
Color Spec. B/W

Preview

CITY OF OCEANSIDE
CITY COUNCIL
NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the City Council of the City of Oceanside will conduct a **PUBLIC HEARING** on **WEDNESDAY, JUNE 22, 2016 AT 6:00 PM**, or as soon thereafter as possible, in the Council Chambers of the Civic Center, 300 North Coast Highway, Oceanside, California, to consider the following:

REVIEW OF DRAFT 2015 URBAN WATER MANAGEMENT PLAN FOR COMPLIANCE WITH THE CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT (CALIFORNIA WATER CODE DIVISION 6, PART 2.6).

For further information on this item, please contact Teresa Gomez, Water Utilities Department at (760) 435-5815, 7:30 a.m. to 5:00 p.m. Monday through Thursday and 7:30 a.m. to 4:00 p.m. on Friday.

The agenda and staff report will be available the Monday before the public hearing. You may view this information on the City's website at www.ci.oceanside.ca.us by clicking on City Council Agenda/Minutes and the June 22, 2016, Staff Reports.

If you should wish to challenge this matter in court at some future time, you may be limited to raising only those issues you or someone else raised at the public hearing described in the notice or in written correspondence delivered to the City Clerk at or prior to the public hearing at 300 North Coast Highway, Oceanside, CA 92054.

Publish: 6/8/16

Zack Beck
City Clerk

Appendix J - Adoption Resolution

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RESOLUTION NO. 16-R0431-1

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF OCEANSIDE ADOPTING THE 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan (Plan), the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the City of Oceanside is an urban supplier of water providing water to a population over 175,948;

WHEREAS, the Urban Water Management Plan shall be periodically reviewed at least once every five years and the City shall make any amendments or changes to its plans which are indicated by the review;

WHEREAS, the proper and cost effective conservation of our water resources is essential to insuring adequate water supplies now and in the future;

WHEREAS, water conservation is recognized as an integral part of all water programs;

WHEREAS, the City of Oceanside has completed a 2015 Urban Water Management Plan pursuant to the requirements of California Water Code Section 10620;

WHEREAS, the Plan is the formal document to discuss past, current, and projected water demands; current and alternate water conservation measures; water supply deficiencies; and future water management practices;

WHEREAS, the Plan must be adopted after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption;

WHEREAS, the City has prepared and circulated for public review a draft 2015 Urban Water Management Plan (2015 Plan) and a properly noticed public hearing regarding the 2015 Plan was held by the City; and

WHEREAS, the City did prepare and shall file said 2015 Plan with the California Department of Water Resources.

NOW, THEREFORE, the City Council of the City of Oceanside DOES RESOLVE as follows:

SECTION 1. The 2015 Urban Water Management Plan for the City of Oceanside, a copy of which is available in the City Clerk's office, is hereby adopted and approved.

SECTION 2. The Water Utilities Director of the City of Oceanside is hereby authorized and directed to implement the water conservation measures included in the local and regional water conservation effort made part of the Plan.

PASSED AND ADOPTED by the City Council of the City of Oceanside, California, this 22nd day of June, 2016, by the following vote

AYES: WOOD, FELLER, KERN, LOWERY, SANCHEZ
NAYES: NONE
ABSENT: NONE
ABSTAIN: NONE

MAYOR, CITY OF OCEANSIDE

ATTEST:

CITY CLERK

APPROVED AS TO FORM:

CITY ATTORNEY