City of Ventura

Photo By: Mary Meyer (2011)

FINAL

2015 Urban Water Management Plan *for* **City of Ventura**

June 2016

Prepared by
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2015 Urban Water Management Plan
Final

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City of Ventura
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K/J Project No. 1644212*00

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Acronyms

The following abbreviations and acronyms are used in this report.

AB	Assembly Bill
Act	Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
BMPs	Best Management Practices
Casitas	Casitas Municipal Water District
CAT	Climate Action Team
CEQA	California Environmental Quality Act
City	City of Ventura
CCF	Hundred Cubic Feet
COG	Council of Governments

DDW	State Water Resources Control Board Division of Drinking Water
DMMs	Demand Management Measures
DWR	Department of Water Resources
EIR	environmental impact report
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
ETo	evapotranspiration
FCGMA	Fox Canyon Groundwater Management Agency
Foster Park	Ventura River Foster Park Area
GIS	Geographic Information System
GPCD	gallons per capita per day
GWMP	Groundwater Management Plan
HCD	State Department of Housing and Community Development
HCF	hundred cubic feet
LAFCO	Local Agency Formation Commissions
MF	microfiltration
MG	million gallons
mg/L	milligrams per liter
MGD	million gallons per day
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System
OVSD	Ojai Valley Sanitary District
Plan	Urban Water Management Plan
RHNA	Regional Housing Needs Allocation
RWQCB	Regional Water Quality Control Board
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCAG	Southern California Association of Governments
SGMA	Sustainable Groundwater Management Act
SPBPA	Santa Paula Basin Pumpers Association
SWP	State Water Project
TEA	Temporary Extraction Allocation
TDS	Total Dissolved Solids
United	United Water Conservation District
UF	Ultrafiltration
UWMP	Urban Water Management Plan
VCG	Ventura County Council of Governments
Ventura Water	City of Ventura Water Department
VWRF	Ventura Water Reclamation Facility
WSS	Water Sense Specification

Section 1: Introduction

1.1 Overview

This volume presents the Urban Water Management Plan 2015 (Plan) for the City of Ventura Water Department (the City, Ventura Water) service area, which includes the City boundary as well as unincorporated areas within the City's Sphere of Influence. This chapter describes the general purpose of the Plan, discusses Plan implementation, and provides general information about the service area characteristics. A list of acronyms and abbreviations is provided at the end of the table of contents.

1.2 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan includes a section which "describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (California Urban Water Management Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Plan as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- What are the potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five year increments (the City is going beyond the requirements of the Act by developing a plan which spans 25 years.)

- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.

- Implements conservation and efficient use of urban water supplies.

State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7) was signed into law in November 2009, which calls for progress towards a 20 percent reduction in per capita water use statewide by 2020. The legislation mandates each urban retail supplier to develop and report an interim 2015 water use target, their baseline daily per capita use and 2020 compliance daily per capita use, along with the basis for determining those estimates. This UWMP reports on Ventura Water's progress in meeting the SBX7-7 targets.

In short, the Plan answers the question: *Will there be enough water for the area served by the City in future years, and what mix of programs should be explored for making this water available?*

It is the stated goal of the City to deliver a reliable and high quality water supply for customers, even during dry periods. The analysis in this Plan documents that it is necessary for the City to implement planned water supply projects in order to meet normal and dry-year demands. In the near term (2020 to 2030) until such time as planned supplies come on-line, anticipated supplies in a multiple-dry year are insufficient and the City would have to call on existing customers to undertake extraordinary conservation. After planned water supplies are available the potential for a water supply shortage is lessened.

1.2.1 Relationship to the City's Annual Comprehensive Water Resources Report

The Urban Water Management Plan is required by the California State Water Code. The UWMP is a long-term planning tool that provides water purveyors and their customers a broad perspective on water supply issues over a 20-year period (this plan goes further and looks at 25-years). The UWMP is a management tool, providing the framework for action but not functioning as a detailed project development plan.

In 2013 the City Council directed Ventura Water and the Community Development Department to work together to develop a short term balance of water supply and demand, the result of this collaboration is the annual Comprehensive Water Resources Report (CWRR). The CWRR specifically focuses on water demand of approved (entitled) projects only. The CWRR focuses on a short timeframe and on near-term demand changes. The CWRR estimates demands from approved projects whereas the UWMP estimates demands from population projections. In the latest (2016) Draft CWRR the estimated demand of approved projects would be fully vested by year 2024. This latest CWRR projects out the estimated demand to the year 2030 using a growth rate of 0.55 percent (the Department of Finance historical data for City of Ventura population growth).

Understanding and monitoring our water supply and demand is essential to planning for and managing a stable and reliable water system to support our community and economic growth. Our supply and demand plays an important role and dramatically influences the planning for, development of, and investment of significant dollars in capital improvements, maintaining our current water supply and investing in new water supplies. Therefore, the annual CWRR is an important tool that the City utilizes to update the City's annual projected water supply and demand.

1.3 Structure and Organization of the Plan

This plan is organized as follows:

- Introduction
- Water Demand
- Water Resources
- Recycled Water
- Water Quality
- Reliability Planning
- Water Shortage Event Contingency Planning
- References
- Appendices

Appendix A contains a checklist documenting how this UWMP meets the requirements of the Urban Water Management Planning Act and SB X7-7. Starting with the 2015 UWMP, urban water suppliers are required to report and submit information in standardized tables developed by the Department of Water Resources (DWR). These standardized tables are provided as Appendix B of this document.

This plan is being prepared for Ventura Water, a Department of the City of Ventura, and is an individual rather than Regional Urban Water Management Plan. Data provided in this plan are reported in calendar years rather than fiscal years. To the extent possible water volumes are reported in acre-feet (AF). Tables 1-1 and 1-2 document the structure of this plan.

TABLE 1-1
PUBLIC WATER SYSTEM COVERED BY THIS PLAN

Public Water System Number	Public Water System Name	# of Municipal Connections 2015	Volume of Water Supplied 2015 (AF)*
CA5610017	City of San Buenaventura Water Department	~32,000	13,353

Notes: *Includes all metered consumption

TABLE 1-2
AGENCY AND PLAN STRUCTURE

Type of Agency
☐ Agency is a Wholesaler
☑ Agency is a Retailer
Fiscal or Calendar Year
☑ UWMP Tables are in Calendar Year
☐ UWMP Tables are in Fiscal Year
Units of Measure Used in this UWMP
☑ Acre Feet (AF)
☐ Million Gallons (MG)
☐ Hundred Cubic Feet (CCF)

1.4 Implementation of the Plan

Preparation of UWMP 2015 was coordinated by Ventura Water. Ventura Water staff met with and coordinated the development of the UWMP with various City departments as well as the Ventura Water Commission. Based on the City's 2005 General Plan, Sustainable Infrastructure, Policy 5B, Ventura Water has adopted guidelines which require that adequate water supply, system capacities, and wastewater collection system and treatment capacities are available before new development can be approved by the Community Development Department. This subsection provides the cooperative framework within which the Plan will be implemented including agency coordination, public outreach, and resources maximization.

1.4.1 Joint Preparation of the Plan

The UWMP Act requires water suppliers to coordinate the preparation of its plan with other appropriate agencies in the area. This includes other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. Various agencies are involved in supplying water to the City or having jurisdiction over a portion of the water resources. This section briefly discusses each one. Table 1-3 summarizes the efforts the City has taken to include the various City departments, agencies and citizens in the preparation of this document.

- **City of Ventura Community Development Department**
  The Community Development Department is responsible for planning and zoning, economic development, housing and redevelopment for the City of Ventura. The department works with various city departments, city commissions, and the City Council to guide and provides advice regarding growth in the city. The Community Development Department works with the community and City Council to create and document the vision for land use in the city and the various policies and regulations applicable to redevelopment and new develop. The Community Development Department was consulted regarding changes in population and economic activity in the service area which may affect water demands.

TABLE 1-3
AGENCY COORDINATION SUMMARY

	Participated in UWMP Development	Commented on the Draft	Attended Public Meetings	Contacted for Assistance	Received Copy of Draft	Sent Notice of Intention to Adopt	Not Involved / No Information
City Departments	X			X	X	X	
Fox Canyon GMA		X		X	X	X	
Casitas MWD		X		X	X	X	
United Water Conservation District				X	X	X	
Ventura County Resource Mgmt. Agency				X	X	X	
City of Oxnard				X	X	X	
Ventura County Local Agency Formation Commission				X	X	X	
Ojai Valley Sanitary District						X	

- **Ventura County**
  Ventura Water serves a very minor amount of water to connections outside the City limits within the unincorporated County. These connections must meet the City's policy for water connections (Municipal Code Section 22.110.055). Ventura Water notified the County Resource Management Agency of the UWMP Update and the methods by which the County could provide input to the plan. In December 2015, the County of Ventura started an update to its General Plan; Ventura Water is participating in the General Plan Update.

- **Casitas Municipal Water District (Casitas)**
  Casitas is a wholesaler of treated surface water from Lake Casitas to the City under the terms and conditions of the 1995 Agreement. The western portion of the City is within the Casitas service area. Ventura Water notified Casitas of the 2015 UWMP Update and the methods by which Casitas could provide input to the Plan.

- **Fox Canyon Groundwater Management Agency (FCGMA)**
  The FCGMA was created by state legislation in 1982 to manage local groundwater basins and resources in a manner to reduce overdraft of the Oxnard Plain and stop seawater intrusion. A major goal of the FCGMA is to regulate and reduce future extractions of groundwater from the Oxnard Plain aquifers, in order to operate the basin at a safe yield. Ventura Water withdraws water from the Oxnard Plain Groundwater Basin and is subject to the management policies of the FCGMA. Ventura Water notified FCGMA of the 2015 UWMP Update and the methods by which the FCGMA could provide input to the plan.

- **United Water Conservation District (United)**
  United is primarily a groundwater recharger and a wholesale purveyor in central Ventura County and does not provide any water directly to the City. However, all of the City's groundwater wells within the Mound, Oxnard Plain, and Santa Paula groundwater basins are within United's boundaries and are subject to United's semi-annual extraction fees. Ventura Water notified United of the 2015 UWMP Update and the methods by which United could provide input to the plan.

- **Others**
  The City of Ventura also contacted neighboring jurisdictions such as the City of Oxnard, and other water suppliers such as Calleguas Municipal Water District to give them the opportunity to provide input to the UWMP.

1.4.2 Plan Adoption

The City began preparation of this Plan in January 2016. A draft of the plan was presented to and reviewed by the City Water Commission on April 26, 2016. The final draft of the Plan was adopted by the City Council on June 13, 2016 by Resolution No. 2016-029 (Appendix C) and submitted to DWR within 30 days of City Council approval. This plan includes all information necessary to meet the requirements of Water Conservation Act of 2009 (Wat. Code, §§ 10608.12-10608.64) and the Urban Water Management Planning Act (Wat. Code, §§ 10610-

10656). Additionally, the plan has also been submitted to all appropriate entities and made available for public review per the requirements of the Urban Water Management Planning Act.

1.4.3 Public Outreach

Urban water agencies preparing plans are required to hold a public hearing on the UWMP prior to its adoption. In response to these requirements, a public hearing was conducted on June 13, 2016 by the City to receive public comment and input on the UWMP. Table 1-4 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, newsletter covers, website postings, and invitation letters are attached in Appendix D.

TABLE 1-4
PUBLIC PARTICIPATION TIMELINE

Public Workshops and Hearings	Date	Public Participation Task
UWMP Administrative Draft	April 26, 2016	Presentation at City Water Commission
UWMP Final Draft	May 24, 2016	Presentation at City Water Commission
Draft Available	May 27, 2016	Available For Public Review
Public Hearing	June 13, 2016	City Council Meeting
Adoption	June 13, 2016	City Council Meeting

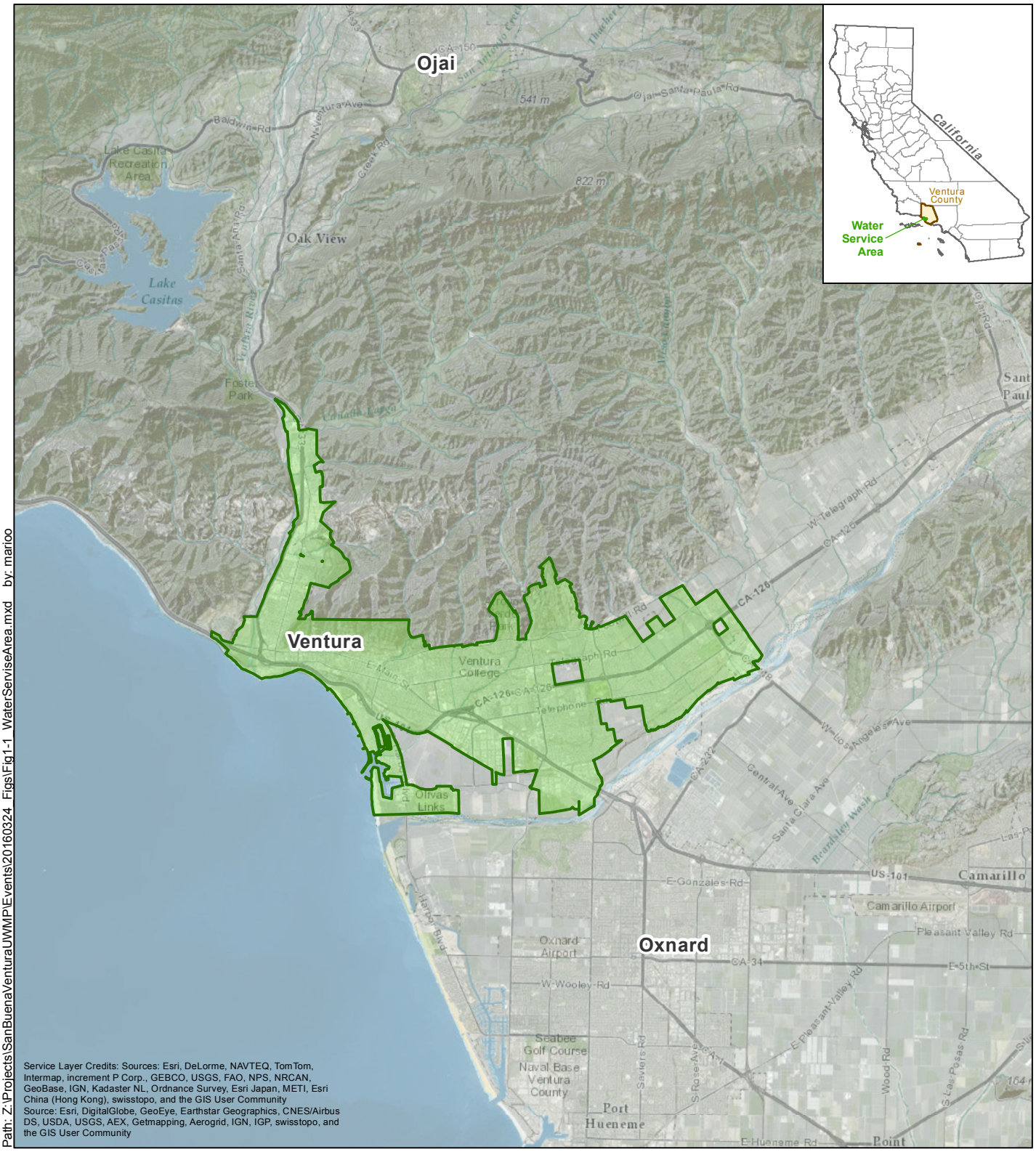
1.5 System Description

The City is located 62 miles north of Los Angeles and 30 miles south of Santa Barbara along the California coastline. The City's planning area is bounded by the Ventura River on the west, Foster Park on the north, Franklin Barranca and the Santa Clara River to the east, with the Pacific Ocean as the southern boundary. The total planning area encompasses approximately 40 square miles. The City water service area is shown on Figure 1-1.

The City developed as a result of the ninth and last mission founded in California by Father Junipero Serra in 1782. In 1866, the City incorporated an area of about one square mile around the original Mission San Buenaventura. Since that time, the City has grown to an estimated 21 square miles. An estimated population of 112,412[1] is currently supplied water from the City's water system. This includes several unincorporated County areas, such as the upper North Ventura Avenue area to the north and developing areas east of the City boundary. The City Charter provides for a Council-Manager form of government. A seven member Council is elected at large for four-year terms, with the Mayor selected by the Council for a two-year term.

The Spanish Fathers of Mission San Buenaventura developed the first water system for the City. It consisted of an aqueduct (now abandoned) to convey water from the Ventura River, near San Antonio Creek, to a reservoir located behind the Mission.

[1] This population estimate is based on input from the Community Development Department. Current (2015) population as estimated by the DWR Population Tool (described in section 2.3.20) is 110,007. The consistency in these numbers (less than 2.1 % difference) confirms the fitness of the two approaches.



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Legend

Water Service Area

N

0 7,000 14,000

Scale: Feet

Kennedy/Jenks Consultants

City of Ventura UWMP
Ventura, CA

City Of Ventura Water Service Area

KJ 1644212*00
March 2016

Figure 1-1

During subsequent development around the Mission, additional groundwater was obtained from wells in the Ventura and Santa Clara River basins. Water facilities were developed and operated for the City by several individuals and companies over the period of 1869 to 1923. In 1923, the City acquired the water system, along with its water rights from the Ventura River, from the Southern California Edison Company and assumed the responsibility of providing water to City residents. In years following, the City developed additional sources of surface and groundwater, including wells and improvements to the surface water diversion from the Ventura River. Also, since 1960, the City has purchased surface water from Casitas Municipal Water District to supplement its water supplies. As development occurs on the east side of the City, additional groundwater facilities have been completed to meet increasing demands.

Currently, the City's water system serves approximately 32,000 water service connections, which includes the population of the City plus some additional areas outside the City boundaries. The western portion of the City is within the Casitas Municipal Water District service area. The mid and eastern portion of the City are within United Water Conservation District's boundaries. Water service is provided to all residential, commercial, industrial and irrigation customers; including fire protection users.

The City water system is a geographically complex system of 16 pressure zones, 10 active wells, 21 booster stations, approximately 380 miles of pipelines ranging from 4-inches to 36-inches in diameter, and a total storage capacity of approximately 52 million gallons (MG) in 32 tanks and reservoirs. The system delivers water from sea level to a maximum elevation of over 1,000 feet. The City operates three purification facilities, including one membrane filtration treatment plant for surface water sources on the west side of the City, and two iron/manganese removal treatment plants for groundwater sources on the east side[2]. The City also maintains and operates the Ventura Water Reclamation Facility. See Section 4 for further description of the Reclamation Facility.

1.6 Population

The City water service area is an established community comprised primarily of residential areas with opportunities for infill development. Large commercial and industrial areas exist along Main Street, Harbor Boulevard, Telephone Road, Ventura Avenue, Telegraph Road and Victoria Avenue[3]. In 2005, the City of Ventura adopted the 2005 Ventura General Plan to redirect future growth toward 'Infill First' with an emphasis on encouraging more dense development of housing alongside commercial uses in the above mentioned commercial corridors, as well as Johnson Drive and Wells Road. The City's estimated population growth for the water service area is shown in Table 1-5. The population numbers reflect both the population within the City of Ventura limits as well as the minor number of customers in the unincorporated county.

Future projections for areas within the City reflect a 0.55 percent annual growth rate[4]. Projections for areas served by the water system outside of the City are based on the historical annual growth rate (3-year average from 2013 to 2015) of 0.2273 percent in the number of connections. Population estimates were extrapolated to fit five year increments. It is important

[2] City of San Buenaventura Water Master Plan, 2011. Pages VI-1 to VI-15

[3] City of San Buenaventura Water Master Plan, 2011.

[4] Projections were provided by City of Ventura Community Development Department and are based on the historic growth rate, California Department of Finance Data, years 2000 to 2015.

to note that these figures are not intended to represent support for, nor reflect any commitment to, this level of growth. Rather, it is to provide a safe margin in planning for long-term water improvements that might be needed given the amount of growth that could be allowed under the City's 2005 updated General Plan as assessed in the certified EIR.

TABLE 1-5
POPULATION PROJECTIONS

	2015	2020	2025	2030	2035	2040
City of Ventura	109,338	112,378	115,503	118,714	122,015	125,407
Unincorporated	3,074	3,109	3,145	3,180	3,217	3,254
Total	**112,412**	**115,487**	**118,647**	**121,895**	**125,232**	**128,661**

1.7 Climate

San Buenaventura has a climate that is similar to a Mediterranean coastal city. That is, the winters are cool, and the summers are mild. The average temperature range is in the 70s and it is uncommon for the temperature to drop below freezing. The area has an average rainfall of approximately 14 inches. Table 1-6 shows the average annual climate information by month.

TABLE 1-6
ANNUAL CLIMATE INFORMATION

	Jan	Feb	Mar	Apr	May	Jun
Standard Monthly Average ETo	2.3	2.7	3.8	4.5	5.1	4.9
Average Rainfall (in)	3.01	3.06	1.83	0.94	0.34	0.03
Average High Temperature (ºF)	66.9	65.3	68.2	68.0	67.7	70.9

	Jul	Aug	Sept	Oct	Nov	Dec
Standard Monthly Average ETo	5.2	5.0	4.1	3.2	2.5	2.0
Average Rainfall (in)	0.03	0.01	0.07	0.93	1.36	2.52
Average High Temperature (ºF)	73.0	74.3	74.3	73.7	71.2	69.9

Source:
Evapotranspiration (ETo) data from Station #156 in Oxnard as provided on the CIMIS website database at www.cimis.water.ca.gov for the period of record from June 2001 to February 2016.
The average rainfall data is from Ventura County Watershed Protection District's web site for Station 66E, www.countyofventura.org, for the period October 2000 to September 2015.
The average temperature figures are from the Western Regional Climate Center web site at www.wrcc.dri.edu for Station 049285 VENTURA.

1.8 Potential Effects of Climate Change

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. Climate change models have predicted that potential effects from climatic changes will result in increased temperature, early snow melt, and a rise in sea level.

In the 2013 update of the *DWR California Water Plan*, the implications of future climate conditions are evaluated. These changing hydrological conditions could affect future planning efforts, which are typically based on historic conditions. The *California Water Plan* identifies the following probable impacts due to changes in temperature and precipitation:

- More winter runoff and less spring/summer runoff due to warmer temperatures.
- Greater extremes in flooding and droughts.
- Greater water demand for irrigation and landscape water due to increased temperatures and their impacts on plant water needs.
- Increased sea level rise, increased threat of coastal flooding, and salt water intrusion into coastal groundwater aquifers.

Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. It is typical that about half of the water used by residential development is for outdoor use and therefore it is assumed that outdoor water use is a large component of Ventura water demands.

Section 2: Water Demands

2.1 Overview

This chapter describes historic and current water usage and the methodology used to project future demands within the City's service area. The City's water system provides potable water to residential, commercial, industrial, institutional, and irrigation customers. Untreated water is provided to an industrial user and a few irrigation customers in the vicinity of the raw water pipeline system in the North Ventura Avenue area. Recycled water is provided for general irrigation of two golf courses, a City park, and landscape irrigation along the existing distribution alignment. The City's water use sectors are described below.

- **Residential Sector**
  The residential sector of the City is comprised of single and multi-family residential customers. Currently, there are approximately 23,000 single family and 2,700 multi-family residential accounts. The multi-family accounts represent approximately 21,350 residential dwelling units served under master meters on apartment and condominium complexes as well as mobile home parks. The residential sector represents approximately 64 percent of the City's total water consumption. Within the residential sector, single family accounts make up two thirds of the total residential demand.

- **Commercial Sector**
  The City contains several different types of commercial customers, including gas stations, large shopping complexes, auto dealerships, restaurants, business parks, office buildings, hotels, and hospitals. The City includes several tourist-driven businesses such as hotels, which benefit from the high volume of tourist traffic. The largest commercial sector users are hotels and hospitals. The commercial sector accounts for approximately 22 percent of the City's water consumption, with hospitals utilizing approximately two percent of the total 22 percent.

- **Industrial Sector**
  The City contains a relatively small industrial sector. The industrial sector utilizes approximately three percent of the City's water demand.

- **Institutional/City Sector**
  The City's institutional sector is relatively stable. In addition, school facilities and churches are included in this sector. The Institutional/City Sector utilizes approximately three percent of the water demand.

- **Irrigation Sector**
  The City's landscape metered uses include assessment districts, contract parks, City parks, and other irrigation areas. Landscape accounts comprise of approximately three percent of total water use with City parks utilizing approximately 80 percent of the water in this sector.

- **Other Uses**
  The City has miscellaneous usage which is metered, but not charged, for a few historical water rights accounts. Other metered miscellaneous uses include the following: fireline consumption, temporary meters, fire training. This usage is estimated to be less than one percent of total water demand.

- **Recycled Water**
  The City provides recycled water delivered from the City's Water Reclamation Facility for general irrigation at two golf courses, a City park, and landscape irrigation along the existing distribution alignment. This usage accounts for approximately five percent of total water demand.

- **Unaccounted Water**
  Unaccounted water is estimated based on a comparison of billing records (consumption) versus production records and does not include recycled water in this report. Based on City historical information it is estimated at approximately 5 to 10 percent of total produced water since 2005. The City of Ventura reviewed apparent loss (loss due to meter inaccuracies) and real loss (due to leaks or theft) from January to December 2015 using DWR's Water Audit Method[5]. The DWR method estimates that meter inaccuracies account for about one percent of the unaccounted water; "real" losses are estimated to be about 9 percent of production. It should be noted that the water loss estimate (9 percent) resulting from use of DWR's Water Audit Method is elevated; a simple comparison of production versus sales does not support this high level of loss. The Water Loss Audit Report is provided in Appendix E.

2.2 Historical Water Use

Currently the City has approximately 32,000 service connections serving 112,412 people[6]. All service connections are metered. Water consumption within the City has decreased in recent years. The annual per capita usage from 1940 to 1970 averaged about 277 gallons per capita per day (GPCD). In the period 1985 through 1989, the annual per capita use averaged about 196 GPCD. In the period 1994 through 2010, the per capita figure dropped to an average of 166 GPCD. This decrease in per capita consumption is the result of plumbing code changes such as low flow fixtures and low water consuming appliances in some existing and all new housing; and an active water conservation program adopted by the City in 1975 and further strengthened with regulations in 1990.

Ventura residents have responded to the City's recent drought declaration and conservation messages. From 2010 to 2015 the estimated water use dropped to 117 GPCD. Table 2-1 summarizes demands in 2015.

[5] http://www.water.ca.gov/urbanwatermanagement/docs/2015/DWR%20Water%20Audit%20Manual%20FINAL.pdf

[6] This population estimate is based on input from the Community Development Department. Current (2015) population as estimated by the DWR Population Tool (described in section 2.3.20) is 110,007. The consistency in these numbers (less than 2.1 % difference) confirms the fitness of the two approaches.

TABLE 2-1
DEMANDS - ACTUAL 2015

Use Type	Level of Treatment	Volume (AF)
Single family	Drinking Water	5,266
Multi-family	Drinking Water	3,245
Commercial	Drinking Water	2,994
Institutional	Drinking Water	420
Industrial	Drinking Water, Untreated	364
Irrigation	Drinking Water, Untreated	399
Other	Drinking Water	59
Unaccounted water[1]	Drinking Water, Untreated	1,628
Total Potable and Untreated Water Production [2]		*14,375*
Recycled Water	Recycled Water	606
	Total Water Demand	**14,981**

Notes:
2015 demand from billing records = 13,353 AF (includes recycled water)
[1] 2015 production minus 2015 demand (excludes recycled water)
[2] From production source report (does not include recycled water)

2.3 Existing and Target Per Capita Water Use

2.3.1 Base Daily Per Capita Water Use for SBX7-7 Reduction

The Water Conservation Bill of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the *20 by 2020 Water Conservation Plan*. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish water use targets in gallons per capita per day (GPCD), and compare actual water use against the target; reporting began with the 2010 UWMP. The primary calculations required by SBX7-7 are summarized in Table 2-2.

In the 2015 UWMP a water agency must demonstrate compliance with the target established for 2015 and demonstrate that the agency is on track to achieve its 2020 target. Compliance is done through review of the SBX7-7 Verification Tables submitted with the 2015 Plan (included as Appendix F).

Ventura Water first reported its Base Daily Water Use in its 2010 UWMP. However, at the time the 2010 UWMP was prepared full 2010 Census data was not available. Ventura Water is therefore required to redo the Base Daily Water Use calculation in this UWMP.

TABLE 2-2
SBX7-7 CALCULATION

	2010 UWMP	2015 UWMP	2020 UWMP
Base Daily Water Use calculation (average GPCD used in past years)	First calculated and reported in 2010 plan	May be revised in 2015 Plan, must be revised if 2010 Census data not used in original calculation	NA
Interim Water Use Target (target GPCD in 2015)	First calculated and reported in 2010 plan	May be revised in 2015 Plan, must be revised if 2010 Census data not used in original calculation	NA
Compliance Water Use Target (target GPCD in 2020)	First calculated and reported in 2010 plan	May be revised in 2015 Plan, must be revised if 2010 Census data not used in original calculation	NA
Actual 2015 Water Use (in GPCD)	NA	In 2015 Plan must compare actual 2015 GPCD against 2015 target	NA
Actual 2020 Water Use (in GPCD)	NA	NA	In 2020 Plan must compare actual 2020 GPCD against 2020 target

The Base Daily Water Use calculation is based on gross water use by an agency in each year and can be based on a ten-year average ending no earlier than 2004 and no later than 2010, or a 15-year average if ten percent of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage

It is at an agency's discretion whether or not to exclude agricultural water use from the Base Daily Water Use calculation. If agricultural water use is excluded from the Base Daily Water Use calculation it must also be excluded from the calculation of actual water use in later urban water management plans. Ventura Water did not supply water to agriculture during the period 1995 to 2010 and so agricultural water does not factor into the SBX7-7 calculations.

An urban retail water supplier must set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's baseline per capita daily water use
2. Per capita daily water use estimated using the sum of the following:
    a. For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20 percent reduction target, this standard may be adjusted by the Legislature by statute.
    b. For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992.
    c. For Commercial, Industrial, and Institutional uses, a ten percent reduction in water use from the baseline water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft 20 by 2020 Water Conservation Plan. Ventura Water falls within the South Coast Hydrologic Region (95% of the target for this region is 142 GPCD).
4. Reduce the 10 or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
    a. Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "BMP Calculator".
    b. A 20 percent savings on all unmetered uses.
    c. A 10 percent savings on baseline CII use.
    d. A 21.6 percent savings on current landscape and water loss uses.

The Interim Water Use Target is set as a halfway point between the Base Daily Water Use GPCD and the 2020 Compliance Water Use Target GPCD.

Finally, the selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable GPCD". The Maximum Allowable GPCD is based on 95 percent of a 5-year average base gross water use ending no earlier than 2007 and no later than 2010. The Maximum Allowable GPCD use is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction of the SBX7-7 legislation. If an agency's Compliance Water Use Target is higher than the Maximum Allowable GPCD, the agency must instead use the Maximum Allowable GPCD as its target.

2.3.2 Base Daily Per Capita Water Use

Tables 2-3 and 2-4 summarize the Base Daily Water Use calculation for Ventura Water. As is shown in these tables, the City is not eligible to use a 15-year base period. Years 1995 to 2004

have been selected for calculation of the 10-year base period while years 2003 to 2007 have been selected for calculation of the 5-year base period.

TABLE 2-3
BASELINE PERIOD RANGES

Baseline	Parameter	Value	Units
10 to 15 year baseline period	2008 total water deliveries	19,234	AFY
	2008 total volume of delivered recycled water	625	AFY
	2008 recycled water as a percent of total deliveries	3.2 %	Percent
	Number of years in baseline period[1]	10	Years
	Year beginning baseline period range	1995	-
	Year ending baseline period range[2]	2004	-
5 year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	-
	Year ending baseline period range[3]	2007	-

Notes:
Data is for Fiscal Year
[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a contiguous 10-year period. If the amount of recycled water delivered in 2007 is 10 percent or greater, the first baseline period is a contiguous 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.

In order to calculate Base Daily Per Capita Water Use for past years, it was necessary to develop population estimates for past years. To simplify the analysis, Ventura Water chose to take advantage of the DWR online population tool. The population tool is DWR's preferred method for estimating population. The population for Ventura Water was estimated using the DWR online population tool.[7] Shapefiles documenting the City service area boundaries in 1990, 2000, 2010, and present (2015) were uploaded to the DWR Population Tool. The population tool then uses a Geographic Information System (GIS) interface to compare the service area boundary against Census tract information and estimates population in Census years. The tool estimates a growth rate between Census Years and applies this to get population in non-Census years.

As shown in the top portion of Table 2-4, the Ventura Water Baseline GPCD is estimated to be 176. As shown in the second portion of Table 2-4, the Ventura Water 5-year Baseline GPCD is 167.

[7] https://wuedata.water.ca.gov/secure/login.asp?msg=inactivity&referer=%2Fsecure%2FDefault%2Easp?

TABLE 2-4
GALLONS PER CAPITA PER DAY

	Year	Service Area Population [1]	Gross Water Use (AFY)	Gross Water Use (million gallons a day)	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD					
1	1995	96,334	18,060	16.12	167
2	1996	97,634	19,489	17.40	178
3	1997	98,950	19,851	17.72	179
4	1998	100,285	18,568	16.58	165
5	1999	101,637	20,703	18.48	182
6	2000	103,008	21,567	19.25	187
7	2001	103,610	18,960	16.93	163
8	2002	104,216	19,933	17.80	171
9	2003	104,825	20,394	18.21	174
10	2004	105,437	22,298	19.91	189
10 to 15 Year Average Baseline GPCD					**176**
5 Year Baseline GPCD					
	Year	**Service Area Population [1]**	**Gross Water Use (AF)**	**Gross Water Use (million gallons a day)**	**Daily Per Capita Water Use (GPCD)**
1	2003	104,825	20,394	18.21	174
2	2004	105,437	22,298	19.91	189
3	2005	106,053	19,594	17.49	165
4	2006	106,673	18,149	16.20	152
5	2007	107,297	18,926	16.90	157
5 Year Average Baseline GPCD					**167**
2015 Compliance Year GPCD					
	2015	110,007	14,375	12.83	**117**

[1] From DWR Population Tool

2.3.3 Compliance Water Use Targets

In addition to calculating base gross water use, the "20 by 2020" legislation requires that a retail water supplier identify its demand reduction targets. The methodologies for calculating demand reduction targets were described above. The City is choosing to meet SBX7-7 targets as an individual agency rather than as part of a regional alliance. Ventura Water has selected Method 3, achieving 95% of the applicable South Coast Hydrologic Region target. The South Coast Hydrologic Region target is 149 GPCD, 95% of this target is 142 GPCD.

As described earlier, the Maximum Allowable GPCD is 95 percent of the 5-year Baseline GPCD or 159. The Compliance Water Use Target, under Method 3 (142 GPCD) is less than the

Maximum Allowable GPCD and therefore no adjustments to the Compliance Water Use Target are needed. This makes Ventura Water's Compliance (2020) Water Use Target 142 GPCD. The Interim (2015) Water Use Target is 159 GPCD. These calculations are summarized in Table 2-5.

TABLE 2-5
WATER USE TARGET CALCULATION - METHOD 3

Selected 10-year Average Base Daily Water Use	176	GPCD
Selected 5-year Average Base Daily Water Use	167	GPCD
Compliance Water Use Target (95% South Coast Target)	142	GPCD
Maximum Allowable Water Use Target (5% Reduction on 5-year Baseline GPCD)	159	GPCD
2015 Target	159	GPCD
2020 Target	142	GPCD

2.3.4 Achievement of Interim Target

Ventura Water's 2015 GPCD was calculated by using the DWR Population Tool. The DWR Population Tool assumes persons per connection in 2015 is the same as in 2010. Using information on residential connections in 2015, the tool estimated the 2015 population in the service area. As shown in Table 2-4, Ventura Water had a 2015 GPCD of 117, which means the City has exceeded the reductions required by the 2015 Interim Target (159 GPCD) and the 2020 Compliance Water Use Target (142 GPCD).

Ventura Water recognizes that 2015 was an exceptional year in terms of drought and Ventura Water customers responded through reduced water use. Ventura Water intends to keep GPCD low by continuing to encourage water conservation, by expanding opportunities for new recycled water use customers in the service area, and through potable reuse.

2.4 Projected Water Use

2.4.1 Normal Year

Projected water demands in a normal year are shown in Table 2-6. Table 2-6 provides estimates of demands in each year from 2020 to 2040 assuming growth in the service area consistent with the City General Plan (see Section 1.6) and assuming water demand grows at a similar rate to population. Projections assume similar customer water use as occurred 2005 to 2014. Year 2015 water usage was not included in the basis for projections as it was an extremely dry year and the City and its residents were asked to achieve extraordinary reductions in water use. In April 2015 Governor Brown issued Executive Order B-29-15. Key provisions included ordering the State Water Resources Control Board to impose statewide restrictions to achieve a 25 percent reduction in potable urban water usage through February 28, 2016. In response to the drought in February 2014 the City Council called for 10 percent voluntary conservation, followed by the September 2014 City Council declaration of a Stage 3 Water Emergency requiring customers to reduce their water use by 20 percent. In addition, in June 2015 the City Council approved a four-tiered (drought) water rate structure. It is expected

that the aggressive conservation and low demands seen in 2015 will not continue after drought conditions end.

The water projections in Table 2-6 are higher than projections contained in the City's annual Comprehensive Water Resources Reports. This difference is to be expected as the Draft 2016 Comprehensive Water Resources Report includes demand estimates based only on approved projects that would be fully vested by year 2024 and estimates demands to year 2030 using a growth rate of 0.55 percent. In addition drought years are included in the baseline demand used in the Comprehensive Water Resources Report. The projections in Table 2-6 assume a "normal" water year. In a normal water year it is assumed that Drought Water Rates are no longer in effect and that various drought shortage restrictions are lifted. Demand in dry-years is considered in the section below.

TABLE 2-6
PROJECTED WATER USE 2020 TO 2040 - NORMAL YEAR (AF)

Use Type	2020	2025	2030	2035	2040
Potable and Untreated Water Demand					
Single family	7,116	7,314	7,518	7,727	7,941
Multi-family	4,385	4,507	4,632	4,761	4,894
Commercial	4,046	4,159	4,274	4,393	4,515
Institutional	568	583	600	616	633
Industrial	492	506	520	534	549
Irrigation	658	676	695	715	734
Other	80	82	84	87	89
Unaccounted water [1]	2,200	2,261	2,324	2,389	2,455
Total Potable and Untreated Water Demand	*19,545*	*20,088*	*20,647*	*21,222*	*21,810*
Recycled Water [2]	700	842	865	889	914
Total Water Demand	**20,245**	**20,930**	**21,512**	**22,111**	**22,724**

Notes:
[1] Unaccounted water assumed to grow at the same rate as water overall demands
[2] Recycled water demands assumed to grow at the same rate as overall water demands. Recycled water use assumed the lesser of recycled water demand or recycled water supply.

2.4.2 Dry Years

2.4.3 Weather Effects on Water Usage

Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool-wet years, historical water usage has decreased to reflect less water usage for external landscaping.

California faces the prospect of significant water management challenges due to a variety of issues including population growth, regulatory restrictions and climate change. Climate change is of special concern because of the range of possibilities and their potential impacts on water supplies. The most likely scenarios involve accelerated sea level rise and increased temperatures, which will shift more runoff to winter months. The other much-discussed climate

scenario or impact is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers[8].

However, the probability that water use will increase during dry conditions is countered by conservation actions, including drought rates, that may be implemented by Ventura Water, as has been done in the recent drought (2012 to present). Over the past decade the water use per person (in GPCD) in the City's service area has seen a consistent decline. After requesting a 10 percent voluntary conservation by customers in February 2014, followed in September 2014 with a Stage 3 Water Shortage declaration, implementing customer outreach and customer rebate programs, and applying drought rates, Ventura Water experienced a 19 percent decline in water demand from calendar year 2015 compared to calendar year 2013. More information on Ventura Water's demand management programs can be found in Chapter 6 of this UWMP. Table 2-7 projects demands during dry years and it is assumed that demands will be the same as in a normal year (Table 2-6).

TABLE 2-7
PROJECTED WATER USE 2020 TO 2040 - DRY YEAR (AF)

Use Type	2020	2025	2030	2035	2040
Potable and Untreated Water Demand					
Single family	7,116	7,314	7,518	7,727	7,941
Multi-family	4,385	4,507	4,632	4,761	4,894
Commercial	4,046	4,159	4,274	4,393	4,515
Institutional	568	583	600	616	633
Industrial	492	506	520	534	549
Irrigation	658	676	695	715	734
Other	80	82	84	87	89
Unaccounted water [1]	2,200	2,261	2,324	2,389	2,455
Total Potable and Untreated Water Demand	*19,545*	*20,088*	*20,647*	*21,222*	*21,810*
Recycled Water [2]	700	842	865	889	914
Total Water Demand	**20,245**	**20,930**	**21,512**	**22,111**	**22,724**

Notes:
[1] Unaccounted water assumed to grow at the same rate as water overall demands
[2] Recycled water demands assumed to grow at the same rate as overall water demands. Recycled water use assumed the lesser of recycled water demand or recycled water supply.

2.5 Low Income Projected Water Demands

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The City of Ventura last updated its Housing Element in September 2013 for the 2014-2021 5th cycle of Regional Housing Needs Assessment (RHNA). The City Housing Element projects that 40 percent of households to be low-income (extremely low/very low/low)[9]. Despite this, the Housing Element does not provide any information that can be used to develop trends

[8] Final California Water Plan Update 2009 Integrated Water Management: Bulletin 160.
[9] City of San Buenaventura General Plan Housing Element Update. September 2013 Housing Element Technical Report, Page 2-39, Chart 2-26.

to calculate the associated water demand specific to low income households in the Ventura Water service area.

Table 2-8 makes an estimate of future low-income household water demands in the Ventura Water service area. Table 2-8 assumes a similar occurrence of low-income households in the water service area as in the City of Ventura (i.e., 40 percent). These demands are included (and are not in addition to) the water demands described in Tables 2-6 and 2-7.

Ventura Water will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- the City specifically finds that it does not have sufficient water supply
- the City is subject to a compliance order issued by the Division of Drinking Water Services that prohibits new water connections
- the applicant has failed to agree to reasonable terms and conditions relating to the provision of services
- the City finds it is not in compliance with the City's current Water Shortage Event Contingency Plan

TABLE 2-8
PROJECTED WATER USE LOW INCOME HOUSEHOLDS (AF)

Water Use [a]	2020	2025	2030	2035	2040
Estimated Low-Income Household Water Use - Normal Year	4,601	4,729	4,860	4,995	5,134
Estimated Low-Income Household Water Use - Dry Years	4,601	4,729	4,860	4,995	5,134

Note:

a Assumes 40 percent all future households in Ventura Water service area qualify as "low" income per the definition provided in Senate Bill 1087.

Pursuant to Government Code Section 65589.7 the City is to grant priority for the provision of water and sewer services to proposed developments that include housing units affordable to lower income households.

Section 3: Water Resources

3.1 Overview

This section describes the water resources available to the City for the 25-year period covered by the Plan. Both currently available and planned supplies are discussed.

There are presently six distinct water sources providing water to the City water system.

- Casitas Municipal Water District (Casitas)
- Ventura River Foster Park Area (Foster Park)
    - Surface Water Intake
    - Upper Ventura River Groundwater Basin/Subsurface Intake and Wells
- Mound Groundwater Basin
- Oxnard Plain Groundwater Basin (Fox Canyon Aquifer)
- Santa Paula Groundwater Basin
- Reclaimed water and reuse from the Ventura Water Reclamation Facility.

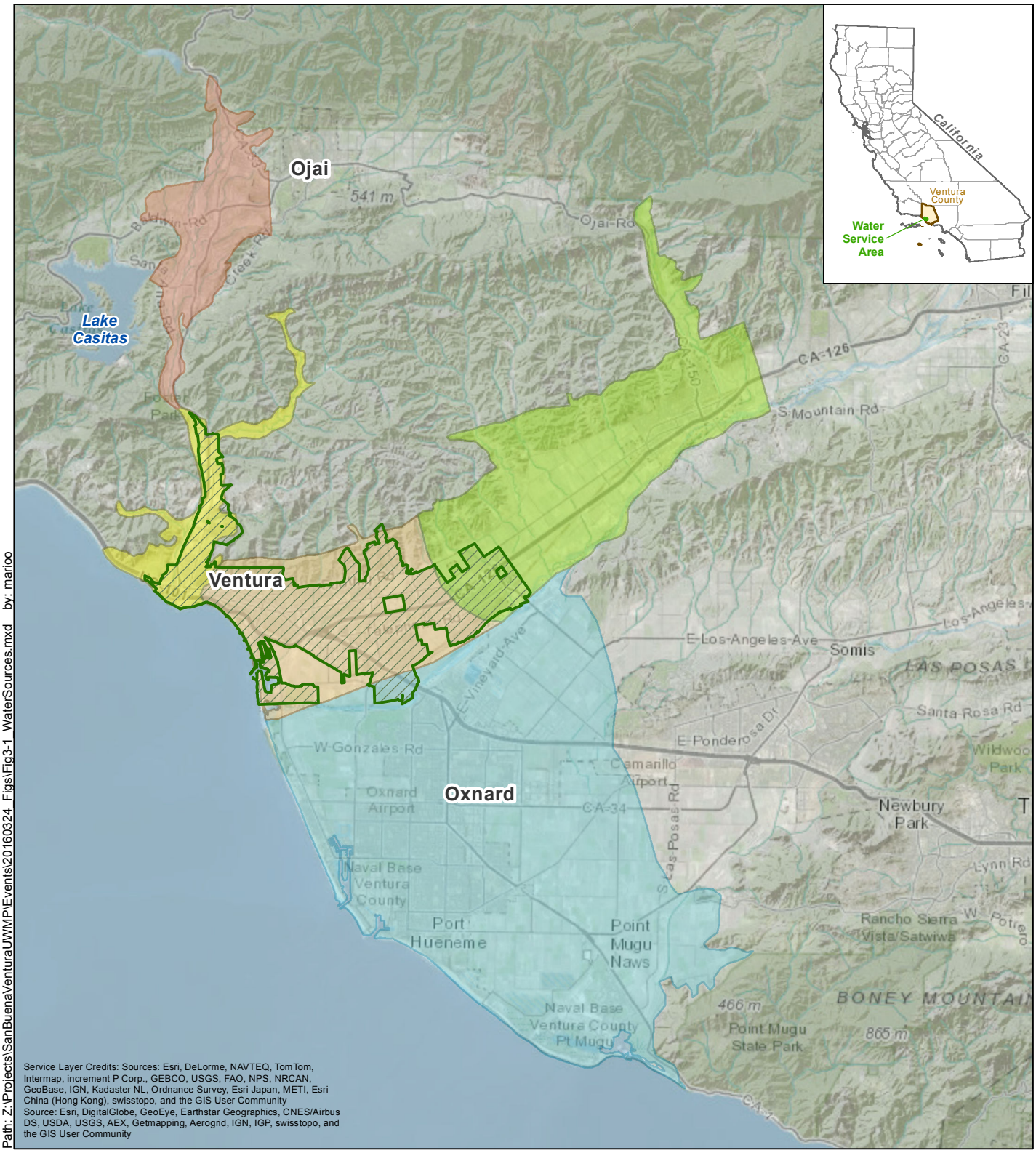
Figure 3-1 provides an overview of City water sources. In addition, the City has a 10,000 AFY contract amount from the California State Water Project, which is not utilized within the City service area because currently there are no facilities to deliver the water to the City.

3.2 Imported Supplies

The City has a contract Table A[10] Amount of 10,000 AFY of State Water Project (SWP) water with DWR. Currently SWP water is limited by the ability to deliver the water to the City. The following describes the history of this allocation and the potential for future use of SWP supply.

In 1964, Ventura County Flood Control District contracted with the State of California for future delivery of up to 20,000 AFY of SWP water to Ventura County. In 1971, administration of the contract for SWP water was assigned to Casitas. The City executed an agreement in 1971 with Casitas and DWR to allocate 10,000 AFY of the entitlement to the City. This obligation extends to 2035. In the contract with Casitas, the City retains full authority and responsibility for advance scheduling of its SWP water and for determining the point and method of delivery. To date, the City has not received delivery of its annual SWP allocations, and it is not certain if or

[10] Each SWP contractor's SWP Water Supply Contract includes a "Table A," which lists the maximum amount of water an agency is entitled to throughout the life of the contract. The Table A amount is each contractor's proportionate share, or "allocation," of the SWP water supply. However, how much SWP water is available each year varies based mainly on the amount of precipitation.



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Legend

- Water Service Area

Groundwater Basin

- Lower Ventura River
- Mound
- Oxnard Plain
- Santa Paula
- Upper Ventura River

N

0 10,000 20,000

Scale: Feet

Kennedy/Jenks Consultants

City of Ventura UWMP
Ventura, CA

Water Sources

KJ 1644212*00
March 2016

Figure 3-1

when facilities would ever be constructed to transport SWP water to the City. In 1999, the City became a signatory to the SWP Monterey Amendment Settlement Agreement. The Monterey Amendment allows the City and other SWP contractors to sell surplus allocated water back to the SWP pool of supplies.

The City, Casitas, and United (referred to as the Joint Agencies) pay annual contractual fees to DWR, which cover construction costs for SWP facilities and administration to deliver allocations of water throughout the state. The City Attorney's review of the City's SWP contract indicates that the City cannot unilaterally end its involvement in the SWP financial obligations without great risk.

The Monterey Amendment Settlement Agreement to the SWP contracts in 1999 provided the City a formal mechanism to allow it to place its annual SWP water allocation into a "turn back" pool to be purchased by other SWP contractors. The City has taken part in the "turn back" pool over the past several years, which has allowed the City to recoup a small part of its annual SWP payment obligation. The City has also worked with United, which requests (depending on local hydrologic conditions and percent of SWP water available each year) some portion of the City's annual allocation at the "turn back" pool rate. This provides water recharge benefits to the County area as a whole. As stated previously, this obligation extends to 2035 but also includes an extension option. Casitas is the lead agency and is working with the State on an extension through approximately 2085, a process that is expected to take a few years to negotiate.

State Water can be wheeled through the Metropolitan Water District of Southern California and Calleguas Municipal Water District, however, it would be costly and the necessary agreements have not been negotiated. The City continues to discuss potential intertie projects with other local agencies and a Water Intertie Project is included in the City's current Capital Improvement Program. In the interim, in June 2013, Council authorized the City's 10,000 AF of SWP allocation to be sold in the State's Multi-Year Water Pool Demonstration Program. The Program provides flexibility in pricing and greater return on the City's investment then the traditional pool. There is no minimum supply volume guarantee for the City's SWP water and it has become a less reliable source in the past several years, especially during drought periods. Therefore, for the purposes of this UWMP, the volume assigned to SWP will be zero during the planning period. SWP water is assumed to be a future emergency supply.

3.3 Local Surface Water

3.3.1.1 Casitas Municipal Water District (Casitas)

Casitas operates and maintains the Ventura River Project, a part of which is the 254,000 AF capacity storage reservoir known as Lake Casitas. Casitas diverts and stores storm water runoff to Lake Casitas for subsequent filtration treatment and supply of potable water to agricultural and urban uses in western Ventura County. The Casitas service area includes the Ojai Valley, the western part of the City, Oak View, Upper Ojai Valley, and the coastal area between the City and Santa Barbara County.

In July 1995, the City signed the current operating agreement with Casitas, establishing the City's minimum annual purchase at 6,000 AFY, which is subject to the allocation program described below during drought periods. While additional supply (up to 8,000 AFY) may be

available to the City in future years, the present annual supply primarily used within the Casitas district boundary of the City service system is approximately 5,815 AFY (annual average for the last 10 years, 2005 to 2014).

The estimated normal year supply based on population growth within the Casitas district boundary served by the City of Ventura water service area is 5,700 to 6,400 AFY. These numbers have been provided to Casitas and have been incorporated into Casitas' own planning estimates.

The safe yield of Lake Casitas was last calculated and published by Casitas in the 2004 Water Supply and Use Status Report, specifically page 5 of the report. The safe yield calculation considered the operation of the RObles Diversion and Fish Passage Facility under the requirements of the Biological Opinion Criteria and the loss of the Matilija Dam operation, resulting in a reduction of safe yield to 20,840 AFY for the critical drought period of 1945 to 1965.[11]

To maintain the future operation of Lake Casitas at safe yield, in 1992 Casitas established an allocation program for its customers. Consistent with the City's 1995 Agreement with Casitas, the City's allocation can be as high as 8,000 AFY and can be incrementally reduced during dry weather conditions as Lake Casitas storage drops. In 2015, upon the continuation of a multiple year drought, Casitas has not imposed additional cutbacks to the City's allocation. Casitas has requested their customers reduce their water usage by 20 percent based on the State's Drought Emergency Regulations.

TABLE 3-1
ESTIMATED SUPPLY FROM CASITAS MUNICIPAL WATER DISTRICT (AFY)

	2020	2025	2030	2035	2040
Normal Year	5,741	5,901	6,065	6,233	6,407
Single-Dry Year	5,741	5,901	6,065	6,233	6,407
Multiple-Dry Year	4,593	4,720	4,852	4,987	5,125

Notes:
Water from Casitas Municipal Water District is primarily used by City customers that are within that agency's boundaries. Therefore supply is the lesser of (a) water available from Lake Casitas or (b) demand in that City service area that is also within the Casitas service area. Demand in Casitas service area assumed to be average demand 2010 to 2014, with 0.55 growth rate.

3.3.1.2 Ventura River

Production from the Ventura River is a function of several factors including diversion capacity, local hydrology, environmental impacts, and the storage capacity of the Ventura River alluvium and upstream diversions. Currently all Ventura River water is collected using subsurface collectors and shallow wells, a surface intake structure at Foster Park is unused due to the natural channeling of the active river system bypassing the structure. In 2005 there was extreme storm damage to the City's Foster Park water production facilities and production from the Ventura River decreased dramatically. Between 2010 and 2014, annual production from the Ventura River averaged 3,051 AFY.

[11] Casitas Municipal Water District, *2004 Water Supply and Usage Report*, pg 5.

According to a model of the Ventura River developed in 1984 and modified in 1992, the Upper Ventura River Basin fills after one or more years of above average rainfall. Once full, it takes three successive years of drought (below-average rainfall) to deplete the river basin subsurface storage and cause river water production to drop until the drought ends. The Foster Park facilities produce water throughout the year. However, due to storm flows, the wells are subject to inundation and erosion.

In 2008, the City began conducting studies of Ventura River flow conditions in order to operate the Foster Park facilities in a more sustainable manner. The City is working towards developing a pumping regime that will balance production demands with environmental concerns. Presently, the City has voluntarily adopted a production schedule that limits its pumping based on annual rainfall conditions. Ventura Water intends to work with experts to ascertain a pumping regime that will balance production with environmental concerns and is presently studying the relationship between groundwater production and surface flows. Under current and future operational constraints supply from the Ventura River, in a normal year, is estimated to be 4,200 AFY.

In conjunction with the Matilija Dam Ecosystem Restoration Project, two additional wells were installed at Foster Park. The wells, identified as the Foster Park Wellfield Restoration Project Wells No. 12 and 13, are intended to mitigate for water lost as a result of increases in turbidity due to the future removal of Matilija Dam. To date these wells have not been activated and will not be operated until after removal of Matilija Dam necessitates their use. The wells will be operated in accordance with the National Marine Fisheries Biological Opinion for the Matilija Dam Ecosystem Restoration Project. It is anticipated that these new wells along with the installation of new wells to replace wells that were damaged in 2005, and expansion of the Avenue Treatment Plant to its maximum capacity will improve reliability of the Ventura River supply. These improvements are anticipated to restore historical production capabilities to produce up to 6,700 AFY in wet years.

The extended drought from 2012 to present has reduced supplies available from the Ventura River. In 2015, Ventura Water produced only 1,298 AF from the Ventura River. The improvements described above will enhance dry year supplies but will not compensate for reduced supplies due to droughts.

TABLE 3-2
ESTIMATED SUPPLY FROM VENTURA RIVER (AFY)

	2020	2025	2030	2035	2040
Normal	4,200	4,200	4,200	4,200	4,200
Single-Dry Year	4,200	4,200	4,200	4,200	4,200
Multiple-Dry Years	1,298	1,298	1,298	1,298	1,298

Note: Above normal hydrologic year could yield approximately 6,700 AF.

3.4 Groundwater

The City obtains water from three groundwater basins, which have historically provided roughly 10,000 AFY, or half of the City's total supply. Table 3-3 shows the historical production from these basins. These groundwater basins are described below.

TABLE 3-3
HISTORIC GROUNDWATER PRODUCTION (AFY)

Basin Name	Metered or Unmetered	2011	2012	2013	2014	2015
Mound Basin	Metered	1,424	2,795	3,314	3,220	2,324
Oxnard Plain Basin	Metered	4,817	5,601	5,491	4,565	3,587
Santa Paula Basin	Metered	733	755	673	629	2,318
	Total	*6,974*	*9,151*	*9,478*	*8,414*	*8,229*
Groundwater as a % of Total Supply		42.28%	52.65%	53.52%	51.12%	57.25%

The City has being operating its water supply system by utilizing a conjunctive use operating procedure. The procedure involves utilizing surface water (such as the Ventura River) during wet years to the fullest extent possible while letting groundwater sources rest. During dry years when the surface water source is reduced, the groundwater sources are pumped to meet demands.

Conjunctive use of the City's existing groundwater sources is limited by the requirement to maintain long-term production from the groundwater basins within their safe or operational yield. Conjunctive use of groundwater requires treatment and blending ratios to meet water quality goals.

Conjunctive Use of potential future supply sources may include potable reuse, desalination or State Water or a combination of these future supplies banked in the existing groundwater basins for extraction in dry and/or multiple-dry years.

3.4.1.1 Mound Groundwater Basin

The Mound Groundwater Basin is identified in DWR Bulletin 118, 2003 Update as the Mound Subbasin of the Santa Clara River Valley Groundwater Basin (Basin No. 4-4.03). The basin underlies the northern part of the Ventura coastal plain and is bounded on the north by the Santa Ynez and Topa Topa Mountains, on the south by the Oak Ridge and Saticoy faults, the northeast by the Santa Paula Subbasin, and the west by the Pacific Ocean. Historical agricultural and private well uses have typically extracted about 2,000 AFY[12] while the City's average annual extraction for the last ten years (2005-2014) has been approximately 2,973 AFY. Historical use has been documented to temporarily exceed the yield of the basin and result in water levels that have fallen below sea level and created the threat of seawater intrusion. To abate this threat, the City abandoned its coastal well facilities and located groundwater extraction near the center of the Mound Basin.

[12] City of San Buenaventura Water Master Plan, 2011. Page V-7.

The City operates wells in the Mound Basin under the findings of a 1996 study[13] (provided in Appendix G). The 1996 study of the basin indicated that historical data supports a basin yield of at least 8,000 AFY during drought conditions as long as pumpage is reduced during wet years to allow water levels to recover[14]. The basin is not in overdraft.

Currently, two wells supply the City water from the Mound Groundwater Basin; Victoria Well No. 2, which was installed in 1995 and Mound Well No. 1, which began production in April 2003. Victoria Well No. 1, which was installed in 1982, is considered an inactive well at this time due to maintenance and water quality issues and is scheduled for destruction. Water quality is highly mineralized in the Mound Basin and blending with lower TDS water is required by DDW. The City's reliable supply from the Mound Basin is 4,000 AFY in normal and single-dry years. In multiple-dry years the City estimates it will utilize 6,000 AF from the Mound Basin due to conjunctive use (utilizing storage in the Mound Basin) as mentioned above. Additional wells will be constructed in the Mound Groundwater Basin to provide redundancy and backup. Mound wells number 2 and 3 are currently being designed and scheduled to be operational by no later than 2020.

The Mound Groundwater Basin is within the boundary of the United Water Conservation District (United). United was formed in 1950 under the State of California's Water Conservation District Law of 1931, and is organized as a governmental special district. United serves as the conservator of the groundwater resources that include a major portion of the Mound Groundwater Basin. United does not produce water from the basin, but is authorized to engage in groundwater replenishment of the basin.

The Sustainable Groundwater Management Act (SGMA) passed in 2014 and amended in 2015 creates a framework for sustainable, local groundwater management in California. SGMA directed the Department of Water Resources to identify priority groundwater basins for the purpose of implementing SGMA. SGMA requirements to create sustainable groundwater management agencies and sustainable groundwater management plans applies only to high and medium priority basins. The Mound Basin is a medium priority basin. The first action required by the legislation is for Groundwater Sustainability Agencies to be identified. Through a memorandum of understanding, the City, Ventura County, and United have agreed to negotiate diligently and in good faith with one another in order to develop a mutually acceptable agreement to form a groundwater sustainability agency for the Mound Basin. This effort will include preparation of governance structures, assignment of roles and responsibilities, preparation of bylaws, preparation of financial cost sharing, and the publication of notices. The State mandated deadline to form a Groundwater Sustainability Agency is June 30, 2017. The State mandated deadline to complete a Groundwater Sustainability Plan is January 31, 2022. Though it is expected that creation of the Groundwater Sustainability Agency will affect management of the Mound Basin, based on past studies the City anticipates a reliable supply from the Mound Basin of 4,000 to 6,000 AFY. However, this will be re-evaluated in future UWMPs.

3.4.1.2 Oxnard Plain Groundwater Basin

The Oxnard Plain Groundwater Basin is identified in DWR Bulletin 118, 2003 Update as the Oxnard Subbasin of the Santa Clara River Valley Basin (Basin No. 4-4.02), located in southern

[13] Fugro West, Inc. June 1997. "Mound Groundwater Basin Annual Report".
[14] Ibid

Ventura County. The basin is bounded on the north by the Oak Ridge fault, the south by the Santa Monica Mountains, the east by the Pleasant Valley and Las Posas Valley Basins, and the west by the Pacific Ocean. Average annual yield from the City's Golf Course wells over the past 10 years has been about 5,300 AFY.

Wells near the Buenaventura Golf Course have drawn from the Oxnard Plain Groundwater Basin since 1961. Currently, two wells, Golf Course Wells Nos. 5 and 6, produce potable water for the City's system. These wells pump from the Fox Canyon aquifer of the Oxnard Plain Groundwater Basin. A third well (Golf Course Well No. 7) is currently under construction. This third new well will operate as the primary well with Wells Nos. 5 and 6 providing redundancy and backup. Golf Course Well No. 7 is scheduled to be in service by 2017. Raw water quality data indicates that wells from this basin have better raw water quality than wells located within the Mound Basin.

The Oxnard Plain Groundwater Basin is managed by the Fox Canyon Groundwater Management Agency (FCGMA), which was created by state legislation in an effort to reduce overdraft and stop seawater intrusion. The FCGMA's 2007 Update to the Fox Canyon Groundwater Management Plan is included in Appendix F. In August 1990, FCGMA passed Ordinance No. 5 which required existing groundwater users to reduce their extractions by five percent every five years until a 25 percent reduction was reached by year 2010. The City's historical allocation was set by FCGMA at 5,472 AFY, which was the average extraction from City wells for the period 1985 to 1989. From 1992 to 2010 the City's allocation was reduced three times. In 2010 the City's allocation was set at 4,104 AFY. In years when the City does not use its full allocation it can accrue conservation credits. As of December 2015 the City had accumulated 25,000 AF of credits. The City has utilized approximately 1,000 AF of conservation credits each of the last 10 years. The City considers 4,100 AFY to be its normal water year supply from the Oxnard Plain Groundwater Basin.

After several special meetings in the first few months of 2014 and several iterations of an emergency ordinance, the FCGMA Board approved Emergency Ordinance E at a Special Meeting on April 11, 2014. The emergency ordinance limits extractions from groundwater within the FCGMA boundary, suspends use of credits and prohibits the issuance of any permit for construction of a groundwater extraction facility, other than a replacement, backup or standby facility which does not allow the initiation of any new or increased use of groundwater within the territory of the Agency. The City's allocation has been limited to 3,862 AFY. The City will pay surcharges for exceeding its allocations because the City may not rely on its conservation credits that were set aside during wet years. On June 14, 2014, the City requested a variance to its allocation per Ordinance E and was denied by FCGMA staff. The City then made an appeal to the FCGMA Board on January 28, 2015, and was denied by the FCGMA Board. Key points presented by FCGMA for Emergency Ordinance E were as follows:

- The FCGMA Act goal of safe yield by 2010 not being met,
- The 2007 Groundwater Management Plan Basin Management Objectives not being met,
- Water level declines in all basins,
- The unsustainability of the current Agency allocation scheme,
- Increase in time of planted acres of water intensive crops, and
- The continued unabated threat to the resource (seawater intrusion, water quality degradation, land subsidence)

For all Municipal and Institutional (M&I) Operators the Temporary Extraction Allocation (TEA) is based on an operators average annual reported extractions, for CY2003 through 2012. Phase reductions were set beginning July 1, 2014 with a 20 percent total reduction of the TEA on January 1, 2016. The City's TEA was 4,827 AFY and with the phased reductions is 3,862 AFY as of January 1, 2016. This equates to a reduction of approximately 29 percent from the previous historical baseline allocation of 5,472 AFY.

The duration of the ordinance remains in effect from the date of adoption and reviewed every eighteen months, unless superseded or rescinded by action of the FCGMA Board or a finding by the FCGMA Board that the drought or emergency condition no longer exists.

For the purposes of the UWMP, the Emergency E allocation in 2016 in the amount of 3,862 AF, is being treated as representative of the supply from the Oxnard Plain during a single dry or multiple dry years.

FCGMA was named as the Groundwater Sustainability Agency for the Oxnard Plain, as well as other groundwater basins, in the SGMA legislation. Ventura Water will continue to act as a stakeholder as FCGMA develops its Groundwater Sustainability Plan.

3.4.1.3 Santa Paula Groundwater Basin

The Santa Paula Groundwater Basin is identified in DWR Bulletin 118, 2003 Update as the Santa Paula Subbasin (Basin No.4-4.04). The basin is bound on the north by the Topa Topa Mountains, the south by the Oak Ridge and South Mountain, the Oak Ridge fault, and the Saticoy fault, the east by a bedrock constriction, and the west by the Oxnard Plain and Mound subbasins. Water from the Santa Paula Basin is extracted through Saticoy Wells 2 and 3, with a peak pumping capacity of 3,000 GPM. This water is treated by an iron-manganese conditioning facility. Water quality is about the same as the Oxnard Plain Basin.

The management of the Santa Paula Basin was established under a court stipulated judgement (provided in Appendix I). United, the Santa Paula Basin Pumpers Association and the City are all parties to the Judgement. In summary, the Judgment adjudicates groundwater rights, regulates individual and collective pumping, provides for basin management through a Technical Advisory Committee (TAC), and reserves jurisdiction in the Superior Court to resolve future disputes and provide for supplementary orders as necessary. Because the Santa Paula Basin is already managed per a stipulated judgment, it is exempt from the provisions of SGMA.

Under the Judgement the City is allowed to pump an average of 3,000 AFY. The City is not limited to this allocation in any single year, but may produce seven times its average annual allocation (21,000 AF) over any running seven-year period. In addition, the City may pump an additional 3,000 AFY in case of an emergency resulting from a long-term drought situation if additional treatment capacity is added. Over time the City has acquired pumping rights from others in the basin and this has brought the City's allocation up to 3,006 AFY.

If the monitoring performed by the TAC determines that groundwater safe yield is being exceeded, then the City may have its pumping allocation reduced. The Judgement describes six "Overdraft" stages and requires reduced production at each stage.

- Stage 1: All uses in excess of the pumping allocation shall be cut back.

- Stage 2: Affects the pumping allocation of the Santa Paula Basin Pumpers Association and not the City.
- Stage 3: City of Ventura pumping limited to 1,141 AF.
- Stage 4: City of Ventura pumping limited to 641 AFY
- Stage 5: City of Ventura must cease pumping from the Santa Paula Basin

Throughout the drought of 2012 to 2015 Ventura Water took an average of 1,071 AF; in 2016 Ventura Water anticipates that the TAC may determine a Stage 3 shortage and limit Ventura Water to 1,147 AF from the Santa Paula Basin (1,141 plus six additional AF of recently acquired water rights). For the purposes of the UWMP, a Stage 3 shortage per the Judgement is being treated as representative of the supply from the Santa Paula Basin during a multiple-dry year.

3.4.1.4 Groundwater Supplies Normal, Single-Dry and Multiple Dry Year

Table 3-4 depicts the anticipated groundwater supplies during Normal, Single-Dry, and Multiple Dry Years, by groundwater source.

TABLE 3-4
PROJECTED GROUNDWATER SUPPLIES FOR DIFFERENT YEAR TYPES (AFY)

	2020	2025	2030	2035	2040
Normal Year					
Mound Basin	4,000	4,000	4,000	4,000	4,000
Oxnard Plain Basin	4,100	4,100	4,100	4,100	4,100
Santa Paula Basin	3,006	3,006	3,006	3,006	3,006
Total Normal Year	*11,106*	*11,106*	*11,106*	*11,106*	*11,106*
Single-Dry Year					
Mound Basin	4,000	4,000	4,000	4,000	4,000
Oxnard Plain Basin	3,862	3,862	3,862	3,862	3,862
Santa Paula Basin	3,006	3,006	3,006	3,006	3,006
Total Single-Dry Year	*10,868*	*10,868*	*10,868*	*10,868*	*10,868*
Multiple-Dry Years					
Mound Basin	6,000	6,000	6,000	6,000	6,000
Oxnard Plain Basin	3,862	3,862	3,862	3,862	3,862
Santa Paula Basin	1,147	1,147	1,147	1,147	1,147
Total Multiple-Dry Year	*11,009*	*11,009*	*11,009*	*11,009*	*11,009*

Note:
In multiple dry years additional groundwater is utilized to meet demands when surface water supplies are reduced (conjunctive use).

3.5 Recycled Water and Reuse

Recycled water is a current and future source for Ventura Water. Recycled water is detailed in Chapter 4.

3.6 Transfers, Exchanges and Groundwater Banking Programs

Additional water supplies can be purchased from other water agencies and sources, and the City is currently exploring opportunities. An important element to enhancing the long-term reliability of the total mix of supplies currently available to meet the needs of the City is the use of transfers, exchanges, and groundwater banking programs, such as described below.

3.6.1.1 State Water Project Options

The City of Ventura has a 10,000 AFY contract portion of the Ventura County Watershed Protection District's 20,000 AFY SWP Table A Amount. At this time, the City does not have the facilities needed to deliver SWP water into its distribution system. The City's goal is to protect and to provide this water supply, while minimizing the financial impact of retaining the contract amount. Recent changes in regulations and the current market for SWP water has provided an opportunity for the City to consider a number of options, including short and/or long-term lease of its SWP supply. There is no minimum supply volume guarantee for the City's SWP water and so SWP supply is assumed to be a future emergency supply only.

3.7 Planned Water Supply Projects and Programs

Ventura Water anticipates that new and intensified development will increase demand for water. Since 2013, the City has recognized that consumption is nearing available supply. Consistent with Article X, Section 2 of the California Constitution, in order to mitigate the water resource impacts of new or intensified development, it is necessary and desirable for new or intensified development to provide supplemental water resources to the City water system in an amount proportional to the new demand or to pay a water resource fee based upon the cost of obtaining water supplies to meet the demand of new or intensified development. Upon direction from City Council, Ventura Water has prepared and evaluated a "Net Zero Policy". The Net Zero Policy was developed after months of review and input from the Ventura Water Commission. The Water Commission approved the Water Rights Dedication and Net Zero Fee Ordinance at the March 22, 2016 meeting and the Water Rights Dedication and Net Zero Fee Ordinance was presented to the City Council on April 11, 2016. Evaluation of the Net Zero Policy is found in the following documents (provided in Appendix J):

- Evaluation of a Water Resource Net Zero Fee Report
- Water Rights Dedication and Water Resource Net Zero Fee Nexus Report

A final draft of the Net Zero Policy is also provided in Appendix J. The proposed water resources fee is based on valuation of several planned water supply projects that would improve the City's water supply, as described in the paragraphs below and in Table 3-5.

- Foster Park Wellfield Production Restoration. Production wells at Foster Park were destroyed during the 1998, 2001, and 2005 storm events. The existing surface diversion facility is no longer functional due to the Ventura River changing its course and the environmental issues associated with diverting the river. In the near term, this project consists of the design and construction of one new water production well and production enhancements to existing production facilities, including the existing subsurface collector. Design and construction will also include a pipeline to tie the new well into the existing transmission pipe, electrical and control systems for automating the new well,

and any required mitigation measures for constructing the new well. Longer term improvements include construction of additional wells and a new transmission line that will cross beneath the river to supplement the carrying capacity of the existing river crossing. Once completed, the new wells and associated facilities will be capable of producing an additional 2,500 AFY in normal hydrologic years. The project is scheduled to begin construction in 2018 with additional wells and other improvements in the following decade.

- Expansion of Recycled Water/Advanced Treatment Potable Reuse. This project is to expand the Ventura Water Reclamation Facility and then utilize the highly treated water from this facility for water supply. The annual delivery capacity of this project is a range from 2,381 to 3,898 AFY. This project is scheduled to be in operation by the end of 2025.

- Pure Water Pipelines. This is a project to provide distribution infrastructure for potential indirect potable reuse or potential direct potable reuse. This includes a pipeline from the wastewater reclamation facility of approximately 10 miles to the Bailey and Saticoy treatment plants for blending with groundwater supplies. The same pipelines would convey desalinated water if a desalination treatment plant is built in the future. This project is scheduled for completion during the 2021-2022 Fiscal Year.

- Ocean Desalination. Ocean desalination was preferred by the City voters in the November 1992 election, over State Water Project deliveries. However, this potential future supply was never developed and is not expected to be phased in until sometime after 2030. It is anticipated that a desalination facility could initially provide an additional 1,500 AFY during dry years and could be expanded after the year 2040.

- Brine Line Ocean Outfall. This project will convey brine from any groundwater treatment, potable reuse and/or desalination through an ocean outfall. This project will comprise an estimated mile long 24" pipeline off Ventura's coastline located near the Ventura Water Reclamation Facility. Construction of the outfall project is scheduled to begin in the 2021-2022 Fiscal Year and be completed by year 2023 at an estimated cost of $26 million.

TABLE 3-5
PLANNED WATER SUPPLIES (AFY)

	2020	2025	2030	2035	2040
Additional Recycled Water [1]	0	142	165	189	214
Potable Reuse	0	2,381	2,670	3,898	3,898
Ocean Desalination	0	0	0	1,500	1,500
Total New Planned Water Supply Projects	*0*	*2,523*	*2,835*	*5,587*	*5,612*

[1] Additional recycled water supply above the current recycled water supply of approximately 700 AF. See Table 2-6.

3.8 Anticipated Water Supply Sources in Normal, Single Dry, and Multiple Dry Years

Table 3-6 shows Ventura Water supplies in 2015. Tables 3-7, 3-8, and 3-9 provide details on supplies anticipated to be available to Ventura Water in average/normal, single-dry, and multiple dry years.

TABLE 3-6
WATER PRODUCTION CALENDAR YEAR 2015 (AF)

Water Supply Source	Volume (AF)	Type
Casitas Municipal Water District [a]	4,848	Drinking Water
Ventura River [b]	1,298	Drinking Water
Groundwater [c]	8,229	Drinking Water
Recycled Water [d]	606	Recycled Water
Total Supplies	**14,981**	

Notes:

a City records

b See Section 3.3.1.2

c See Section 3.4

d See Section 4.1

TABLE 3-7
WATER SUPPLY ESTIMATES - AVERAGE/NORMAL YEAR (AF)

Water Supply Source	2020	2025	2030	2035	2040
Casitas Municipal Water District [a]	5,741	5,901	6,065	6,233	6,407
Ventura River [b]	4,200	4,200	4,200	4,200	4,200
Groundwater [c]	11,106	11,106	11,106	11,106	11,106
Recycled Water [d]	700	700	700	700	700
Planned Additional Recycled Water [e]	0	142	165	189	214
Planned Potable Reuse [f]	0	2,381	2,670	3,898	3,898
Planned Ocean Desalination [f]	0	0	0	1,500	1,500
Total Supplies [g]	***21,747***	***24,430***	***24,906***	***27,826***	***28,025***

a See Table 3-1

b See Table 3-2

c See Table 3-4

d See Section 4.1

e See Table 3-5

f See Section 3.7

g Maximum supplies do not account for reduction to meet water quality objectives.

TABLE 3-8
WATER SUPPLY ESTIMATES - SINGLE-DRY YEAR (AF)

Water Supply Source	2020	2025	2030	2035	2040
Casitas Municipal Water District [a]	5,741	5,901	6,065	6,233	6,407
Ventura River [b]	4,200	4,200	4,200	4,200	4,200
Groundwater [c]	10,868	10,868	10,868	10,868	10,868
Recycled Water [d]	700	700	700	700	700
Planned Additional Recycled Water [e]	0	142	165	189	214
Planned Potable Reuse [f]	0	2,381	2,670	3,898	3,898
Planned Ocean Desalination [f]	0	0	0	1,500	1,500
Total Supplies [g]	***21,509***	***24,192***	***24,668***	***27,588***	***27,787***

a See Table 3-1

b See Table 3-2

c See Table 3-4

d See Section 4.1

e See Table 3-5

f See Section 3.7

g Maximum supplies do not account for reduction to meet water quality objectives.

TABLE 3-9
WATER SUPPLY ESTIMATES - MULTIPLE-DRY YEARS (AF)

Water Supply Source	2020	2025	2030	2035	2040
Casitas Municipal Water District [a]	4,593	4,720	4,852	4,987	5,125
Ventura River [b]	1,298	1,298	1,298	1,298	1,298
Groundwater [c]	11,009	11,009	11,009	11,009	11,009
Recycled Water [d]	700	700	700	700	700
Planned Additional Recycled Water [e]	0	142	165	189	214
Planned Potable Reuse [f]	0	2,381	2,670	3,898	3,898
Planned Ocean Desalination [f]	0	0	0	1,500	1,500
Total Supplies [g]	***17,600***	***20,250***	***20,694***	***23,581***	***23,744***

a See Table 3-1

b See Table 3-2

c See Table 3-4. Additional groundwater is used in multiple-dry years to make up for reduced surface water supply.

d See Section 4.1

e See Table 3-5

g See Section 3.7

g Maximum supplies do not account for reduction to meet water quality objectives.

Section 4: Recycled Water and Reuse

This section of the Plan describes the existing and future recycled water opportunities available to the City service area. The description includes estimates of potential supply and demand for 2010 to 2040 in five year increments, as well as The City's proposed incentives and optimization plan.

4.1 Recycled Water Planning

The City has access to recycled water supply through the Ventura Water Reclamation Facility (VWRF). The City has sole ownership in the wastewater treatment and water recycling facilities in its service area. Currently, the VWRF discharges most of its tertiary treated effluent to the Santa Clara River Estuary with approximately 700 AFY diverted as recycled water for landscape irrigation by several users.

The City's current and past recycled water planning efforts have centered on issues related to the beneficial uses of the Santa Clara River Estuary. These issues have required the City to consider whether or not discharge from the VWRF provides enhancements to the beneficial uses of the estuary, and this consequently affects the amount of recycled water that can supplement domestic water supply. The following describes the history and issues related to recycled water planning within the City's service area.

Historically, the VWRF has been permitted to discharge the majority of its effluent to the Santa Clara River Estuary[15]. However, during the 2008 permit re-issuance process, controversy arose on whether or not the City should be permitted to continue its current volume of discharge into the Estuary. The Discharge Permit issued by the RWQCB allowed continuation of the discharge but required the City to perform extensive studies which include:

1) Estuary Subwatershed Study (completed March 2011) – to evaluate the physical and biological function of the Estuary affected by the discharge to determine whether the discharge to the Estuary provides an ecological enhancement now or under different conditions such as a decreased discharge to the Estuary.
2) Phase 1 Recycled Water Market Study (completed March 2010) – to evaluate and quantify the feasibility of expanding the City's existing reclaimed water system through evaluation of potential users within a five-mile radius of the VWRF.
3) Treatment Wetlands Study (completed March 2010) – to evaluate the feasibility of implementing a constructed treatment wetland to further improve the water quality of the VWRF tertiary discharge by reducing nutrient and other constituent concentrations to further promote receiving water quality improvements.

[15] City of Ventura Special Studies. Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary, Ventura County CA, 2011. Page 1

4) Facilities Planning Study for Expanding Recycled Water Delivery (March 2013). The objective of Phase 2 of the Recycled Water Study was to identify and evaluate alternatives for increasing recycled water use and/or implementing constructed wetlands based on the integrated findings and conclusions of the Estuary Subwatershed Study[16].

5) Amended Estuary Special Studies Phase 2: Facilities Planning Study for Expanding Recycled Water Delivery Final Report, May 2014.

At the conclusion of the Facilities Planning Study for Expanding Recycled Water Delivery, the Regional Water Quality Control Board adopted the City's current NPDES Permit (R4-2013-0174) for the Water Reclamation Facility but with the requirement to conduct additional estuary studies. These special studies (called the Phase 3 Studies) required by the permit are to determine: (a) how much (if any) effluent discharge is needed to sustain Santa Clara River Estuary native species; (b) to identify the cause of nutrient, dissolved oxygen and toxicity impairments in the Santa Clara River Estuary; and (c) document the interaction between discharge and groundwater to determine if the beneficial uses of Municipal' applies to the water impacted by the discharge. These studies began in January 2015.

Table 4-1 shows the various agencies that have participated in recycled water planning for the City's service area and their role.

TABLE 4-1
PARTICIPATING AGENCIES

Participating Agencies	Role in Plan Development
United Water Conservation District	Stakeholder
LA Regional Water Quality Control Board	Regulator/Stakeholder
City of Oxnard	Stakeholder
Ojai Valley Sanitary District	Stakeholder
National Marine Fisheries	Regulator/Stakeholder
CA Department of Fish & Game	Regulator/Stakeholder
CA State Parks	Stakeholder
US Fish & Wildlife Service	Regulator/Stakeholder
US Army Corps of Engineers	Regulator/Stakeholder

4.1.1 Wastewater Collection and Treatment

The VWRF is permitted at 14 million gallons per day (MGD) and discharges up to 9 MGD. The VWRF currently discharges an average of 7.3 MGD with drought conditions. The VWRF provides wastewater collection and treatment service for approximately 98 percent of City residences as well as McGrath State Beach Park and the North Coast Communities (County Service Area No 29). In February 2016 the City took over sewer service for the formerly unincorporated Montalvo community served by Montalvo Community Services District. The VWRF produces recycled water that is treated to tertiary Title 22 standards through tertiary

[16] City of Ventura Recycled Water Market Study Phase 1 Report, 2010. Page 60.

filtration and disinfection. Currently, approximately 7 percent of the treated effluent is reused as recycled water; the rest is discharged to the Santa Clara River Estuary.

The City's wastewater collection system consists of approximately 290 miles of gravity sewers ranging in size from 4 to 42 inches, approximately 10 miles of force mains, 11 wastewater lift stations, and the Ventura Water Reclamation Facility, a tertiary treatment plant. In addition the City has taken over the 7.5 miles of sewer mains formerly owned by the Montalvo Community Services District. The collection system conveys flows generally from east to west and north to south, culminating at the Ventura Water Reclamation Facility for treatment.

The City first provided a municipal sewer system more than a century ago. In 1888, this system extended from Crimea Street west to the Ventura River and from the Pacific Ocean north to Ramona Street. The City later built and operated a primary treatment facility that included an ocean outfall at the foot of Figueroa Street between 1929 and 1972. At that time the outfall was abandoned and the treatment plant replaced with a pump station, which delivered all wastewater flow from the western portion of Ventura through a 3-mile force main to the VWRF. The VWRF, at 1400 Spinnaker Drive, was constructed in 1958 as a 4 MGD secondary treatment facility utilizing trickling filters. The facility is located on the north bank of and discharges treated effluent to the Santa Clara River Estuary (Estuary). The facility has provided reclaimed water since the 1960's to the City owned Olivas Park Municipal Golf Course approximately one-quarter mile east of the treatment plant. In 1972 the facility was expanded with the addition of a 10 MGD Activated Sludge treatment process. At that time tertiary filters were also constructed to provide filtered effluent for both reclamation and discharge to the Santa Clara River Estuary. Subsequent facility construction projects have added solids treatment, improved chloramine contact and expanded reclamation pumping and distribution facilities.

Table 4-2 documents wastewater collection in 2015; Table 4-3 documents wastewater treatment and discharge in 2015.

TABLE 4-2
WASTEWATER COLLECTED WITHIN SERVICE AREA 2015 (MG)

Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Ventura	Metered	3,029	City of Ventura	Ventura Water Reclamation Facility	Yes	No

Note: Currently, approximately 7% of the treated effluent is reused as recycled water, the remaining is discharged to the Santa Clara River Estuary.

TABLE 4-3
WASTEWATER TREATED AND DISCHARGED WITHIN SERVICE AREA 2015

Wastewater Treatment Plant Name	Discharge Location/ Method of Disposal	Does the Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level
Ventura Water Reclamation Facility	Discharge to Santa Clara River Estuary	Yes [a]	Tertiary

Wastewater Treated (MG)	Discharged Treated Wastewater (MG)	Recycled Within Service Area (AF)	Recycled Outside of Service Area (AF)
3,029	2,376	606	0

Notes:
a City provides sewer service to small portion of unincorporated Ventura County referred to as the "North Coast Communities" (County Service Area No. 29) and McGrath State Beach Park.

4.1.1.1 Current Recycled Water Uses

Recycled water from the VWRF is used for general irrigation of golf courses, parks and similar landscape areas. Existing recycled water uses include:

- Golf courses - Olivas Links Golf Course and Buenaventura Golf Course irrigation
- Parks - Marina Park irrigation
- Others - Landscape irrigation near Olivas Drive and in the Harbor area.

The two golf course customers, Olivas Links Golf Course and the Buenaventura Golf Course, account for between 78 percent and 91 percent of the total recycled water. In addition, discharge to the Estuary is also considered a beneficial use of the recycled water. Table 4-4 provides a summary of existing actual recycled water uses compared to the projected values in the 2010 UWMP.

In 2016 (during the preparation of this UWMP), in response to the ongoing drought, the City increased its efforts to replace potable demand with recycled water demand. The City is in the process of implementing a program whereby commercial and industrial entities and City residents can use a recycled water filling station at the VWRF. Based on multiple requests, Ventura Water expects entities such as AERA Energy, the Ventura County Transportation Department, Ventura City Parks Department, and the San Buenaventura State Park to self-haul recycled water for irrigation and dust control. The project is still in the implementation stages, but it is expected that use of the recycled water filling station could increase recycled water demand by 1.25 MGD, or about 700 AFY.

TABLE 4-4
2010 UWMP RECYCLED WATER USE PROJECTION
COMPARED TO 2015 ACTUAL (AF)

Beneficial Use Type	2010 Projection for 2015 (AF)	Actual 2015 Use (AF)
Agriculture	0	0
Landscape Irrigation	700	606
Commercial Use	0	0
Industrial Use	0	0
Geothermal/Energy	0	0
Seawater Intrusion Barrier	0	0
Recreational Impoundment	0	0
Wetlands or Wildlife Habitat	0	0
Groundwater Recharge	0	0
Surface Water Augmentation	0	0
Direct Potable Reuse	0	0
Other	0	0
Total	**700**	**606**

4.1.2 Potential and Projected Use

Recycled water could be put to beneficial use via delivery to recycled water customers or through indirect or direct potable reuse. The Phase 2 Studies formed the basis for determining how the discharge should be managed with respect to the volume and quality of discharge to the Estuary. Consequently, the outcome of the Phase 3 Studies will determine the specific volume of recycled water available for future use. The recommended project includes indirect potable reuse (IPR) or direct potable reuse (DPR) and treatment wetlands.

Ventura Water recently completed testing of technologies to treat wastewater effluent from the VWRF to purity levels far above that needed to produce drinking water. In a settlement agreement entered into by the City of Ventura and the Wishtoyo Foundation's Ventura Coast Keeper (VCK) and Heal the Bay, the City is required to determine, through scientific analysis the appropriate discharge reduction and diversion volumes or the maximum ecologically protective diversion volume (MEPDV). The timeline for determination of discharge of treated wastewater to the Santa Clara River Estuary is by January 1, 2018 and the remaining discharge would be utilized in an alternative by December 31, 2025. Reuse has a range of 2,381 AFY to 3,898 AFY depending on the MEPDV and the availability of more treated wastewater in connection with population growth over time. Estimated volumes account for water quality, capacity, and operations. Therefore, it is estimated that potable reuse would result in 3,898 AFY additional water supply.

The City recognizes the determination of MEPDV will occur in the future. However, to meet funding agency requirements, which mandate inclusion of a recommended recycled water project and associated cost estimates, the City has estimated the capacity of a future recycled water project. The capacity for the recommended project is based on the findings of the Final

Report (i.e., 4 to 5 MGD of VWRF effluent should be discharged, via a treatment wetlands, to the Santa Clara River Estuary in the critical summer period, June through September), while recognizing that future determination of the MEPDV may require the project capacity to be changed. The capacity of the recommended alternative is 3.6 MGD of IPR or DPR, which provides for continued VWRF discharge during the critical summer period that ranges between 2 MGD and 5 MGD as was identified in the Final Report. Therefore, the recommended project capacity of 3.6 MGD is a reasonable capacity increment. The recommended project includes construction of additional treatment wetlands for the remaining discharge to the Santa Clara River Estuary. The City anticipates, however, that depending on the MEPDV determination, the 3.6 MGD IRP/DRP recommended project may be modified in the future to a greater capacity, or it may be combined with other projects to achieve a greater MEPDV that allows less continued discharge to the Santa Clara River Estuary.

Table 4-5 below, from the Final Report, includes a summary of alternatives.

4.1.2.1 Other Methods to Expand Recycled Water Use

The City may be able to replace potable water supplied for industrial operations in the North Ventura Avenue area of the City. In 2007, the City partnered with Ojai Valley Sanitation District (OVSD) to conduct an engineering and market analysis of using OVSD recycled water. The engineering and market analysis identified a cost-effective combination of localized users that minimized the additional infrastructure necessary to supply the recycled water. These users, which are currently supplied with a combination of raw and potable water, could utilize approximately half of the current effluent discharge. Collectively, the environment, engineering and market analyses suggested that the re-use of at least a portion of the effluent is sufficiently feasible to justify further consideration, although there is concern that sensitive environmental resources in the Ventura River could be affected. The City and OVSD continue to discuss and work together to investigate the potential reuse of OVSD effluent, however this option is not part of the UWMP.

4.1.2.2 Projected Recycled Water Demand

The City has prepared a number of studies to determine the potential for maximizing the use of recycled water within its service area (described in section 4.1). While the studies indicate that Ventura Water will be able to expand its recycled water use, until the Phase 3 studies are completed its unclear exactly how much additional recycled water will be available.

As described in sections 3.7 and 4.1.1.1 the City is going forward with a recycled water self-hauling station and is undertaking actions to allow potable reuse of recycled water. The self-hauling station project is expected to increase recycled water demand starting in 2016. Potable reuse of recycled water is not anticipated to occur before 2018, but would provide an additional demand/supply of between 2,381 and 3,898 AFY by the end of year 2025. Table 4-6 shows the projected recycled water uses.

TABLE 4-5
PHASE 2 RECYCLED WATER STUDY ALTERNATIVES

Alternative	Effluent Diversion Capacity (AFY) [a]	Water Supply Flow (AFY)	Treatment Process	Cost Components					CEQA Permitting ($M)	W/ Wetlands		W/O Wetlands	
				Wastewater Treatment	Brine Disposal [b]	Conveyance/ Storage/ Injection	Recycled Water Distribution System	Wetlands		Total Project Cost ($M)	O&M Cost ($M/Yr)	Total Project Cost ($M)	O&M Cost ($M/Yr)
North decentralized plant – irrigation	2,240	270	Membrane Bioreactor Plant	21			3.5	6.8	1.5	33	0.90	26	0.70
Conveyance to Oxnard [c]	14,560	None	Disinfection improvements	5		41		6.8	2.0	54	16.210	48	16.00
Conveyance to Oxnard [d]	14,560	None	Advance Water Purification Facility Expansion and disinfection improvements	45		41		6.8	2.0	95	5.20	88	5.00
Full flow recharge/ag supply for United Water Conservation District	14,560	Possible [e]	Microfiltration/Ultra filtration and reverse osmosis (MF/UF, RO)	41	22	27		6.8	2.5	100	5.60	93	5.50
Partial flow recharge/ ag supply for United Water Conservation District	8,960	Possible [e]	MR/UF, RO	16	22	27		6.8	2.5	74	2.10	67	2.00
Mound Basin IRP (3.6 MGD)	5,040	4,030	MF/UF, RO, and advanced oxidation	32	22	30		6.8	2.5	94	3.2	87	3.00
Mound Basin IRP (6.3 MGD)	8,870	7,100	MF/UF, RO, and advanced oxidation	52	22	39		6.8	2.5	122	5.3	115	5.10
North decentralized plant - DPR	2,520	2,020	MF/UF, RO, and advanced oxidation	38		4		6.8	3.0	52	2.10	45	1.00
DPR (3.6 MGD)	5,040	4,030	MF/UF, RO, and advanced oxidation	32	22	16		6.8	3.0	80	3.00	74	2.90

Source: Table ES.3 from the Amended Estuary Special Studies Phase 2: Facilities Planning Study for Expanding Recycled Water Delivery Final Report, May 2014 by Carollo Engineers for the City of Ventura, Ventura Water.

a Projected ultimate wastewater flows from the VWRF are as high as 13 MGD or approximately 14,560 AFY

b For alternatives with brine treatment, the cost of disposal at the SMP is included.

c City of Oxnard pays for the Advanced Water Purification Facility expansion. Treatment and conveyance capital costs, and O&M costs are from Kennedy/Jenks (2013).

d City of Oxnard pays for the Advanced Water Purification Facility expansion. Treatment and conveyance capital costs are from Kennedy/Jenks (2013), O&M costs estimated as part of Phase 2 Recycled Water Study.

e Potential water supply flow undefined at this point as it would be based on negotiations with the Fox Canyon GMA.

TABLE 4-6
PROJECTED RECYCLED WATER USES

Beneficial Use Type	2020	2025	2030	2035	2040
Agriculture	0	0	0	0	0
Landscape Irrigation [a]	700	842	865	889	914
Commercial Use	0	0	0	0	0
Industrial Use	0	0	0	0	0
Geothermal/Energy	0	0	0	0	0
Seawater Intrusion Barrier	0	0	0	0	0
Recreational Impoundment	0	0	0	0	0
Wetlands or Wildlife Habitat	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0
Surface Water Augmentation	0	0	0	0	0
Direct Potable Reuse[b]	0	2,381	2,670	3,898	3,898
Other	0	0	0	0	0
Total	**700**	**3,223**	**3,535**	**4,787**	**4,812**

Notes:
a See Table 2-6
b 3,898 AFY equals 3.5 MGD daily average. Maximum plant capacity would be 3.6 MGD.

4.1.3 Methods to Encourage Recycled Water Use

In 1990 the City Council adopted a policy on reclaimed water use mandating that all new commercial development located near existing reclaimed water distribution systems must install a dual water system to allow the use of reclaimed water for landscape irrigation. To date three projects have or are anticipated to utilize recycled water for irrigation under this policy. Drought restrictions imposed in September 2015 and the addition of the drought surcharge to customer bills has made recycled water an attractive alternative supply.

Section 5: Water Quality

The quality of any natural water is dynamic in nature. This is true for surface water and local groundwater. During periods of intense rainfall or snowmelt, routes of surface water movement are changed; new constituents are mobilized and enter the water while other constituents are diluted or eliminated. The quality of water changes over the course of a year. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall and snowmelt. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

The City's water sources are within current and anticipated Environmental Protection Agency (EPA) and State Water Resources Control Board Division of Drinking Water (DDW) levels for primary water quality standards. Based on current conditions and knowledge, water quality is not anticipated to affect water supply reliability. However, water quality issues are constantly evolving. It is well recognized water quality treatment can have significant costs.

The City's east side receives its water from groundwater wells and has significantly higher levels of total dissolved solids (TDS) and minerals (hardness) compared to the water delivered to Ventura's west end. As such, TDS levels in excess of 1,000 parts per million (PPM) are experienced on a daily basis in the eastern portions of the system. In order to meet secondary water quality standards, the DDW requires the City to limit TDS levels to 1,000 PPM and implement further reductions as new water supplies are added to the system. At this time, groundwater from multiple wells in both the Mound and Oxnard Plain basins are treated and blended at the Bailey Treatment Plant to achieve the lowest TDS levels possible without sacrificing supplies. Groundwater in the Mound Basin is high in TDS and sulfate. Some portions of the groundwater exceed the sulfate maximum contaminant level (MCL) of 500 ppm, with conditions between 445 and 669 PPM. To satisfy the TDS water quality goals established by the City Council in the Comprehensive Water Resources Management Plan Update, additional Westside water supplies or treatment of eastside sources will be required (Consumer Confidence Report 2015). The initial target is to lower TDS levels in the eastern portion of the system to 900 ppm by 2025 with possible further reductions to levels as low as 500 ppm TDS in the future.

The City continues to monitor for regulated as well as unregulated contaminants, in the event that they are added to the contaminants list in future drinking water standards. Recently, a Groundwater Treatment Study was completed that evaluated options for water quality treatment. In addition, a water quality improvement program is being developed to mitigate any potential water quality issues. The program would combine many of the City's current actions (blending, nitrification plan, etc.) into one coordinated plan that will include blending with new sources and/or direct treatment of groundwater to include technology such as reverse osmosis. The program would also identify the specific actions and projects that should be implemented within the distribution system, at the well, tank and booster station sites, and at the treatment plants.

Section 6: Reliability Planning

6.1 Overview

The Act requires urban water suppliers to assess water supply reliability that compares total projected water use with the expected water supply over the planning period in five year increments. The Act also requires an assessment for a single dry year and multiple dry years. This chapter presents the reliability assessment for the Ventura Water service area.

6.2 Normal Water Year

The Normal/Average year is a year in the historical sequence that most closely represents median runoff levels and patterns. This section summarizes Ventura Water supplies available to meet demands over the 25-year planning period during an average/normal year and compares them to demands for the same period. Assumptions about supplies and demands are provided in Chapters 2 and 3. Table 6-1 demonstrates that with planned supplies (see section 3.7) the City anticipates adequate supplies for years 2020 to 2040 under Normal conditions.

TABLE 6-1
COMPARISON OF SUPPLIES AND DEMANDS IN AVERAGE/NORMAL YEAR (AF)

	2020	2025	2030	2035	2040
Supplies					
Casitas Municipal Water District [a]	5,741	5,901	6,065	6,233	6,407
Ventura River [b]	4,200	4,200	4,200	4,200	4,200
Groundwater [c]	11,106	11,106	11,106	11,106	11,106
Recycled Water [d]	700	700	700	700	700
Planned Additional Recycled Water [e]	0	142	165	189	214
Planned Potable Reuse [f]	0	2,381	2,670	3,898	3,898
Planned Ocean Desalination [f]	0	0	0	1,500	1,500
Total Supplies [g]	**21,747**	**24,430**	**24,906**	**27,826**	**28,025**
Estimated Demands (Table 2-6)	**20,245**	**20,930**	**21,512**	**22,111**	**22,724**
Difference (Supply - Demand)	***1,502***	***3,500***	***3,394***	***5,715***	***5,301***
Difference as % of Demand	***7%***	***17%***	***16%***	***26%***	***23%***

Notes:

a See Table 3-1

b See Table 3-2

c See Table 3-4

d See Section 4.1

e See Table 3-5

f See Section 3.7

g Maximum supplies do not account for potential reductions to meet water quality objectives.

During the Water Commission Meeting on October 27, 2015 the Water Commission determined that it was appropriate to use a supply surplus buffer of 20% for normal hydrological years. The buffer is used for the purpose of determining water supply needs and capital cost estimates for building or attaining new supply sources that will meet the surplus buffer. Table 6-1 demonstrates that, per Water Commission policy, City water supplies are inadequate.

6.2.1 Single-Dry Year

The water supplies and demands for the Ventura Water service area over the 25-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977. Table 6-2 summarizes the existing and planned supplies available to meet demands during a single-dry year.

TABLE 6-2
COMPARISON OF SUPPLIES AND DEMANDS IN SINGLE-DRY YEAR (AF)

	2020	2025	2030	2035	2040
Supplies					
Casitas Municipal Water District [a]	5,741	5,901	6,065	6,233	6,407
Ventura River [b]	4,200	4,200	4,200	4,200	4,200
Groundwater [c]	10,868	10,868	10,868	10,868	10,868
Recycled Water [d]	700	700	700	700	700
Planned Additional Recycled Water [e]	0	142	165	189	214
Planned Potable Reuse [f]	0	2,381	2,670	3,898	3,898
Planned Ocean Desalination [f]	0	0	0	1,500	1,500
Total Supplies [g]	**21,509**	**24,192**	**24,668**	**27,588**	**27,787**
Estimated Demands (Table 2-7)	**20,245**	**20,930**	**21,512**	**22,111**	**22,724**
Difference (Supply - Demand)	**1,264**	**3,262**	**3,156**	**5,477**	**5,063**
Difference as % of Demand	***6%***	***16%***	***15%***	***25%***	***22%***

Notes:
a See Table 3-1
b See Table 3-2
c See Table 3-4
d See Section 4.1
e See Table 3-5
f See Section 3.7
g Maximum supplies do not account for potential reductions to meet water quality objectives.

6.2.2 Multiple-Dry Year

The water supplies and demands for Ventura Water's service area over the 25-year planning period were analyzed in the event that a four-year multiple-dry year event occurs, similar to the drought that occurred during the years 1931 to 1934. Table 6-3 summarizes the existing and planned supplies available to meet demands during multiple-dry years. Table 6-3 documents

that in the near term (2020 to 2030) until such time as planned supplies come on-line, supplies in a multiple-dry year are insufficient. After planned supplies are available the potential for shortage is lessened. It is assumed that if the current drought continues and the City does experience multiple dry years the City's customers will need to continue and/or increase their water conservation and/or pay penalties for overuse of the City's water supply sources.

TABLE 6-3
COMPARISON OF SUPPLIES AND DEMANDS IN MULTIPLE-DRY YEARS (AF)

	2020	2025	2030	2035	2040
Supplies					
Casitas Municipal Water District [a]	4,593	4,720	4,852	4,987	5,125
Ventura River [b]	1,298	1,298	1,298	1,298	1,298
Groundwater [c]	11,009	11,009	11,009	11,009	11,009
Recycled Water [d]	700	700	700	700	700
Planned Additional Recycled Water [e]	0	142	165	189	214
Planned Potable Reuse [f]	0	2,381	2,670	3,898	3,898
Planned Ocean Desalination [f]	0	0	0	1,500	1,500
Total Supplies [g]	**17,600**	**20,250**	**20,694**	**23,581**	**23,744**
Estimated Demands (Table 2-7)	**20,245**	**20,930**	**21,512**	**22,111**	**22,724**
Difference (Supply - Demand)	**(2,645)**	**(680)**	**(818)**	**1,470**	**1,020**
Difference as % of Demand	***-13%***	***-3%***	***-4%***	***7%***	***4%***

Notes:

a See Table 3-1

b See Table 3-2

c See Table 3-4

d See Section 4.1

e See Table 3-5

f See Section 3.7

g Maximum supplies do not account for potential reductions to meet water quality objectives.

6.2.3 Summary of Comparisons

As shown in the analyses above, with planned supplies, Ventura Water has adequate supplies to meet demands during average and single-dry year. However there is a potential shortage in the near-term during a multiple-dry year period.

Section 7: Demand Management Measures

7.1 Demand Management

The purpose of the Demand Management Measures (DMM) section of this UWMP is to (a) provide a description of the past water conservation programs that Ventura Water has implemented since 2010 to meet its urban water use reduction targets and (b) describe the activities and actions Ventura Water plans to use in the future to meet its urban water use reduction targets. For the purposes of this UWMP the DMMs are categorized as "Foundational" and "Other". Foundational DMMs, listed below, are those DMMs that the UWMP Act and Water Code specifically mention:

a. Water waste prevention ordinances
b. Metering
c. Conservation pricing
d. Public education and outreach
e. Programs to assess and manage distribution system real loss
f. Water conservation program coordination and staffing support

Activities outside of the Foundational DMMs that encourage less water use in the City service area fall in the "Other DMM" category.

This chapter discusses the DMMs that Ventura Water undertakes as part of normal business. However, given the extraordinary and continuing drought, this chapter also describes those measures that were undertaken specifically to address dry conditions.

7.1.1 Foundational DMMs

7.1.1.1 Water Waste Prohibition

Ventura Water prohibits water waste through its Water Conservation Ordinance (Division 22 – Public Utilities, Chapter 22.170). Specifically Section 22.170.010 states:

"Water waste prohibited.

A. Prohibited uses. No person shall use or permit the use of water:
    1. For the watering of turf, ornamental landscape, open ground crops and trees, including agricultural irrigation, in a manner or to an extent which allows water to run to waste;
    2. Such that the escape of water through leaks, breaks or malfunction within the water user's plumbing or distribution system occurs for any period of time beyond which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of 48 hours after the water user

discovers such leak, break or malfunction, or receives notice from the city of such condition, whichever occurs first, is a reasonable time within which to correct such condition;

3. In conjunction with use of a handheld hose to wash automobiles, trucks, trailers, boats, or other types of mobile equipment without the use of a workable positive shutoff nozzle;
4. For the operation of any ornamental fountain, or similar structures, unless water for such use is recycled for lawful reuse without substantial loss;
5. For washing of sidewalks, walkways, driveways, parking lots or any other hard-surfaced areas by hose or flooding, except as otherwise necessary to prevent or eliminate conditions dangerous to the public health and safety or for other legitimate necessity;
6. For serving of water by a restaurant to its customers without first being requested by the customer; or
7. Knowingly for any indiscriminate running of water or washing with water not otherwise prohibited above which is wasteful and without reasonable purpose."

7.1.1.2 Metering

All of the City's existing retail customers are metered and billed and all new connections are metered.

7.1.1.3 Conservation Pricing

All of the City's retail customers are metered and billed with commodity rates for both water and sewer service. The City does not have any unmetered services and all new connections are metered and billed volumetrically.

Efforts in 2015

In response to worsening drought conditions, the City Council adopted Water Shortage Rates on June 8, 2015 that were developed and refined by a 13 member task force. The water shortage rates have assisted the City in achieving additional conservation.

7.1.1.4 Public Education and Outreach

Ventura Water has consistently and actively encouraged water conservation through an extensive public education and outreach campaign. Outreach has utilized multiple venues including social media, printed media (bill inserts, handouts), outdoor advertising (billboards), radio, television, hosting of water conservation workshops, participation in community events (parades and street fairs). These outreach activities are summarized in Table 7-1.

Efforts in 2015

Due to the continuing and extraordinary drought conditions, in 2015 Ventura Water intensified its public outreach and messaging. The Ventura Water website pages were enhanced to further engage the complexity of the drought and provide accurate and up to date information on topics such as water efficiency, water quality, local, regional, and state wide water shortage information, an online water waste reporting portal was added, and a portal where customers could make an appointment for a free water conservation survey was added.

TABLE 7-1
VENTURA WATER OUTREACH PROGRAMS

Action	Description	2011	2012	2013	2014	2015
Monthly E-Newsletter	E-Letter providing information on supplies/capital improvement projects, conservation tips, advertisement of rebate programs, advertisement of conservation classes and special events	X	X	X	X	X
Website	Central information portal including FAQs, notices, water quality data, water conservation information, public meeting information, and helpful tips	X	X	X	X	X
Outreach Events	12-30 public outreach events per year, consisting of job fairs, City sponsored events, Chamber of Commerce events, with giveaways and informational handouts	X	X	X	X	X
Social Media	Active and up to date presence on Facebook, Twitter, Wordpress, YouTube. Ventura Water Blog with active links and postings promoting Ventura Water website.	X	X	X	X	X
Public Engagement Materials	Water quality Consumer Confidence Report. Brochures “Protecting our Pipes”; “Understanding Water and Wastewater Charges”; “Customer Assistance Program”; “Water Disaster Preparedness”; and “Fats, Oils, and Grease”.	X	X	X	X	X
Targeted Outreach	Contact and outreach to top 100 commercial water users.					X
Additional Targeted Outreach	Phone calls, letters, postcards, door hangers.	X	X	X	X	X
Water Customer Touch Points	Yard signs “Doing Our Part to Save Water” Summer radio campaigns Low flow showerheads Low flow faucet aerators Toilet leak detection kits Shower pause valves Shower timers Reusable water bottles Dish squeegees Sustainability kits		X	X	X	X

Table 7-1 cont.

Action	Description	2011	2012	2013	2014	2015
Individualized Letters to All Customers	Letters to each customer communicating specific restrictions and allocations applicable to their account.	X	X	X	X	X
Townhall Meetings/ Public Informational Meetings	Ventura Water plans, attends, and hosts public meetings to share water shortage rates information, ordinance changes, and customer programs to provide an opportunity for residents to voice concerns	X	X	X	X	X
Customer Water Waste Hotline	Hotline where customers can report water waste.				X	X
Water Take 1	A home grown international short film contest that brings awareness to the value of water.		X	X	X	X

In the summer of 2015, Ventura Water launched its summer campaign of "Hey Ventura What's Your Shower Song" to bring awareness to the community of saving water by taking shorter showers. Ventura Water partnered with Cumulus radio locally where daily KHAY and 103.3 theVibe broadcast the morning shower song and encouraged residents to shower to the length of their favorite song. Over 750,000 listener impressions were documented from June 18 to August 30th (gross impressions = the average number of persons listening to a particular station for at least 5 minutes during a 15 minute period).

From February through November of 2015, the Ventura Water Outreach team, an assembly of Ventura Water staff who represent the laboratory, the wastewater collections system, the wastewater plant operations, water distribution, and the General Managers office attended multiple events to perform face to face public engagement related to drought messaging (see Table 7-2).

7.1.1.5 Programs to Assess and Manage Distribution System Real Loss

The City guards against water loss by maintaining and replacing their meters and pipelines. City practice is to try to replace all meters every 15 years. Large meters are tested and calibrated annually. Additionally, Ventura Water operates a leak detection program for pipelines and continually replaces older pipelines as part of its capital improvement program.

Ventura Water utilized the Water Audit Methodology (Appendix L of the Guidebook) to estimate both real and apparent water loss. The 12 month period used in the analysis was January to December 2015. The City estimates that meter inaccuracies account for about one percent of the unaccounted water; real-losses are estimated to be about 9 percent of production. The Water Loss Audit Report is provided in Appendix E.

Consistent with Senate Bill 555, Ventura Water will conduct a water loss audit each year and report water loss to DWR annually starting in October 2017.

7.1.1.6 Water Conservation Program Coordination and Staffing Support

The conservation program is managed by Ventura Water's Management Analyst, who oversees water resources management for the City. Program activities are managed by various City staff as part of their regular assignment, which equates to one full time employee.

TABLE 7-2
DROUGHT SPECIFIC OUTREACH PROGRAMS

3/7/2015	Water Wise Garden Class
3/12/2015	Wild and Scenic Film Festival
3/13/2015	Wild and Scenic Film Festival
3/19/2015	Water Take 1 Event
3/20/2015	Home and Garden Show (Fri)
3/21/2015	Home and Garden Show (Sat)
3/22/2015	Home and Garden Show (Sun)
4/11/2015	Water Wise Garden Class: Compost Workshop Green Thumb
4/22/2015	Ventura College Earth Day
4/25/2015	Earth Day Ecofest
5/2/15	Water Wise Garden Class: Graywater/Rainwater
5/28/2015	Chamber of Commerce Spring Business EXPO
5/30/2015	Ventura Unified School District SummerFest
6/6/2015	Water Wise Garden Class: Controllers and Irrigation Efficiency
6/13/2015	Surf N Suds Festival
7/4/2015	July 4th Street Fair
8/29/2015	Golden Lawn Expo
9/12/2015	Water Wise Garden Class
9/24/2015	Chamber of Commerce Fall Business EXPO
10/10/15	Ventura Unified School District StoryFest
10/11/15	Das Williams: Disaster Preparedness Fair
10/22/15	Environmental Science and Resource Management Career Day (CSU Channel Islands)
10/28/15	13th Annual Employee Health and Wellness Fair

7.1.2 Other DMMs

7.1.2.1 Wholesale Agency Assistance Programs

Ventura Water will continue to work cooperatively with Casitas Municipal Water District to participate in regional DMM programs, informational groups and projects, determination of the most cost-effective DMMs, and tailoring programs specific to the City. Ventura Water customers that are within the Casitas service area qualify for many conservation incentives,

including water audits, free low flow showerheads and aerators, and rebates for high efficiency toilets and washing machines. These conservation opportunities are described at Casitas' website (www.casitaswater.org). Water conservation activities undertaken by Casitas in the Ventura Water area are summarized in Table 7-3.

An example of coordination between Ventura Water and Casitas is the Water Wise Incentive Program. The Water Wise Incentive Program is a new regional water conservation program that will provide outdoor water use efficiency incentives to customers of Ventura Water, the City of Santa Paula and Casitas Municipal Water District. Starting in 2016, the Water Wise Incentive Program will offer rebates for turf removal, weather-based irrigation controllers, high-efficiency nozzles, and rainwater harvesting and reuse. The City, Casitas, and the City of Santa Paula cooperatively designed the program and successfully pursued grant funding for the project.

TABLE 7-3
VENTURA WATER PARTICIPATION IN WHOLESALE AGENCY PROGRAMS

Description	2011	2012	2013	2014	2015
Residential Water Surveys	1	4	3	12	1
Commercial Water Surveys			1		
Residential High Efficiency Toilets	4		5	81	8
High Efficiency Washing Machine Rebates	3		2	18	3
Free Low-Flow Showerheads	348	379	596	422	
Free Kitchen and Bathroom Aerators	348	379	596	422	

7.1.2.2 Ventura Water Partnerships with Ventura Unified School District

Since 2009, the City of Ventura Water Department and Environmental Sustainability Division have provided environmental educational programming to Ventura Unified School District in the form of classroom presentations, assemblies, special event participation, special projects and equipment (i.e. recycle bins, composting bins, gardening supplies). Over 20,000 students have received education on water conservation, stormwater pollution prevention and waste reduction.

In 2013, Ventura Water provided financial support and technical staff support to Will Rogers Elementary School on the installation of a National Fish and Wildlife Schoolyard Habitat and Ocean Friendly Garden bioswale.

In 2014 Ventura Water provided financial support and technical staff support to Loma Vista Elementary School on the installation of a California Native and Ocean Friendly Garden and bioswale.

Students receive grade-specific lessons on water conservation. In kindergarten, children learn about the water cycle and use interactive felt "water cycles" in a hands-on activity as well as sign a song about the water cycle. In second grade students learn about watersheds, the built and natural water systems (i.e. watersheds and stormwater and water utility systems) and play an interactive bingo game that build vocabulary. And in fifth grade students are given a comprehensive overview of California's water system in comparison to our local system and participate in a gameshow to reinforce new terms and concepts.

In addition to the annual educational presentations, other activities have included field trips to the reclamation and drinking water treatment plants, presentations using the "Enviroscape" model and other customized presentations on water conservation, watershed protection and drought. Table 7-4 summarizes the school outreach metrics.

TABLE 7-4
SCHOOL OUTREACH METRICS

	2011	2012	2013	2014	2015
# of students	3,517	4,957	4,101	2,704	2,534
# of presentations	112	181	87	286	263

7.1.2.3 Efforts In 2015

WaterWise Financial Incentive Program

The City of Ventura launched its first WaterWise turf replacement program in July 2015. As of December 2015 all funds were earmarked for potential projects with an estimated total amount of turf removed projected to be approximately 357,000 square feet with an estimated annual water savings of up to 50 acre-feet per year utilizing a formula that assumes a landscape with low water use plants.

The newly implemented Water Wise 2.0 Incentive Program is targeting a launch date inSummer, 2016. The Water Wise Incentive Program, will be a regional water conservation program that provides outdoor water use efficiency incentives to customers of Ventura Water, City of Santa Paula and Casitas Municipal Water District (CMWD). The program will offer rebates for turf removal, efficient irrigation devices and rain barrels. Ventura Water will be the lead agency administering the regional program.

Free In-Home Water Conservation Surveys

Ventura Water offers residents a free water conservation survey. Residents can make an appointment to have a conservation specialist come and evaluate indoor and outdoor water usage, including leak detection. Depending on the results of the survey the City will provide low flow showerheads, aerators and information as appropriate. In 2015, 342 Water Conservation surveys were completed.

Enforcement of Water Waste Prohibition

As part of the ongoing drought, Ventura Water created a website link where residents could anonymously report water waste. City staff investigated several hundred incidents, sent 597 water waste education letters, issued 58 notices of violation, and issued 31 fines.

7.2 Planned DMMs to Meet Water Use Targets

Ventura Water customers have already achieved demand reductions sufficient to meet SBX7-7 water use targets. Ventura Water will continue to perform Foundational DMMs. These DMMs, expanding opportunities for new recycled water use customers in the service area, as well as potable reuse, will help the City to keep its GPCD within or lower than the SBX7-7 water use targets.

Section 8: Water Shortage Event Contingency Planning

8.1 Overview

This chapter documents the City's Water Shortage Event Contingency Plan and Emergency Response Plan per requirements of Section 10632 of the California Water Code.

The purpose of the Water Shortage Event Contingency Plan is to provide a plan of action to be followed during the various stages of a water shortage. The plan includes the following elements: action stages, estimate of minimum supply available, actions to be implemented during a catastrophic interruption of water supplies, prohibitions, penalties and consumption reduction methods, revenue impacts of reduced sales, and water use monitoring procedures.

8.2 Resolution or Ordinance

Much of the material presented in this chapter is derived from the material of the City of Ventura's Water Shortage Event Contingency Plan, approved by the City Council and released in March 2015 (Appendix K). All other relevant material can be found in the City's Municipal Code, Chapter 22.170 Water Conservation and Chapter 22.171 Water Shortage Regulations and Rates Relating Thereto.

8.3 Stages of Action to Respond to Water Shortages

The City has developed a six-stage water shortage plan to reduce demands up to 50 percent of normal supply during a severe or extended water shortage. The plan includes voluntary and mandatory stages which are intended to be fair to all water customers with the minimum impact on business, employment and quality of life. Water shortage triggering levels are established to ensure that the policy statements are implemented. Two types of triggers are discussed below: 1) Triggers that would elicit a short term water supply response (i.e., voluntary or mandatory water conservation program, emergency water connections, etc.) and 2) Triggers that would trigger a long-term water supply response (i.e., seawater desalination facility, imported water, etc.). The water shortage stages and the reduction goals for each stage are outlined in Table 8-1.

TABLE 8-1
RATIONING AND REDUCTION GOALS

Deficiency	Stage	Demand Reduction Goal	Type of Program
Up to 10%	Stage 1	10% Reduction	Voluntary
10-19%	Stage 2	10% Reduction	Mandatory
20-29%	Stage 3	20% Reduction	Mandatory
30-39%	Stage 4	30% Reduction	Mandatory
40-49%+	Stage 5	40% Reduction	Mandatory
Greater Than 50%	Stage 6	50+% Reduction	Mandatory

The long term water supply response triggers include the following:

Response to reduced water supply – Any water shortage event should trigger a review of potential sources for supplement water supply. A supplement water supply project should be a priority for consideration in immediate capital projects if the five year supply projection shows a reduction of ten percent or more in water supply from all the sources combined, or if a Stage 3 Water Shortage Event continues for more than 18 months. Additional supply sources for consideration by the City Council include seawater desalination, purchasing and importing state water, increased use of reclaimed water, and other alternatives based on the actual circumstances at that time.

Response to increased future demand – The water demand trigger is met when projected annual demand within five years exceeds 90% of normal year supply as defined in Table 4.2 of the most current Comprehensive Water Resources Report (CWRR). This demand-based trigger should be considered independently of the triggers based on reduced supply.

8.4 Prohibitions, Penalties, and Consumption Reduction Methods

At each of the six stages of action within the Water Shortage Event Contingency Plan, the City, the Ventura Water Department and City water customers each have certain actions they must undertake. Public agency actions involve increasing public awareness and education, adopting ordinances prohibiting water waste and establishing mandatory water conservation regulations, and periodically reviewing triggering levels. Water customer actions involve implementing water conservation measures and complying with water conservation ordinances. Significant measures of the six-stage water shortage plan include:

Stage 1 & 2: 0-10 Percent Reduction Goal (Voluntary/Mandatory)

Trigger: Annual supply projection is 10% below normal year supply projection for Stage 1 and 20%-29% below normal year supply projection for Stage 2

City Actions

- Monitor conservation levels and increase public awareness.
- Notify customers of shortage conditions and disseminate water conservation information and kits.
- Publicize Water Shortage Event Contingency Plan stages and the possible actions per stage including water use reduction goals.
- Provide information on customer's bill as to what they should be using for the needed cutback.
- Maintain existing tiered rate structure to promote water conservation.
- Enforce mandatory water consumption reduction program for all customers and users.

- Enact water rate surcharge for water consumption over baseline amount. Enact surcharge review program, customers may appeal in writing for a waiver of penalties incurred due to a leak, break or hardship.

- Give incentive for landscape changes to use less irrigation.

- Promote grey water use by education, incentives and other actions.

- Enforce Water Waste Ordinance.

- Inform new development applicants of Water Shortage Event Contingency Plan and its restrictions, including notice that if conditions worsen issuance of permits and development approvals may be delayed until additional supply becomes available or conditions significantly improve.

- Provide ways to increase use of recycled water to reduce potable water usage.

Water Customer Actions

- Monitor own meter for usage.

- Implement conservation measures to reduce usage.

- Comply with City's Water Waste Ordinance.

- Where feasible, use non-potable water to perform dust control, irrigate street landscaping, parks, and other areas

Stage 3: 20 Percent Reduction Goal (Mandatory)

Trigger: Annual supply projection is between 20% and 29% below normal year supply projection

City Actions (In addition to actions established in previous Stage)

- Prepare a resolution for City Council consideration that will initiate the appropriate mandatory conservation stage addressed in the City's Water Waste Ordinance.

- Make reasonable efforts to provide low cost recycled water for irrigation and other non-potable uses as approved by regulatory agency.

- Municipal Irrigation Interruptible Rate Customers will reduce use of potable water by 20%.

- Use recycled water on City parks and landscaping using contract trucks or other equipment.

- Provide incentives to single metered multi-family units to install individual meters or sub-meters.

- Send written notification of increase to Stage 3 to all development project applicants.

- Change outdoor watering limitations to specific days of the week to aid enforcement.

Water Customer Actions (In addition to actions established in previous Stage)

- Comply with mandatory water conservation regulations.
- Do not wash sidewalks, walkways, driveways, parking lots or any other hard surfaced areas by hose or flooding, except as otherwise necessary to prevent or eliminate conditions dangerous to the public health and safety or for other legitimate necessity.
- Bath, dish washing, and laundry water may be used for outside irrigation purposes to the extent allowed under local health and safety regulations.
- No outdoor irrigation of ornamental landscape or turf with potable water through an irrigation system between the hours of 9:00 am and 6:00 pm and limiting irrigation to two days a week.
- Comply with these on other requirements of the Water Waste Ordinance:
    - Do not allow water to run and be wasted during outdoor use. (Adjust or reduce sprinklers so the water does not run onto the pavement or street.)
    - Do not allow leaks to persist past 48 hours.
    - Handheld hoses used to wash a vehicle must have an automatic shutoff nozzle.
    - Water service in all restaurants is by customer request only.
    - Do not operate fountains unless the water is recirculating.
    - Do not knowingly waste water in any way.

Stage 4: 30 Percent Reduction Goal (Mandatory)

Trigger: Annual supply projection is between 30% and 39% below normal year supply projection.

City Actions (In addition to actions established in previous Stage)

- Prepare a resolution for City Council consideration initiating the appropriate mandatory conservation stage addressed in the City's Municipal Code or the Water Shortage Event Contingency Plan.
- Ensure efficient use of potable water for street sweeping and other activities that otherwise consume potable water.
- Municipal Irrigation Interruptible Rate Customers will reduce use of potable water by 30%.
- Implement baseline/use appeal process for hardship cases.

- New development that does not have a water supply to serve their project which supplements the City's water supply will be required to offset any impact to water supply during the Stage 4 (or higher) Water Shortage Event if they wish to continue the entitlement process during a Water Shortage Event.

Water Customer Actions (In addition to actions established in previous Stage)

- Comply with mandatory water conservation guidelines.

Stage 5: 40 Percent Reduction Goal (Mandatory)

Trigger: Annual supply projection is between 40% and 49% below normal year supply projection

City Actions (In addition to actions established in previous Stage)

- Prepare a resolution for City Council consideration initiating the appropriate mandatory conservation stage addressed in the City's Municipal Code or the Water Shortage Event Contingency Plan..
- Enforce mandatory water consumption goals and allocations for all customers and users.
- Municipal Irrigation Interruptible Rate Customers will reduce use of potable water by 40%.
- Prepare a resolution for City Council consideration directing the Community Development Department to stop processing development approvals in order to conduct a public hearing regarding water allocation to development applications.
- Limit outdoor watering to 1 day per week.

Water Customer Actions (In addition to actions established in previous Stage)

- Comply with mandatory water conservation regulations.

Stage 6: 50+ Percent Reduction Goal (Mandatory)

Trigger: Annual supply projection is above 50% below normal year supply projection

City Actions (In addition to actions established in previous Stage)

- Prepare a resolution for City Council approval initiating the appropriate mandatory conservation stage addressed in the City's Municipal Code or the Water Shortage Event Contingency Plan.
- Enforce mandatory water consumption goals and allocations for all customers and users.
- No outdoor irrigation using potable water will be allowed.

- All water use not required for health and safety is prohibited.
- Suspend the issuance of any new development approvals and new water connections other than those required to be processed by state law. Building permits which do not create new demand for water or which are for emergencies, public safety and water conservation may be exempted by the City Manager.

Water Customer Actions (In addition to actions established in previous Stage)

- Comply with mandatory water conservation regulations.
- Prohibition of all outside water use unless necessary for the preservation of health and safety and the public welfare.
- Watering with hand-held five gallon maximum bucket, filled at exterior hose bib or interior faucet (not by hose) shall be allowed at any time. This will assist in preserving vegetable gardens or fruit trees.
- The filling of swimming and wading pools is prohibited.

Priorities for Water Use

The following priorities for use of available water, based on Chapter 3 of the California Water Code (Water Shortage Emergencies, Sections 350-359) and community input, were used in establishing consumption limits. In order of preference they are:

1. Health and Safety – interior residential use and firefighting
2. Commercial, Industrial and Governmental Uses – maintain jobs and economic base
3. Permanent Crops
4. Annual Crops. Exiting Landscaping – especially trees and shrubs
5. New Demand –projects without permits when shortage declared.

In addition to the prohibitions above, the City also has a Water Waste Ordinance. In April 1989, the City adopted Ordinance 89-6 prohibiting water waste. The Water Waste Ordinance was further amended through Ordinance 2015-007 by the addition of Chapter 22.171 “Water Shortage Regulations and Rates Relating Thereto” adopted June 15, 2015. Prohibited actions and penalties for violating the Water Waste Ordinance are specified in the City’s Municipal Code. Table 8-2 summarizes the penalties.

TABLE 8-2
PENALTIES AND CHARGES

Penalties or Charges	Number of Violations Within a 12 Month Period
Notice is given to the property owner	1
Surcharge penalty of 50 percent of the most recent bimonthly water bill, or $25.00, whichever is less, shall be assessed	2
Surcharge penalty of 25 percent of the most recent bimonthly water bill, or $50.00, whichever is greater, shall be assessed	3
City shall install a flow restricting device of one GPM for a period of no less than 48 hours. Subsequent violations may warrant discontinuing of service.	4+

In addition, in an effort to further incentive conservation and cover the extra operating costs during shortage, the City has also adopted the following modified Shortage Rates.

TABLE 8-3
SHORTAGE RATES INCREASE BY STAGE

Customer class	Bi-monthly Tier (FY15-16)*	Base Rate ($/HCF)[a]	Stage 2 Increase	Stage 3 Increase	Stage 4 Increase	Stage 5 Increase	Stage 6 increase
Inside City Single Family Residential							
Tier 1	6	$2.40	1.00	1.00	1.00	1.00	1.00
Tier 2	14	$2.40	1.13	1.36	1.46	1.71	2.10
Tier 3	30	$3.35	1.20	1.66	2.09	2.99	5.08
Tier 4	>30	$5.66	1.19	1.48	2.18	4.67	8.70
Multi-Family Residential (per unit)							
Tier 1	6	$2.40	1.00	1.00	1.00	1.00	1.00
Tier 2	10	$2.40	1.13	1.36	1.46	1.71	2.10
Tier 3	16	$3.35	1.20	1.66	2.09	2.99	5.08
Tier 4	>16	$5.66	1.19	1.48	2.18	4.67	8.70
Non-Residential		$3.09	1.12	1.17	1.21	1.27	1.31
Non-Residential Irrigation		$3.09	1.20	1.60	2.13	3.66	6.64
Institutional/ Interruptible		$2.39	1.20	1.62	2.04	2.89	4.97

Source: City of Ventura Water Shortage Event Contingency Plan, March 2015
a Base rates change with each fiscal year based on City Council approved rates.

8.5 Mechanism to Determine Reductions in Water Use

Specific methods to evaluate effectiveness of water conservation programs to be employed by the City are:

- Monitoring of Metered Water Usage – This will determine how much has been used. Compiling statistics to track usage of customer groups to determine trends is currently being done through the Ventura Water billing system. Meter readings/billings can be compared and analyzed to determine the effectiveness of conservation for all customer classes.

- Monitoring Production Quantities – In normal water supply conditions, production figures are recorded daily. The Water Production Supervisor and the Production Lead worker monitor the accuracy of the monthly production totals. The totals are incorporated into monthly water supply reports.

To verify that conservation reduction goals are being met, production and metered usage reports will be provided to the Ventura Water General Manager and Water Utility Manager during each stage of the conservation period. Water production figures will be compared to previous year production figures for the same time period to ascertain if conservation goals are being reached. Results will be posted on the Ventura Water website.

8.6 Revenue Impacts of Reduced Sales

Consumption reduction will impact revenues by decreasing the amount of water sold to customers. Water shortages may also impact construction activities. A reduction in construction activities will reduce water service connection fees collected by the City.

As consumption decreases, some expenditures are expected to increase. Staff costs for community education, enforcement of ordinances, monitoring and evaluation of water use, drought planning, and dealing with customer questions and complaints are expected to rise. Operations and maintenance costs may also increase because of the need to identify and quickly repair all water losses. A shift to alternative sources would change pumping, purchase, and treatment costs as different water supplies incur different purchase, treatment, and distribution costs

A summary of impacts to revenues and expenses is provided in Table 8-4.

TABLE 8-4
REVENUE IMPACTS DURING SHORTAGE

Demand Reduction	Approximate Revenue Reduction ($ million)	% of approximate $21 million water base revenue
10%	$2.37 million	11%
20%	$4.57 million	22%
30%	$6.91 million	33%
40%	$9.49 million	45%
50%	$11.50 million	55%

Note:
Source: City of Ventura Water Shortage Event Contingency Plan, March 2015

Table 8-4 does not include the added expense if a conservation incentive program is implemented.

A reduction in water revenue could be mitigated substantially through deferral or avoidance of capital fund expenditures. This would meet short-term cash flow needs, although it should only be considered on a short-term basis.

The water purchases, utility costs and chemical costs are not a linear function of the water usage reduction. However, in order to provide an estimate of the cost savings, it is assumed that if there is a ten percent reduction in usage, there will also be a ten percent reduction in associated costs. It should also be noted that if the mandatory reductions are required from December through April the wastewater revenue will be impacted for the following fiscal year.

A summary of measures to overcome revenue and expenditure impacts is provided in Table 8-5.

TABLE 8-5
MEASURES TO OVERCOME REVENUE AND EXPENDITURE IMPACTS DURING SHORTAGE

Measure	Summary of Effects
Use of Reserve Funds	Use of reserves may provide short-term rate stabilization, but require delays in capital expenditures and rebuilding of reserves after the water shortage
Decrease Capital Expenditures	Delay major construction projects for facilities as well as upgrades and replacements
Shift Water Sources to Less Costly Supplies if Possible	Reduce costs associated purchase, treatment, and distribution of water
Rate Increases	Increase revenue

It should be noted that expenditure impacts could be reduced 2-10% during mandatory conservation efforts less than 50% because of the reduction in costs associated with the treatment and deliver of potable water. Ventura Water will use the water rate model to predict

the savings for the 10-50 percent water reductions. Rate adjustments could also be employed either solely or in conjunction with capital expenditure reductions.

8.7 Actions to Prepare For Catastrophic Interruption

A catastrophic interruption constitutes a proclamation of a water shortage and could be any event (either natural or man-made) that causes a water shortage severe enough to classify as either a Stage 4 or worse water supply shortage condition.

In order to prepare for catastrophic events, the City prepared an Emergency Response Plan (ERP) in accordance with other state and federal regulations. The purpose of this plan is to design actions necessary to minimize the impacts of supply interruptions due to catastrophic events.

The ERP includes Ventura Water's standardized response and recovery procedures to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin such as an earthquake, extended power outage, fire, biological or chemical contamination, and explosion.

The plan takes into account the various aspects of the City's Water System Protection Program pertaining to potential malevolent threats or terrorism. The information contained in the ERP is intended to guide staff and inform other emergency responding agencies and includes plans, procedures, lists, and identification of equipment, emergency contacts, etc.

In Addition, the City's 2011 Water Master Plan analyzes seven different operational outage scenarios and provides an analysis of system impacts as well as long-term system improvements required to mitigate these impacts.

In a disaster, prior notice of water restrictions may not be possible; notice will be provided by other means. Appeals shall be processed as set forth in the established Water Waste Ordinance.

8.8 Minimum Water Supply Available During Next Three Years

The primary factor in limiting the City's existing water supplies is drought. In evaluating a three year worst-case water supply scenario, the City assumed that severe drought conditions (limited rain and above-average temperatures) would begin immediately and continue for three consecutive years (Table 8-6). The minimum water supply available during the next three years would occur during a three-year multiple-dry year event between the years 2016 and 2018. Since 2015 was the driest year on record, it is assumed the minimum supply for 2016, 2017, and 2018 for Ventura River (Foster Park) will be a repeat of what happened in 2015. Also, because of the complexities of the City's water sources, the specific numbers are only approximations.

TABLE 8-6
ESTIMATE OF MINIMUM SUPPLY FOR THE NEXT THREE YEARS

Source	Supply (AF) 2016	2017	2018
Casitas Municipal Water District [a]	4,093	4,093	4,093
Mound Basin [b]	4,000	4,000	4,000
Oxnard Plain Basin [b]	3,862	3,862	3,862
Santa Paula Basin [b]	1,147	1,147	1,147
Ventura River (Foster Park) [c]	1,298	1,298	1,298
Recycled Water [a]	700	700	700
Total Supplies	15,100	15,100	15,100

Notes:

a Final 2016 Comprehensive Water Resources Report, Table 4-2

b See Table 3-4. Single dry year value is used for Mound Basin due to limited facilities at this time.

c Based on water production for year 2015

References

California Department of Water Resources (DWR), October 2014. California Water Plan Update 2013

California Department of Water Resources (DWR). 2006. Progress on Incorporating Climate Change into Management of California's Water Resources. July.

California Department of Water Resources (DWR).2003. California's Groundwater, Bulletin 118 Update 2003. October.

California Irrigation Management System (CIMIS) data provided from Station No. 156, Central Coast Valleys region, June 2001 to February 2016. Available at: http://wwwcimis.water.ca.gov/cimis/welcome.jsp

City of San Buenaventura. 2016. Comprehensive Water Resources Report. May.

City of San Buenaventura. 2015. City of Ventura Water Shortage Event Contingency Plan. March.

City of San Buenaventura. 2015. 2015 Drinking Water Consumer Confidence Report. May.

City of San Buenaventura. 2014. Amended Estuary Special Studies Phase 2: Facilities Planning Study for Expanding Recycled Water Delivery Final Report. May.

City of San Buenaventura. 2013. Facilities Planning Study for Expanding Recycled Water Delivery. March.

City of San Buenaventura. 2011. Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary. March.

City of San Buenaventura. 2010. Phase 1 Recycled Water Market Study. March.

City of San Buenaventura. 2010. Treatment Wetlands Study. March

Fugro West, Inc. June 1997. "Mound Groundwater Basin Annual Report

Kennedy/Jenks Consultants, June 2011. 2010 Urban Water Management Plan for the City of Ventura, Ventura Water.

RBF Consulting, March 2011. City of San Buenaventura Water Master Plan

Ventura County Watershed Protection District, Station 66E, October 2000 to September 2015. Available at: www.countyofventura.org

Western Regional Climate Center, Station 049285. Available at: www.wrcc.dri.edu

City of Ventura

Photo By: Mary Meyer (2011)